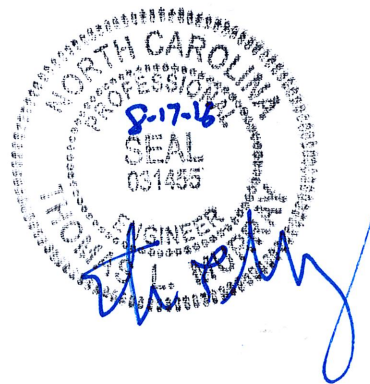


---

## List of Appendices

|            |  |
|------------|--|
| Appendix A | Hydrologic Analysis                                |
| Appendix B | Hydraulic Analysis                                 |
| Appendix C | Watershed Map, Land Use Map, and Soils Map         |
| Appendix D | Citizen Input                                      |
| Appendix E | SCS Hydrologic Input Data                          |
| Appendix F | Time of Concentration Calculations                 |
| Appendix G | Preliminary Opinion of Probable Construction Costs |
| Appendix H | Hydraulic and Hydrologic Input and Output          |
| Appendix I | BMP Conceptual Design and Nutrient Calculations    |
| Appendix J | Digital Copy of Hydraulic and Hydrologic Models    |
| Appendix K | Stream Assessment                                  |
| Appendix L | Prioritization Matrix                              |



---

## **Appendix A:**

### **Hydrologic Analysis**

## APPENDIX A

### HYDROLOGIC ANALYSIS

---

Three different models were used to develop design flows for the primary and secondary systems. For each system analyzed, the hydrologic model(s) was selected based on the complexity of the stormwater conveyance system.

The US Army Corps of Engineers (USACE) HEC-HMS model was selected to model the primary systems defined as the main stems of Fork Swamp, FSUT1, FSUT2R1, FSUT2R2, and FSUT3. HEC-HMS simulates the surface runoff response to precipitation for an interconnected system of surfaces, channels, and ponds. Input data for the HEC-HMS model was developed using topographic, land use, and soils maps in GIS to delineate and calculate the basin areas and SCS hydrologic parameters. The HEC-HMS model offers a variety of methods for simulating the rainfall-runoff response, hydrograph development, channel and pond routing. The selection of methods for the analyses is based on the study objectives, data availability, and watershed characteristics. The precipitation data for the 24-hour duration, NRCS Type III storm was used to represent the synthetic rainfall event. The NRCS curve number approach was selected to calculate runoff volumes from the precipitation data, and the sub-basin unit hydrographs for these flood volumes were developed using the NRCS lag times. Where appropriate, reservoir routing was selected to model attenuation behind culvert embankments.

For the secondary systems that may: (a) have significant backwater effects from rising water surface elevations within the Primary Systems, (b) have attenuation within drainage ditches or behind roadways, and (c) show a sensitivity to the timing response of runoff to rainfall, the Storm Water Management Model (SWMM) developed by the Environmental Protection Agency (EPA) was selected as the hydrologic and hydraulic model. The NRCS curve number approach was selected to calculate runoff volumes from the precipitation data, and the sub-basin unit hydrographs for these flood volumes were developed using the watershed width parameter. SWMM simulates the surface runoff response to precipitation for an interconnected system of surfaces, channels, and ponds. Input data for the SWMM model was developed using topographic data, land use data, and soils maps in GIS to delineate and calculate the basin areas and NRCS hydrologic parameters. The SWMM model offers a variety of methods for simulating the rainfall-runoff response, hydrograph development, and channel routing. One advantage to using SWMM to model both hydrology and hydraulics is that channel routing is modeled in the EXTRAN (hydraulics) block automatically based on the geometry and nature of the conveyance system. This eliminates the need to iterate between a hydrologic model and a hydraulic model to produce reasonable flows.

Some project areas with smaller drainage areas and less complex conveyance systems required a less rigorous approach. Hydraflow Storm Sewers, an extension of AutoCAD Civil

# APPENDIX A

## HYDROLOGIC ANALYSIS

3D, was used to generate peak flows using the Rational Method. Table A-1 lists the different systems and the modeling methodology applied to each system.

**Table A-1: Project Area Model Selection**

| Project Area                  | Model Selection        |
|-------------------------------|------------------------|
| Fork Swamp Primary System     | HEC-HMS                |
| FSUT1 Primary System          | HEC-HMS                |
| FSUT2R1 Primary System        | HEC-HMS                |
| FSUT2R2 Primary System        | HEC-HMS                |
| FSUT3 Primary System          | HEC-HMS                |
| Trafalgar Drive Closed System | Hydraflow Storm Sewers |
| Corey Road Closed System      | SWMM                   |
| Lynndale System               | Done by others         |
| Evans Street Channels         | HEC-HMS                |

### Watershed Delineation and Connectivity

Watersheds were delineated for the Primary Systems and for each of the four (4) secondary systems utilizing digital LiDAR data available from the State of North Carolina and the stormwater inventory. The preliminary watersheds were created using automated procedures in a GIS platform and then adjusted as necessary based on the conveyance system and known ridge lines. Each flood control project watershed for the Primary Systems was subdivided into sub-watersheds selected at hydrologically and hydraulically significant points, such as major roadway crossings, stream convergences, known problem areas, etc. Each sub-watershed for the secondary systems was selected as the area that drained to each inlet modeled on the secondary system. Seventy-four (74) sub-watersheds were delineated for the Primary Systems ranging in size from 20 to 290 acres. Sub-watersheds were delineated as necessary for the secondary systems to accurately model the hydraulics of the system. The watershed maps included in Appendix C illustrate the sub-watershed and hydrologic connectivity for the primary system.

### Soils

The NRCS curve number method uses basin characteristics, such as soil types and land use, to compute the runoff response. The infiltration rate of a soil influences the volume of surface runoff that results from given storm events. Soils with high infiltration rates produce lower runoff than soils with lower infiltration rates. The Soil Conservation Service has prepared soil maps for Pitt County that identify four primary soil groups. This data is available digitally and was obtained for the City of Greenville.

The groups (A, B, C, and D) correspond to decreasing rates of infiltration. A general description of the four soil groups taken from the USDA, SCS, NEH-4 (1972) is presented in Table A-2.

## APPENDIX A

### HYDROLOGIC ANALYSIS

**Table A-2: Hydrologic Soils Groups**

| Soil Group        | Description  |
|-------------------|--|
| A                 | Group A soils have high infiltration rates even when thoroughly wetted and consist chiefly of deep, well to excessively drained sand or gravels. These soils have a high rate of water transmission. (greater than 0.3 inches per hour)  |
| B                 | Group B soils have moderate infiltration rates even when thoroughly wetted and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse texture. These soils have a moderate rate of water transmission. (0.15 to 0.3 inches per hour)  |
| C                 | Group C soils have slow infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission. (0.5 to 0.15 inches per hour)  |
| D                 | Group D soils have a very slow infiltration rate when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission. (0 to 0.05 inches per hour) |
| A/D<br>B/D<br>C/D | The first letter applies to the drained condition and the second to the undrained condition. For the purpose of hydrologic soil group, adequately drained means that the seasonal high water table is kept at least 60 centimeters (24 inches) below the surface.  |

Soils within the watershed are predominantly NRCS hydrologic soil groups A and C soils, although seven (7) different hydrologic soil groups are represented in some quantity in the Fork Swamp watershed (See Table A-3 and Appendix C).

**Table A-3: Area Distribution of Hydrologic Soil Groups**

| Soil Group | Total Area (acre) | Percent of Total Area |
|------------|-------------------|-----------------------|
| A          | 141               | 2.1%                  |
| B          | 1,071             | 15.7%                 |
| C          | 2,333             | 34.3%                 |
| D          | 1,332             | 19.6%                 |
| A/D        | 41                | 0.6%                  |
| B/D        | 1,875             | 27.6%                 |
| C/D        | 11                | 0.2%                  |

## APPENDIX A

### HYDROLOGIC ANALYSIS

---

#### Land Use

Land use is the watershed cover condition as it relates to the actual type of development and zoning within the watershed. Land use influences the runoff characteristics of a watershed, and combined with other basin characteristics, is used to determine the SCS curve number for the basin.

The existing zoned land uses for the Fork Swamp Watershed were provided by the City of Greenville. These zoning maps were used to develop peak flows for the watershed. Eleven (11) land use categories were delineated within the Fork Swamp Watershed based on the information provided and field observation of the current uses (See Appendix C).

In its entirety, the Fork Swamp Watershed covers an area of 6,807 acres (10.6 square miles). Land use in the watershed is about 75 percent built out as shown on the Existing Conditions Land Use Map included in Appendix C. Percentages of each existing and future land use groups and the correlating acreage are listed in Table A-4 below.

**Table A-4: Fork Swamp Watershed Land Use**

| Land Use Category                 | Existing     |                       | Future       |                       |
|-----------------------------------|--------------|-----------------------|--------------|-----------------------|
|                                   | Area (acres) | Percent of Basin Area | Area (acres) | Percent of Basin Area |
| Right-of-Way                      | 733          | 11%                   | 733          | 11%                   |
| Industrial                        | 34           | 0.5%                  | 32           | 0.5%                  |
| Commercial                        | 659          | 10%                   | 452          | 7%                    |
| Mixed Use/Office/Institutional    | 40           | 1%                    | 29           | 0.4%                  |
| Office/Institutional/Medical      | 59           | 1%                    | 67           | 1%                    |
| Office/Institutional/Multi-Family | 336          | 5%                    | 293          | 4%                    |
| High Density Residential          | 875          | 13%                   | 508          | 7%                    |
| Medium Density Residential        | 1,254        | 18%                   | 1,149        | 17%                   |
| Low Density Residential           | 520          | 8%                    | 572          | 8%                    |
| Very Low Density Residential      | 2,011        | 30%                   | 905          | 13%                   |
| Conservation/Open Space           | 286          | 4%                    | 2,067        | 30%                   |

## APPENDIX A

### HYDROLOGIC ANALYSIS

---

#### NRCS Curve Numbers

The NRCS curve number approach was used in computing the runoff response. Runoff curve numbers (RCNs) were generated by using the NRCS document entitled Urban Hydrology for Small Watersheds, dated June 1986 and commonly referred to as TR-55. This method relates the drainage characteristics of the hydrologic soil group, land use category, and antecedent moisture conditions (AMC) to a runoff curve number. The runoff curve number and an estimate of the initial surface moisture storage capacity are used to calculate a total runoff depth for a storm in a basin.

The AMC refers to the total rainfall in a 5-day period preceding a storm and relates to the soil moisture condition at the beginning of the storm event. The AMC value can be used as a calibration tool in the hydrologic computations where AMC-1 represents "dry" conditions and AMC-3 represents "wet" conditions. The average antecedent moisture conditions (AMC-2) are generally considered most representative for the humid southeastern portion of the country and were used for the hydrologic calculations in this study.

Runoff curve numbers were determined for each sub-basin based on the soil group, land use, and average antecedent moisture condition for the area. The curve numbers calculated for this study are listed in Table A-5 below.

**Table A-5: Curve Numbers Based on Land Use and Soil Groups**

| Land Use Category                     | Soil Group |    |    |    |
|---------------------------------------|------------|----|----|----|
|                                       | A          | B  | C  | D  |
| Commercial                            | 89         | 92 | 94 | 95 |
| Conservation/Open Space/Agricultural* | 49         | 69 | 79 | 84 |
| Very Low Residential                  | 49         | 69 | 79 | 84 |
| Low Density Residential               | 51         | 68 | 79 | 84 |
| Medium Density Residential            | 54         | 70 | 80 | 85 |
| High Density Residential              | 61         | 75 | 83 | 87 |
| Office/Institutional/Multifamily      | 77         | 85 | 90 | 92 |
| Right-of-Way                          | 83         | 89 | 92 | 93 |

\*Assumed good condition

For each sub-basin, the curve number was determined and weighted by area to calculate the composite curve number for each sub-basin. A summary of the hydrologic input data for the Primary Systems, including the runoff curve numbers, is shown in Table A-6. The detailed calculations are included in Appendix E (runoff curve numbers) and Appendix F (times of concentration).

## APPENDIX A

### HYDROLOGIC ANALYSIS

**Table A-6: Summary of Hydrologic Input Data**

| <b>Drainage Basin ID</b> | <b>Drainage Area (acre)</b> | <b>Existing RCN</b> | <b>Future RCN</b> | <b>Lag Time* (minutes)</b> |
|--------------------------|-----------------------------|---------------------|-------------------|----------------------------|
| FS-1A                    | 76.2                        | 89                  | 89                | 45                         |
| FS-1B                    | 82.0                        | 85                  | 85                | 40                         |
| FS-2A                    | 99.5                        | 80                  | 80                | 84                         |
| FS-2B                    | 48.7                        | 85                  | 85                | 46                         |
| FS-3                     | 53.6                        | 82                  | 82                | 80                         |
| FS-4A                    | 63.1                        | 83                  | 83                | 56                         |
| FS-4B                    | 75.3                        | 86                  | 86                | 23                         |
| FS-5                     | 33.0                        | 78                  | 90                | 23                         |
| FS-6A                    | 103.9                       | 85                  | 87                | 94                         |
| FS-6B                    | 58.0                        | 77                  | 77                | 142                        |
| FS-6C                    | 96.3                        | 80                  | 83                | 144                        |
| FS-6D                    | 63.2                        | 80                  | 80                | 153                        |
| FS-6E                    | 67.9                        | 76                  | 80                | 108                        |
| FS-6F                    | 105.8                       | 79                  | 82                | 203                        |
| FS-7A                    | 94.7                        | 82                  | 82                | 106                        |
| FS-7B                    | 96.9                        | 75                  | 80                | 92                         |
| FS-8A                    | 41.0                        | 78                  | 78                | 76                         |
| FS-8B                    | 80.3                        | 76                  | 76                | 83                         |
| FS-8C                    | 60.5                        | 79                  | 81                | 41                         |
| FS-8D                    | 44.5                        | 74                  | 74                | 49                         |
| FS-8E                    | 78.4                        | 71                  | 72                | 34                         |
| FS-9                     | 89.2                        | 68                  | 73                | 79                         |
| FS-10A                   | 21.5                        | 81                  | 81                | 64                         |
| FS-10B                   | 98.0                        | 72                  | 72                | 60                         |
| FS-10C                   | 65.5                        | 74                  | 75                | 98                         |
| FS-10D                   | 115.7                       | 79                  | 79                | 101                        |
| FS-10E                   | 42.0                        | 74                  | 76                | 29                         |
| FS-10F                   | 98.4                        | 66                  | 71                | 36                         |
| FSUT1-1A                 | 257.7                       | 75                  | 79                | 166                        |
| FSUT1-1B                 | 252.2                       | 80                  | 81                | 82                         |
| FSUT1-1C                 | 171.9                       | 73                  | 79                | 63                         |
| FSUT1-2A                 | 289.4                       | 70                  | 76                | 159                        |
| FSUT1-2B                 | 153.6                       | 76                  | 80                | 176                        |
| FSUT1-2C                 | 71.1                        | 73                  | 73                | 120                        |
| FSUT1-2D                 | 114.0                       | 77                  | 79                | 175                        |
| FSUT1-2E                 | 106.3                       | 78                  | 80                | 59                         |
| FSUT1-2F                 | 67.7                        | 74                  | 80                | 28                         |
| FSUT1-2G                 | 58.2                        | 84                  | 84                | 25                         |
| FSUT1-3                  | 119.9                       | 66                  | 71                | 27                         |
| FSUT2-1                  | 86.9                        | 77                  | 80                | 37                         |
| FSUT2-2                  | 20.0                        | 75                  | 80                | 24                         |



## APPENDIX A

### HYDROLOGIC ANALYSIS

| Drainage Basin ID | Drainage Area (acre) | Existing RCN | Future RCN | Lag Time* (minutes) |
|-------------------|----------------------|--------------|------------|---------------------|
| FSUT2-3           | 137.5                | 72           | 79         | 48                  |
| FSUT2-4           | 88.7                 | 81           | 88         | 152                 |
| FSUT2-5           | 136.3                | 80           | 87         | 101                 |
| FSUT2-6           | 199.9                | 82           | 87         | 100                 |
| FSUT2-7A          | 124.6                | 76           | 79         | 52                  |
| FSUT2-7B          | 269.1                | 76           | 78         | 34                  |
| FSUT2-8A          | 173.5                | 79           | 80         | 300                 |
| FSUT2-8B          | 36.7                 | 82           | 82         | 20                  |
| FSUT2-9A          | 62.7                 | 78           | 78         | 16                  |
| FSUT2-9B          | 71.6                 | 78           | 79         | 15                  |
| FSUT3-1A          | 66.9                 | 86           | 86         | 36                  |
| FSUT3-1B          | 60.8                 | 79           | 79         | 37                  |
| FSUT3-1C          | 58.0                 | 73           | 73         | 57                  |
| FSUT3-1D          | 105.4                | 82           | 84         | 57                  |
| FSUT3-1E          | 24.3                 | 72           | 73         | 38                  |
| FSUT3-2A          | 53.5                 | 65           | 72         | 95                  |
| FSUT3-2B          | 71.2                 | 71           | 73         | 93                  |
| FSUT3-3           | 58.2                 | 78           | 79         | 200                 |
| FSUT3-4A          | 42.9                 | 80           | 82         | 89                  |
| FSUT3-4B          | 43.3                 | 87           | 88         | 53                  |
| FSUT3-4C          | 84.2                 | 77           | 83         | 58                  |
| FSUT3-4D          | 54.0                 | 85           | 85         | 52                  |
| FSUT3-5           | 100.8                | 86           | 87         | 21                  |
| FSUT3-6           | 69.9                 | 75           | 89         | 20                  |
| FSUT3-7           | 90.8                 | 81           | 84         | 96                  |
| FSUT3-8           | 49.9                 | 77           | 77         | 220                 |
| FSUT3-9A          | 33.5                 | 84           | 84         | 60                  |
| FSUT3-9B          | 105.2                | 76           | 81         | 150                 |
| FSUT3-9C          | 101.9                | 80           | 80         | 33                  |
| FSUT3-9D          | 56.1                 | 83           | 84         | 48                  |
| FSUT3-10A         | 156.7                | 76           | 79         | 122                 |
| FSUT3-10B         | 56.0                 | 85           | 85         | 63                  |
| FSUT3-10C         | 139.2                | 71           | 74         | 51                  |

\*Lag time = 0.6x Time of Concentration

#### Rainfall

Rainfall distributions for Greenville are derived using the NRCS Type III standard distribution. Total rainfall volumes for the modeled frequency storms were based on data published on the NOAA website, [http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc_pfds.html). Table A-7 shows the total rainfall volumes used for this study based on precipitation data collected in Greenville, North Carolina

## APPENDIX A

### HYDROLOGIC ANALYSIS

---

**Table A-7: Design Storm Rainfall Depths**

| Design Storm      | Rainfall Depth (in) |
|-------------------|---------------------|
| 2-year, 24-hour   | 3.76                |
| 10-year, 24-hour  | 5.81                |
| 25-year, 24-hour  | 7.23                |
| 50-year, 24-hour  | 8.47                |
| 100-year, 24-hour | 9.84                |

While the depth-duration-frequency curves are calculated based on real rainfall data, the rainfall data used for the SWMM and HEC-HMS models represent the Type III synthetic rainfall distribution. Actual runoff is based on several factors including rainfall intensity, duration and the antecedent moisture conditions of the watershed.

#### Hydrograph Translation

The lag time, as defined by the NRCS for use in the NRCS dimensionless unit hydrograph method, is the time, or lag, between the center of mass of rainfall excess and the peak of the unit hydrograph. The lag time is based on the sub-watershed time of concentration, or travel time, and is a function of the sub-watershed size, shape, slope, cover, and other basin characteristics. For the NRCS method, the sub-watershed lag time is calculated to be 0.6 times the time of concentration for each sub-watershed.

The times of concentration for the sub-watersheds were calculated from the methodology described in TR-55. A summary of the calculations is shown in Appendix F. The longest flow path is divided into three types of flow; overland flow, shallow concentrated flow, and channel flow. A spreadsheet was developed to tabulate the incremental travel times for each type of flow for each sub-basin. The incremental travel times were totaled and multiplied by 0.6 to compute the lag time for each sub-basin. The equation detailing the travel time for sheet flow is as follows:

$$T_t = \frac{.007 (nL)^{0.8}}{(P_2)^{0.5} S^{0.4}}$$

- T<sub>t</sub> = Travel Time in hours
- n = Manning Roughness Coefficient (Paved=0.011, Unpaved=0.24)
- L = flow length in feet
- P<sub>2</sub> = 2-year, 24 hour rainfall = 3.76 inches
- S = slope of hydraulic grade line (land slope in ft/ft)

## APPENDIX A

### HYDROLOGIC ANALYSIS

---

For shallow concentrated flow, the velocity (V) is calculated for either paved or unpaved sections by using the following equations:

$$\text{Unpaved } V = 16.1345 (S)^{1/2}$$

$$\text{Paved } V = 20.3282 (S)^{1/2}$$

The travel time for shallow flow is then calculated by dividing the flow length (L in feet) by velocity as follows:

$$T_t = \text{Travel Time} = L / (3600 * V)$$

The open channel travel times are determined by a modified version of the Manning equation, which is as follows:

$$V = \frac{1.49 R^{2/3} S^{0.5}}{n}$$

- V = Average full-flow velocity (ft/s)
- R = Hydraulic radius (ft)
- S = Slope of hydraulic grade line (ft/ft)
- n = Manning roughness coefficient

Instead of a time of concentration parameter, the SWMM model uses a watershed width parameter to create the unit hydrograph used in the model that will translate the rainfall into runoff. The watershed width is a parameter unique to SWMM that typically represents the watershed area divided by the longest flow path. The width parameter is typically calibrated to flow gauge data, if available. The Fork Swamp Watershed lacks flow gauge data, so the peak flows from SWMM were compared to flows developed using the Rational Method. Based on the flow comparison, the watershed widths for each basin were increased in some instances to produce reasonable flows. Increasing the watershed width parameters is not an uncommon practice for calibrating models for areas with gradual slopes and moderate conveyance systems.

#### **Channel Elements**

Flood peaks attenuate, or reduce, as they travel downstream due to the storage characteristic of the stream reach. The Muskingum-Cunge routing method in HEC-HMS was selected to define the storage characteristic of selected stream reaches in the Fork Swamp Watershed. It can be described as a hydrologic routing method based on physical parameters of the channel and floodplain. Input data for this method consists of representative channel/floodplain sections, reach length, Manning's roughness coefficient, and channel bed

slope. This method provides advantages over other hydrologic techniques based on the relative size and slope of the channels and floodplains in the watershed.

### **Structure and Pond Routing**

Reservoir storage routing was used for routing hydrographs through the storage areas upstream from undersized structures (culverts). HEC-HMS is able to model the effects of an undersized culvert through inputs defining the relationship between water volume or area and elevation and the relationship between outflow and water surface elevations. The relationship between outflow and water surface elevations is developed using an iterative process between HEC-HMS and HEC-RAS. A rating curve generated using HEC-RAS defines the outflow of the water leaving this system.

Structures having fill heights greater than or equal to 50% of the height of the structure were assumed to provide significant peak flow attenuation and, therefore, were routed in the HEC-HMS model. In addition, any structure which exhibited significant upstream floodplain storage or significant backwater from the HEC-RAS model output would be analyzed for providing peak flow attenuation.

For each structure, the cutoff point in the backwater pool was determined where the structure routing ends and upstream channel routing begins. This determination was necessary so that available storage areas calculated for channel and structure routing did not overlap. The following procedure was used for this determination:

- The approximate limit of the 100-year frequency flood backwater pool was delineated in the topographic map.
- The distance from the upstream face of the structure to the upstream limit of the pool was measured.
- From the upstream end of the backwater pool, a distance equal to 20% of the total pool length was measured in the downstream direction and the point marked on the topographic map.
- Through this point a line was drawn perpendicular to the contour lines.
- This line was then designated as the cutoff point to be used as the upstream limit of the channel routing.

For each structure, the elevation-storage relation for the Modified Puls method was derived by calculating the surface area of the topographic contours from the upstream face of the structure to the routing cutoff point associated with the structure. A pair of "SA" (storage area) – "SE" (elevation) records, the elevation-storage relation for each structure was input from the delineated information. To avoid interpolating storage areas for each stage-discharge point, a separate stage-discharge relation was entered into the HEC-HMS model

## APPENDIX A

### HYDROLOGIC ANALYSIS

on a pair of “SQ” (discharge) – “SE” (elevation) records based on the HEC-RAS model output.

However, the method described in the previous paragraph does not account for the reduction in tailwater on the structure due to the attenuation effects of the upstream storage, which in turn can affect the stage-discharge relation of the structure. Therefore, an iterative process for storage structures was followed with an objective to obtain a set of peak discharge values, runoff volumes, and water surface elevations that are “balanced” between the two models. The process was initiated by inputting a set of discharges into the HEC-RAS model to develop a set of discharge-storage relations for each reach. This initial set of relations was input into the HEC-HMS model. These values were supplemented by the depth-storage relation for each structure.

The HEC-HMS model was run with these values to derive new discharges at downstream locations. These new values were input into the HEC-RAS model and it was recomputed. The new discharges and water surface elevations listed in the HEC-HMS summary output were compared with the discharges listed in the previous HEC-RAS run. When the values stabilized, the model was considered “balanced”. If not then additional iterations were performed. Typically, three iterations are adequate to derive a balanced model.

#### Summary of Hydrologic Model Results

The HEC-HMS model was used to compute peak runoff for the 2-, 10-, 25-, 50- and 100- year design storms for the existing conditions.

The results of the hydrologic model are summarized in Table A-8. The HEC-HMS input and output are included in Appendix H. Additionally, a CD is included in Appendix J and contains the digital files for the HEC-HMS model.

**Table A-8: Existing Conditions Flows from HEC-HMS for Fork Swamp Watershed**

| HEC-HMS Node               | Road Name / Location               | HEC-RAS Station | Storm Event  |               |               |               |                |
|----------------------------|------------------------------------|-----------------|--------------|---------------|---------------|---------------|----------------|
|                            |                                    |                 | 2-year (cfs) | 10-year (cfs) | 25-year (cfs) | 50-year (cfs) | 100-year (cfs) |
| <b>FORK SWAMP</b>          |                                    |                 |              |               |               |               |                |
| East Baywood Lane          | East Baywood Lane                  | 55891           | 188          | 352           | 468           | 569           | 681            |
| Railroad                   | Railroad                           | 55592           | 251          | 475           | 629           | 765           | 916            |
| Evans Street               | Evans Street                       | 54609           | 256          | 486           | 642           | 784           | 937            |
| E Fire Tower Road (Bridge) | East Fire Tower Road               | 50168           | 438          | 844           | 1,138         | 1,395         | 1,681          |
| ADD FSUT3 to FS            | Confluence of FSUT3 and Fork Swamp | 46863           | 538          | 1,055         | 1,414         | 1,756         | 2,122          |

## APPENDIX A

### HYDROLOGIC ANALYSIS

|                              |   |               |     |       |       |       |       |
|------------------------------|---|---------------|-----|-------|-------|-------|-------|
| ADD FSUT2                    | Confluence of FSUT2 and Fork Swamp              | 44420         | 757 | 1,477 | 2,003 | 2,486 | 3,052 |
| ADD FSUT1                    | Confluence of FSUT1 and Fork Swamp              | 43230         | 963 | 1,937 | 2,637 | 3,288 | 4,025 |
| <b>FORK SWAMP UT1</b>        |   |               |     |       |       |       |       |
| U/S Limit FSUT1              | Upstream Limit of FSUT1/Trafalgar Drive – South | 5103          | 107 | 223   | 309   | 387   | 474   |
| Trafalgar Drive              | Trafalgar Drive – North                         | 4235          | 111 | 231   | 319   | 399   | 490   |
| Corey Road – FSUT1           | Corey Road                                      | 3380          | 195 | 410   | 577   | 719   | 897   |
| <b>FORK SWAMP UT2R1</b>      |   |               |     |       |       |       |       |
| ADD FSUT2-7B                 | Old Tar Road                                    | 3499          | 215 | 439   | 604   | 752   | 914   |
| <b>FORK SWAMP UT2R2</b>      |   |               |     |       |       |       |       |
| U/S Limit FSUT2              | Upstream Limit of FSUT2                         | 4262          | 49  | 90    | 118   | 143   | 171   |
| West Fire Tower              | West Fire Tower Road                            | 303           | 99  | 201   | 276   | 343   | 419   |
| <b>FORK SWAMP UT3</b>        |   |               |     |       |       |       |       |
| U/S Limit FSUT3              | Upstream Limit of FSUT3                         | 4360          | 108 | 213   | 290   | 358   | 434   |
| Coleman Drive                | Coleman Drive                                   | 289           | 141 | 290   | 401   | 500   | 612   |
| County Home                  | County Home Road                                | 10420         | 62  | 113   | 148   | 178   | 211   |
| East Fire Tower Road – North | East Fire Tower Road – U/S                      | 8790          | 89  | 163   | 202   | 250   | 295   |
| Wimbledon Drive              | Wimbledon Drive                                 | 8238          | 142 | 260   | 331   | 409   | 486   |
| Tower Pl – Summerhaven Dr    | Tower Place/ Summerhaven Drive                  | 7694/<br>7287 | 159 | 302   | 392   | 487   | 583   |
| East Fire Tower Road - South | East Fire Tower Road – D/S                      | 5065          | 308 | 610   | 810   | 1,012 | 1,220 |

#### Comparison of Peak Flows

For comparison purposes, flood peaks were estimated using the U.S. Geological Survey (USGS) publication entitled "The National Flood-Frequency Program – Methods for Estimating Flood Magnitude and Frequency in Rural and Urban Areas in North Carolina – USGS Fact Sheet 007-00" (2001) at key locations within the watershed. Table A-9 compares the peak flows determined from the USGS regional regression equations the Coastal-Plain

## APPENDIX A

### HYDROLOGIC ANALYSIS

region versus the peak flows from HEC-HMS. Additionally, the peak flows from HEC-HMS were also compared to available FEMA flows.

**Table A-9: Comparison of Existing Conditions Peak Flows**

| Methodology   | Location                | 2-Year (cfs) | 10-Year (cfs) | 25-Year (cfs) | 50-Year (cfs) | 100-Year (cfs) |
|---|-------------------------|--------------|---------------|---------------|---------------|----------------|
| <b>Comparison of Existing Conditions Peak Flows – FORK SWAMP</b>  |                         |              |               |               |               |                |
| HEC-HMS   | East Baywood Lane       | 188          | 352           | 468           | 569           | 681            |
|   | Railroad                | 251          | 475           | 629           | 765           | 916            |
|   | Evans Street            | 256          | 486           | 642           | 784           | 937            |
|   | East Fire Tower Road    | 438          | 844           | 1,138         | 1,395         | 1,681          |
| USGS – Regional Regression Equations: Urban Coastal Plains (2001) | East Baywood Lane       | 204          | 475           | 710           | 830           | 946            |
|   | Railroad                | 257          | 582           | 854           | 995           | 1131           |
|   | Evans Street            | 270          | 606           | 886           | 1032          | 1171           |
|   | East Fire Tower Road    | 439          | 934           | 1,322         | 1,534         | 1,736          |
| FEMA Flows  | East Baywood Lane       | -            | 414           | -             | 762           | 886            |
|   | Railroad                | -            | 414           | -             | 762           | 886            |
|   | Evans Street            | -            | 414           | -             | 762           | 886            |
|   | East Fire Tower Road    | -            | 697           | -             | 1,231         | 1,427          |
| <b>Comparison of Existing Conditions Peak Flows – FSUT1</b>       |                         |              |               |               |               |                |
| HEC-HMS   | Trafalgar Drive - South | 107          | 223           | 309           | 387           | 474            |
|   | Trafalgar Drive - North | 111          | 231           | 319           | 399           | 490            |
|   | Corey Road              | 195          | 410           | 577           | 719           | 897            |
| USGS – Regional Regression Equations: Urban Coastal Plains (2001) | Trafalgar Drive - South | 181          | 459           | 707           | 850           | 993            |
|   | Trafalgar Drive - North | 234          | 559           | 840           | 996           | 1151           |
|   | Corey Road              | 586          | 1218          | 1695          | 1967          | 2227           |
| <b>Comparison of Existing Conditions Peak Flows – FSUT2R1</b>     |                         |              |               |               |               |                |
| HEC-HMS   | Old Tar Road            | 215          | 439           | 604           | 752           | 914            |
| USGS – Regional Regression Equations: Urban Coastal Plains (2001) | Old Tar Road            | 507          | 1,046         | 1,458         | 1,680         | 1,889          |
| FEMA Flows  | Old Tar Road            | -            | 296           | -             | 631           | 833            |
| <b>Comparison of Existing Conditions Peak Flows – FSUT2R2</b>     |                         |              |               |               |               |                |
| HEC-HMS   | West Fire Tower Road    | 99           | 201           | 276           | 343           | 419            |

## APPENDIX A

### HYDROLOGIC ANALYSIS

|  |                                     |     |      |      |       |       |
|--|-------------------------------------|-----|------|------|-------|-------|
| USGS – Regional<br>Regression Equations:<br>Urban Coastal Plains<br>(2001) | West Fire Tower Road                | 168 | 420  | 647  | 771   | 896   |
| <b>Comparison of Existing Conditions Peak Flows – FSUT3</b>                |                                     |     |      |      |       |       |
| HEC-HMS  | Coleman Drive                       | 141 | 290  | 401  | 500   | 612   |
|  | County Home Road                    | 62  | 113  | 148  | 178   | 211   |
|  | East Fire Tower - U/S               | 89  | 163  | 202  | 250   | 295   |
|  | Wimbledon Drive                     | 142 | 260  | 331  | 409   | 486   |
|  | Tower<br>Place/Summerhaven<br>Drive | 159 | 302  | 392  | 487   | 583   |
|  | East Fire Tower - D/S               | 308 | 610  | 810  | 1,012 | 1,220 |
| USGS – Regional<br>Regression Equations:<br>Urban Coastal Plains<br>(2001) | Coleman Drive                       | 232 | 538  | 799  | 937   | 1070  |
|  | County Home Road                    | 89  | 230  | 364  | 430   | 495   |
|  | East Fire Tower - U/S               | 130 | 319  | 491  | 577   | 660   |
|  | Wimbledon Drive                     | 218 | 503  | 748  | 874   | 996   |
|  | Tower<br>Place/Summerhaven<br>Drive | 277 | 613  | 892  | 1035  | 1169  |
|  | East Fire Tower - D/S               | 557 | 1103 | 1513 | 1,723 | 1,915 |
| FEMA Flows   | Coleman Drive                       | -   | -    | -    | -     | -     |
|  | County Home Road                    | -   | -    | -    | -     | -     |
|  | East Fire Tower - U/S               | -   | -    | -    | -     | -     |
|  | Wimbledon Drive                     | -   | -    | -    | -     | -     |
|  | Tower<br>Place/Summerhaven<br>Drive | -   | -    | -    | -     | -     |
|  | East Fire Tower - D/S               | -   | 303  | -    | 643   | 850   |



---

## **Appendix B:**

### **Hydraulic Analysis**

---

## APPENDIX B

### HYDRAULIC ANALYSIS

---

The purpose of the hydraulic modeling analysis is to determine an existing level of flooding for the stormwater drainage network and to develop proposed solutions to mitigate flooding, on both the primary systems and the secondary systems. Three different modeling methodologies were used depending on the complexity and location of the conveyance system. For the primary systems comprised of Fork Swamp, FSUT1, FSUT2R1, FSUT2R2, and FSUT3, the Hydrologic Engineering Center River Analysis System (HEC-RAS) was used for hydraulic modeling. For smaller less complex secondary systems, Hydraflow Storm Sewers was used to calculate the hydraulic grade lines using an energy grade based approach, while more complex secondary systems were modeled using SWMM. Table B-1 lists the project areas that were modeled using each approach.

**Table B-1: Project Area Model Selection**

| <b>Project Area</b>           | <b>Model Selection</b> |
|-------------------------------|------------------------|
| Fork Swamp Primary System     | HEC-RAS                |
| FSUT1 Primary System          | HEC-RAS                |
| FSUT2R1 Primary System        | HEC-RAS                |
| FSUT2R2 Primary System        | HEC-RAS                |
| FSUT3 Primary System          | HEC-RAS                |
| Trafalgar Drive Closed System | Hydraflow Storm Sewers |
| Corey Road Closed System      | SWMM                   |
| Lynndale System               | Done by others         |
| Evans Street Channels         | HEC-RAS                |

#### **HEC-RAS Model**

The HEC-RAS model calculates water surface profiles for steady, gradually varied flow, both sub-critical and supercritical, for user-specified discharges. The standard step backwater analysis for sub-critical flow was modeled for the Fork Swamp, FSUT1, FSUT2R1, FSUT2R2, and FSUT3 Primary Systems. The model calculates the effect of obstructions, such as culverts, and building structures in the channel and floodplain on the water surface profile. The hydraulic computations are based on the solution of a one-dimensional energy equation with energy loss due to friction evaluated by Manning's equation.

Input data for the HEC-RAS computer model includes the following:

- Cross-section geometry of the channel and floodplain.
- Roughness coefficients to describe the characteristics of the channel and floodplain.
- Size, shape, and characteristics of culverts and roadways along the stream reach.
- Energy loss coefficients for flow in the channel and at roadway crossings.

## APPENDIX B

### HYDRAULIC ANALYSIS

---

#### **Primary System Study Limits**

As discussed with City of Greenville stormwater staff, study limits for the hydraulic evaluation of the primary systems include the following:

- Fork Swamp from East Baywood Lane at the upstream end to approximately 900 feet upstream of the Worthington Road crossing;
- Fork Swamp UT1 (FSUT1) from approximately 250 feet upstream of the Trafalgar Drive – South crossing at the upstream end to its confluence with Fork Swamp at the downstream end;;
- Fork Swamp UT2R1 (FSUT2R1) from Old Tar Toad crossing at the upstream end to its confluence with Fork Swamp at the downstream end;
- Fork Swamp UT2R2 (FSUT2R2) from approximately 300 feet downstream of the Regency Boulevard crossing at the upstream end to West Fire Tower Road crossing at the downstream end; and
- Fork Swamp UT3 (FSUT3) from Queen Annes Road crossing and Charles Boulevard at the upstream end to its confluence with Fork Swamp at the downstream end.

#### **Stormwater Inventory**

For the Fork Swamp Watershed Master Plan, stormwater utility infrastructure throughout the watershed was collected by WK Dickson personnel to compile a Geographic Information System (GIS) stormwater inventory database for the City. This was accomplished by using Global Positioning Systems (GPS) as the primary means of data capture. WK Dickson employed survey grade GPS to locate the x, y, and z coordinates of each visible stormwater system structure and conventional surveying techniques to obtain other attributes including but not limited to size, material, slope, and length. Additionally, attributes were also collected for select streams and open channel. Data was obtained for those streams and open channels required to complete connectivity for modeling purposes. The data was collected using horizontal datum NAD 1983 and vertical datum NAVD 1988

Attributes collected as part of the inventory were used to populate the various models. Field visits and digital photographs for each structure and channel were used to estimate the roughness coefficients and energy loss coefficients. The topographic data used for the Fork Swamp Watershed Master Plan was the State of North Carolina's LiDAR data.

#### **Cross Sections**

Cross sections utilized in the HEC-RAS model were based on the existing FEMA cross sections (where available). These surveyed cross sections were augmented with additional cross sections surveyed by WK Dickson. The surveyed cross section points were then merged with the digital elevation model based on the LiDAR data. Cross sections were located perpendicular to the flow and at intervals along the stream to characterize the flow capacity of the channel and floodplain for the primary system. Along stream reaches where

## APPENDIX B

### HYDRAULIC ANALYSIS

---

the shape, size, and geometry of the cross-section are varying, cross sections were cut at closer intervals than for reaches having little change in channel characteristic. Additional sections were cut as required by the HEC-RAS program to sufficiently model structures such as culverts.

Surveyed cross sections are identified by station number, which for the HEC-RAS model, refers to the approximate linear distance upstream from a reference point on the main channel or tributary reach. The cross sections depict the locations of cut sections from field topographic surveys. Similarly, the cross section at each road crossing represents the top-of-road cross section. The cross sections just upstream and just downstream of highest point of roadway (commonly referred to as the weir) represent the locations of the upstream and downstream faces, respectively, of the bridge or culvert in an area not impacted by roadway fill.

#### **Roughness Coefficients**

Manning's roughness coefficients, or 'n' values, represent the resistance to flow and influence the flow capacity of channels and floodplains. The HEC-RAS model uses these coefficients to compute friction loss longitudinally in the channel and floodplain. The roughness value is a function of the type and density of the vegetation, channel bottom and stream bank material, degree of channel meandering, and depth of flow.

Roughness coefficients were determined for all stream reaches for which hydraulic analyses were performed. The "horizontal variation in n-values" option was enabled to allow for correct modeling of the widely varied surfaces on a given cross-section. The right or left bank of the stream is referenced facing downstream. Roughness coefficients used in this study are listed in Table B-2.

**Table B-2: Roughness Coefficients**

| Location       | Range of 'n' values |
|----------------|---------------------|
| Main Channel   | 0.04 - 0.054        |
| Left Overbank  | 0.05 - 0.2          |
| Right Overbank | 0.05 - 0.2          |

All roughness coefficients were estimated through field observation and by referencing standard engineering manuals.

#### **Culvert and Roadway Data**

Culverts generally have different characteristics than the channel and floodplains away from roadway crossings. Often culverts constrict flood flows in the channel and floodplain, which may create backwater effects upstream of the structure. The constriction can produce increased velocities and result in localized scour.

## APPENDIX B

### HYDRAULIC ANALYSIS

---

For culvert analysis, the HEC-RAS model utilizes the concepts of "inlet" control and "outlet" control to simplify complicated culvert hydraulics. Inlet control flow occurs when the flow carrying capacity of the culvert entrance is less than the flow capacity of the culvert barrel. Outlet control flow occurs when the culvert carrying capacity is limited by downstream conditions or by the flow capacity of the culvert barrel.

During inlet control computations, the culvert inlet acts as either a weir or an orifice, and the resulting headwater is computed. The equations used by HEC-RAS are the same as those developed by the Federal Highway Administration during extensive laboratory testing, which describe the inlet control headwater under various conditions.

For outlet control flow conditions, the required headwater is computed considering various conditions. For culverts flowing full, a form of the Bernoulli Equation, which considers friction losses, entrance losses and exit losses is utilized. Friction losses are based on Manning's equation. Entrance losses are computed as a coefficient times the velocity head in the culvert at the upstream end. Exit losses are computed as a coefficient times the change in velocity head from just inside the culvert (at the downstream end) to outside the culvert.

When the culvert is not flowing full, the direct step backwater procedure is used to calculate the profile through the culvert up to the culvert inlet. An entrance loss is then computed and added to the energy inside the culvert to obtain the upstream headwater. Culvert input data for the HEC-RAS model include:

- Shape and dimensions of the structure openings;
- Culvert length;
- Entrance loss coefficient, exit loss coefficient and coefficient of discharge for weir flow during roadway overtopping;
- Upstream and downstream invert elevations;
- Federal Highway Administration chart number for the culvert type;
- Top-of-road elevations to describe the weir during roadway overtopping and the weir crest length; and
- Four cross sections are required; one cross section sufficiently downstream of the culvert that flow is not affected by the culvert, one at the downstream end of the culvert, one at the upstream end of the culvert, and one located far enough upstream that the culvert has no effect on flow.

#### **Energy Loss Coefficients**

Contraction and expansion of flow produces energy losses caused by the transition. The magnitude of these losses is related to the velocity and the estimated loss coefficient. Where the transitions are gradual, the losses are small. At abrupt changes in cross-sectional area, the losses are higher. Energy losses resulting from expansion are greater than losses associated

## APPENDIX B

### HYDRAULIC ANALYSIS

---

with contraction. Energy loss coefficients used for the Fork Swamp Watershed hydraulic models are presented in Table B-3.

**Table B-3: Energy Loss Coefficients**

| Type of Transition | Expansion | Contraction |
|--------------------|-----------|-------------|
| None               | 0         | 0           |
| Gradual            | 0.3       | 0.1         |
| Culvert sections   | 0.5       | 0.3         |

#### **Starting Water Surface Elevation**

The starting water surface elevations for Fork Swamp, FSUT2R2, and FSUT3 HEC-RAS models were calculated using the slope-area method, which is based on normal depth. The calculated slopes are as follows:

- 0.0037 feet/feet for Fork Swamp Main Branch
- 0.0043 feet/feet for Fork Swamp UT2-R2
- 0.0035 feet/feet for Fork Swamp UT3

For the Fork Swamp UT1 and Fork Swamp UT2-R1 HEC-RAS models, the starting water surfaces elevations were set based on values calculated in the Fork Swamp Main Branch HEC-RAS model.

#### **Model Run Descriptions and Assumptions**

The HEC-RAS model was used to compute flood elevations at each cross-section for the Fork Swamp, FSUT1, FSUT2R1, FSUT2R2, and FSUT3 Primary Systems for the 2-, 10-, 25-, 50- and 100-year floods. A hard copy of the HEC-RAS input and output is included in Appendix H, while a digital copy of the input and output is located on the CD in Appendix J.

The hydraulic analysis for this study is based only on the condition of unobstructed flow. Therefore, flood elevations shown on the profiles are considered valid only if hydraulic structures remain unobstructed and do not fail. Flood elevations may be raised by debris blockage of the culvert, channel, or floodplain.

#### **Model Validation**

Efforts were made to verify the models for various storm events. Feedback obtained from the questionnaires was reviewed for relevant information that could be used to verify the model. The comments and responses received were not specific enough to verify the model. Likewise, the information received during the public meetings was not useful for the purposes of verifying the models. The City Staff was able to provide some feedback that was useful during the model validation process.

## APPENDIX B HYDRAULIC ANALYSIS

During the validation process, the flows and water surface elevations initially calculated were determined to be significantly higher than the FEMA flow and base flood elevations. Furthermore, the results from the initial existing conditions model were not aligned with some of the feedback received from the City. The flows were calibrated to get results to more closely match FEMA flows, USGS Regional Regression flows, and City feedback.

### Open Channel Systems and Roadway Flooding

Fifteen (15) roadway crossings were analyzed for flooding potential in the Fork Swamp Watershed Master Plan. All roadway crossings that were analyzed in this study are listed in Tables B-4a – B-4c along with the minimum top-of-road elevations and the 2-, 10-, 25-, 50- and 100-year flood elevations at the crossing for existing and proposed conditions.

**Table B-4a: Overtopping Analysis of Roadway Crossings – Existing Conditions**

| Location                             | Minimum Elevation at Top of Road (feet NAVD) | Desired Level of Service (Year) | Calculated Water Surface Elevations (feet NAVD) |               |               |               |                |
|--------------------------------------|--|---------------------------------|---|---------------|---------------|---------------|----------------|
|                                      |  |                                 | 2-year flood                                    | 10-year flood | 25-year flood | 50-year flood | 100-year flood |
| <b>FORK SWAMP</b>                    |  |                                 |   |               |               |               |                |
| East Baywood Lane (Culvert)          | 66.01  | 25-year                         | 63.88   | 66.27         | 68.77         | 70.98         | 71.36          |
| Railroad (Culvert)                   | 70.89  | 100-year                        | 63.05   | 65.99         | 68.74         | 70.97         | 71.35          |
| Evans Street (Culvert)               | 66.51  | 50-year                         | 61.42   | 63.97         | 65.78         | 66.88         | 67.20          |
| East Fire Tower Road (Bridge)        | 58.23  | 50-year                         | 55.57   | 57.19         | 57.62         | 58.39         | 58.75          |
| <b>FORK SWAMP UT1</b>                |  |                                 |   |               |               |               |                |
| Trafalgar Drive – South (Culvert)    | 55.81  | 25-year                         | 53.70   | 55.95         | 56.29         | 56.47         | 56.62          |
| Trafalgar Drive – North (Culvert)    | 54.35  | 25-year                         | 53.05   | 54.67         | 55.14         | 55.43         | 55.75          |
| Corey Road (Culvert)                 | 54.81  | 25-year                         | 52.32   | 53.40         | 54.26         | 55.04         | 55.40          |
| <b>FORK SWAMP UT2R1</b>              |  |                                 |   |               |               |               |                |
| Old Tar Road (Culvert)               | 55.64  | 25-year                         | 55.46   | 56.30         | 56.56         | 56.71         | 56.86          |
| <b>FORK SWAMP UT2R2</b>              |  |                                 |   |               |               |               |                |
| West Fire Tower Road (Culvert)       | 65.70  | 50-year                         | 60.61   | 61.90         | 62.67         | 63.30         | 63.96          |
| <b>FORK SWAMP UT3</b>                |  |                                 |   |               |               |               |                |
| Coleman Drive (Culvert)              | 61.97  | 25-year                         | 59.18   | 61.26         | 61.96         | 62.44         | 62.81          |
| County Home Road (Culvert)           | 65.81  | 50-year                         | 63.09   | 65.51         | 66.13         | 66.45         | 66.72          |
| East Fire Tower Road – U/S (Culvert) | 64.51  | 50-year                         | 61.96   | 64.72         | 64.96         | 65.16         | 65.32          |
| Wimbledon Drive (Culvert)            | 63.61  | 50-year                         | 61.69   | 64.09         | 64.25         | 64.35         | 64.44          |
| Tower Place (Culvert)                | 63.01  | 25-year                         | 60.62   | 63.02         | 63.29         | 63.45         | 63.58          |

## APPENDIX B HYDRAULIC ANALYSIS

|                                      |       |         |       |              |              |              |              |
|--------------------------------------|-------|---------|-------|--------------|--------------|--------------|--------------|
| Summerhaven Drive (Culvert)          | 61.51 | 25-year | 59.81 | <b>62.13</b> | <b>62.49</b> | <b>62.75</b> | <b>62.93</b> |
| East Fire Tower Road – U/S (Culvert) | 59.51 | 25-year | 57.48 | <b>59.74</b> | <b>60.20</b> | <b>60.49</b> | <b>60.72</b> |

\*Bold text indicates the existing water surface has exceeded the crest or low point in the road thereby causing flooding.

\*\* Green shade indicates crossing meets desired level of service. Red shade indicates crossing does not meet desired level of service.

**Table B-4b: Overtopping Analysis of Roadway Crossings – Alternative #1 (Option #1)**

| Location   | Minimum Elevation at Top of Road (feet NAVD) | Desired Level of Service (Year) | Calculated Water Surface Elevations (feet NAVD) |               |               |               |                |
|--|--|---------------------------------|---|---------------|---------------|---------------|----------------|
|  |  |                                 | 2-year flood                                    | 10-year flood | 25-year flood | 50-year flood | 100-year flood |
| <b>FORK SWAMP</b>  |  |                                 |   |               |               |               |                |
| East Baywood Lane (Existing Twin 72" CMPs)   | 66.01  | 25-year                         | 63.87   | 65.98         | <b>66.55</b>  | <b>68.10</b>  | <b>70.91</b>   |
| Railroad (Existing Twin 84" CMPs with Proposed Floodplain Benching)                      | 70.89  | 100-year                        | 63.03   | 65.01         | 66.41         | 68.02         | 70.87          |
| Evans Street (Proposed Twin 7' x 7' RCBCs with Floodplain Benching)                      | 66.51  | 50-year                         | 60.30   | 61.89         | 62.86         | 63.78         | 64.99          |
| East Fire Tower Road (Existing Bridge with Proposed Extended Floodplain Benching)        | 58.23  | 50-year                         | 54.99   | 56.39         | 57.50         | 58.22         | <b>58.57</b>   |
| <b>FORK SWAMP UT1</b>  |  |                                 |   |               |               |               |                |
| Trafalgar Drive - South (Existing Twin 60" CMPs with Proposed 60" Floodplain Culvert)    | 55.81  | 25-year                         | 53.14   | 54.57         | 55.62         | <b>56.13</b>  | <b>56.38</b>   |
| Trafalgar Drive - North (Proposed Twin 8' x 5' RCBCs)                                    | 54.35  | 25-year                         | 52.40   | 53.48         | 54.19         | <b>54.73</b>  | <b>55.14</b>   |
| Corey Road (Existing Twin 13' x 4.5 CMP Arch with Proposed Twin 48" Floodplain Culverts) | 54.81  | 25-year                         | 50.95   | 51.65         | 52.29         | 52.99         | 53.91          |
| <b>FORK SWAMP UT2R1</b>  |  |                                 |   |               |               |               |                |
| Old Tar Road (Culvert)   | 55.64  | 25-year                         | 53.39   | 54.43         | 55.02         | 55.54         | <b>56.17</b>   |
| <b>FORK SWAMP UT2R2 – NO ALTERNATIVE PROPOSED</b>  |  |                                 |   |               |               |               |                |
| <b>FORK SWAMP UT3</b>  |  |                                 |   |               |               |               |                |
| Coleman Drive (Existing Triple 10' x 4' RCBCs)   | 61.97  | 25-year                         | 57.70   | 59.44         | 60.45         | 61.32         | <b>61.98</b>   |



## APPENDIX B HYDRAULIC ANALYSIS

|  |       |         |       |       |       |              |              |
|--|-------|---------|-------|-------|-------|--------------|--------------|
| County Home Road<br>(Twin 48" RCPs with<br>Proposed 42" Floodplain<br>Culvert) | 65.81 | 50-year | 63.12 | 63.95 | 64.77 | 65.60        | <b>66.17</b> |
| East Fire Tower Road –<br>U/S (Proposed 12' x 6'<br>RCBC)                      | 64.51 | 50-year | 61.16 | 62.36 | 63.50 | 64.30        | <b>64.70</b> |
| Wimbledon Drive<br>(Proposed Twin 10' x 5')                                    | 63.61 | 25-year | 60.47 | 61.82 | 63.08 | <b>63.74</b> | <b>64.03</b> |
| Tower Place<br>(Proposed Twin 10' x 5')  | 63.01 | 25-year | 59.51 | 61.18 | 62.47 | <b>63.03</b> | <b>63.30</b> |
| Summerhaven Drive<br>(Proposed Twin 12' x<br>5.5')                             | 61.51 | 25-year | 58.49 | 60.26 | 61.38 | <b>62.06</b> | <b>62.45</b> |
| East Fire Tower Road –<br>D/S (Proposed 12' x 7'<br>RCBC)                      | 59.51 | 50-year | 55.84 | 57.29 | 58.33 | 59.27        | <b>60.00</b> |

\*Bold text indicates the existing water surface has exceeded the crest or low point in the road thereby causing flooding.

\*\* Green shade indicates crossing meets desired level of service. Red shade indicates crossing does not meet desired level of service.

**Table B-4c: Overtopping Analysis of Roadway Crossings – Alternative #1 (Option #2)**

| Location  | Minimum<br>Elevation at<br>Top of Road<br>(feet NAVD) | Desired<br>Level of<br>Service<br>(Year) | Calculated Water Surface Elevations (feet NAVD) |                  |                  |                  |                   |
|---|---|--|---|------------------|------------------|------------------|-------------------|
|   |   |  | 2-year<br>flood                                 | 10-year<br>flood | 25-year<br>flood | 50-year<br>flood | 100-year<br>flood |
| <b>FORK SWAMP</b>   |   |  |   |                  |                  |                  |                   |
| East Baywood Lane<br>(Existing Twin 72"<br>CMPs)  | 66.01   | 25-year                                  | 63.86   | 66.00            | <b>67.17</b>     | <b>70.12</b>     | <b>71.28</b>      |
| Railroad (Existing Twin<br>84" CMPs with Proposed<br>Floodplain Benching)                 | 70.89   | 100-year                                 | 63.01   | 65.03            | 67.09            | 70.08            | <b>71.28</b>      |
| Evans Street (Existing<br>Twin 84" CMPs with<br>Proposed Floodplain<br>Benching)          | 66.51   | 50-year                                  | 60.52   | 62.63            | 64.32            | 66.05            | <b>66.95</b>      |
| East Fire Tower Road<br>(Existing Bridge with<br>Proposed Reduced<br>Floodplain Benching) | 58.23   | 50-year                                  | 55.00   | 56.39            | 57.50            | 58.22            | <b>58.57</b>      |
| <b>FORK SWAMP UT1 – NO OPTION #2 PROPOSED</b>   |   |  |   |                  |                  |                  |                   |
| <b>FORK SWAMP UT2R1 – NO OPTION #2 PROPOSED</b>   |   |  |   |                  |                  |                  |                   |
| <b>FORK SWAMP UT2R2– NO OPTION #2 PROPOSED</b>  |   |  |   |                  |                  |                  |                   |
| <b>FORK SWAMP UT3– NO OPTION #2 PROPOSED</b>  |   |  |   |                  |                  |                  |                   |

\*Bold text indicates the existing water surface has exceeded the crest or low point in the road thereby causing flooding.

\*\* Green shade indicates crossing meets desired level of service. Red shade indicates crossing does not meet desired level of service.

### **Hydraflow Storm Sewers**

The purpose of the hydrologic analysis for the secondary systems, or closed systems, was to estimate the peak runoff that would flow to the catch basins and into the closed system. The rational method was used for the closed system hydrologic analysis. The rational method can be expressed as follows:

$$Q = CiA$$

- Q = maximum rate of runoff (cfs)
- C = runoff coefficient representing a ration of runoff to rainfall
- i = average rainfall intensity for a duration equal to the time of concentration (in/hr)
- A = drainage area contributing to the design location (acres)

### **SWMM**

SWMM is a dynamic rainfall-runoff model capable of modeling the hydrologic response of a watershed and hydraulic routing throughout a stormwater conveyance system. The model calculates the effect of backwater, flat or negative slopes, energy losses, and minor headlosses associated with bends, entrances and exits.

Input data for the EPA SWMM (hydraulics) computer model include the following:

- Conveyance pipes including structure inverts, pipe sizes and lengths;
- Open channel cross section geometries;
- Roughness coefficients for pipes and channels;
- Energy loss coefficients for flow in the pipes and channels;
- Storage rating curves; and
- Overland flow characteristics.

SWMM provides an accurate evaluation of the existing and proposed conditions because it combines hydrology and hydraulics while accounting for the routing effects of the channel and overbank storage areas. Because hydrology and hydraulics are combined, changes to peak flows or water surface elevations resulting from proposed modifications to the existing channels or culverts are calculated in the model in one step. Additionally, changes to flows from proposed pipes and channel improvements are seen both upstream and downstream, reducing the potential for a stormwater system having increased flooding downstream.

### **Energy Loss Coefficients**

Contraction and expansion of flow produces energy losses caused by the transition. The magnitude of these losses is related to the velocity and the estimated loss coefficient. Where the transitions are gradual, the losses are small. At abrupt changes in cross-sectional area, the

## APPENDIX B

### HYDRAULIC ANALYSIS

---

losses are higher. Energy losses resulting from expansion are greater than losses associated with contraction. Energy loss coefficients used for the hydraulic SWMM models are presented in Table B-5 below:

**Table B-5: Energy Loss Coefficients for SWMM Models**

| Type of Transition | Expansion | Contraction                    |
|--------------------|-----------|--------------------------------|
| None               | 0         | 0                              |
| Manhole/Inlet      | 0.7       | 0.5                            |
| Open Channel       | 1         | 0.5–Headwall/ 0.9 - Projecting |

Additional energy losses for structures having bends were divided between the two joining pipes. The bend losses used for this project are based on NCDOT values, and are shown below in Table B-6.

**Table B-6: Bend Loss Coefficients**

| Angle (°) | Loss Coefficient | Angle (°) | Loss Coefficient |
|-----------|------------------|-----------|------------------|
| 90        | 0.70             | 40        | 0.38             |
| 80        | 0.66             | 30        | 0.28             |
| 70        | 0.61             | 25        | 0.22             |
| 60        | 0.55             | 20        | 0.16             |
| 50        | 0.47             | 15        | 0.10             |

---

## **Appendix C:**

### **Watershed, Landuse, and Soils Maps**

#### List of Contents:

1. Fork Swamp Watershed Map
  2. Fork Swamp Existing Landuse Map
  3. Fork Swamp Future Landuse Map
  4. Fork Swamp Soils Map
-

**Legend**

- Streams
- Minor Streams
- Water Bodies
- Primary - Drainage Basins

**Streets**



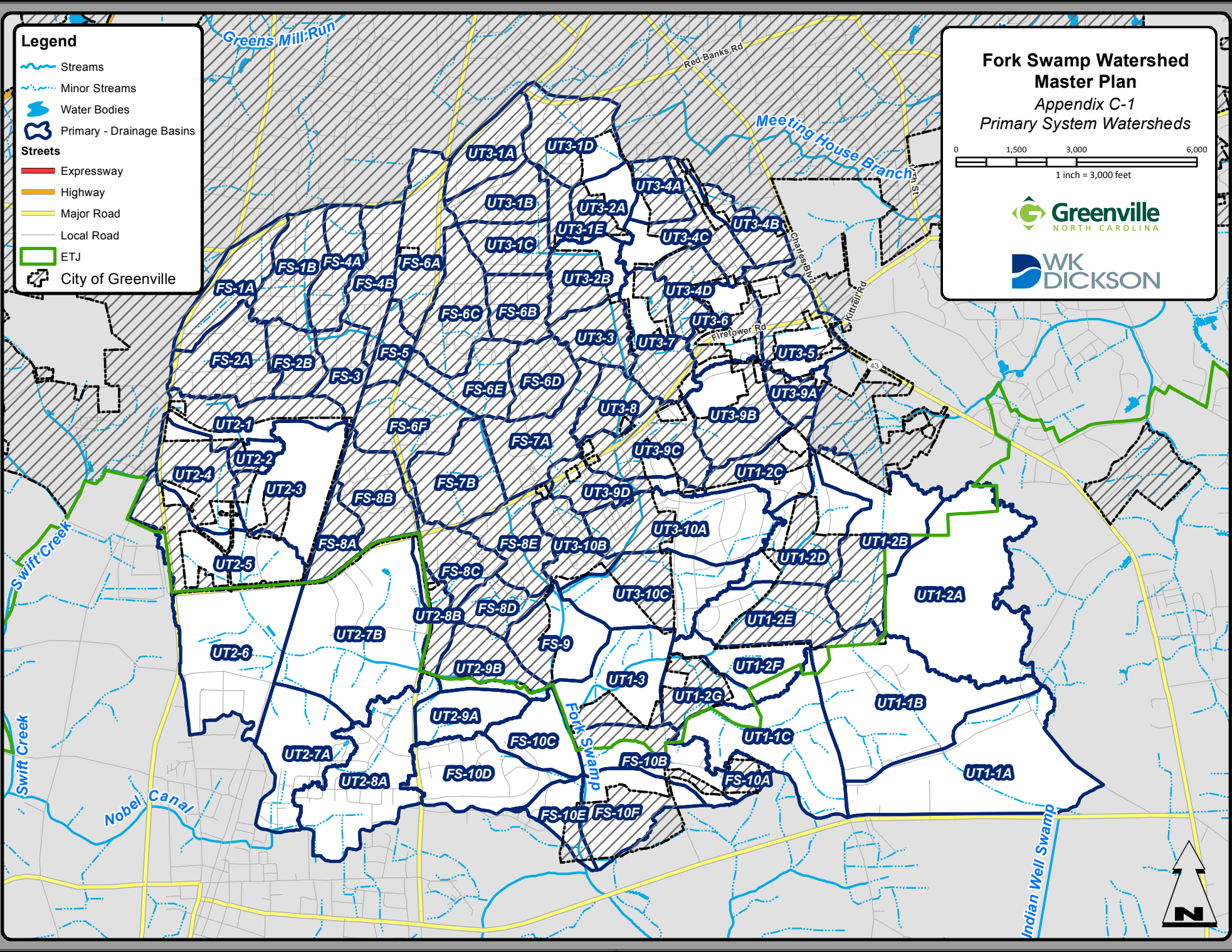
- Expressway
- Highway
- Major Road
- Local Road

ETJ






















City of Greenville

**Fork Swamp Watershed Master Plan**  
**Appendix C-1**  
**Primary System Watersheds**

0 1,500 3,000 6,000  
 1 inch = 3,000 feet

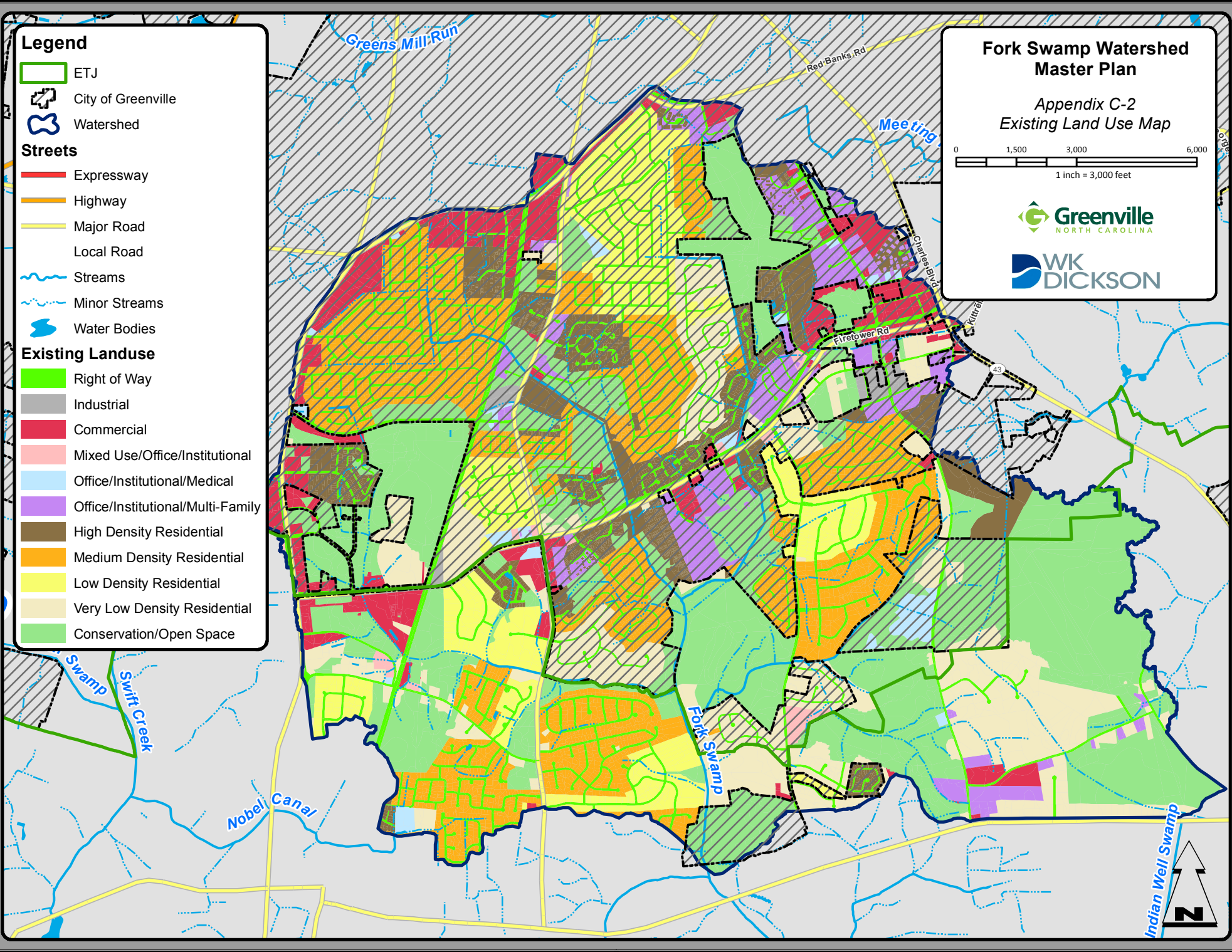
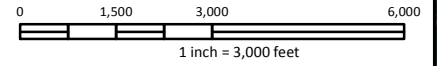




**Legend**




-  ETJ
-  City of Greenville
-  Watershed
- Streets**
-  Expressway
-  Highway
-  Major Road
-  Local Road
-  Streams
-  Minor Streams
-  Water Bodies
- Existing Landuse**
-  Right of Way
-  Industrial
-  Commercial
-  Mixed Use/Office/Institutional
-  Office/Institutional/Medical
-  Office/Institutional/Multi-Family
-  High Density Residential
-  Medium Density Residential
-  Low Density Residential
-  Very Low Density Residential
-  Conservation/Open Space

**Fork Swamp Watershed  
Master Plan**

*Appendix C-2  
Existing Land Use Map*

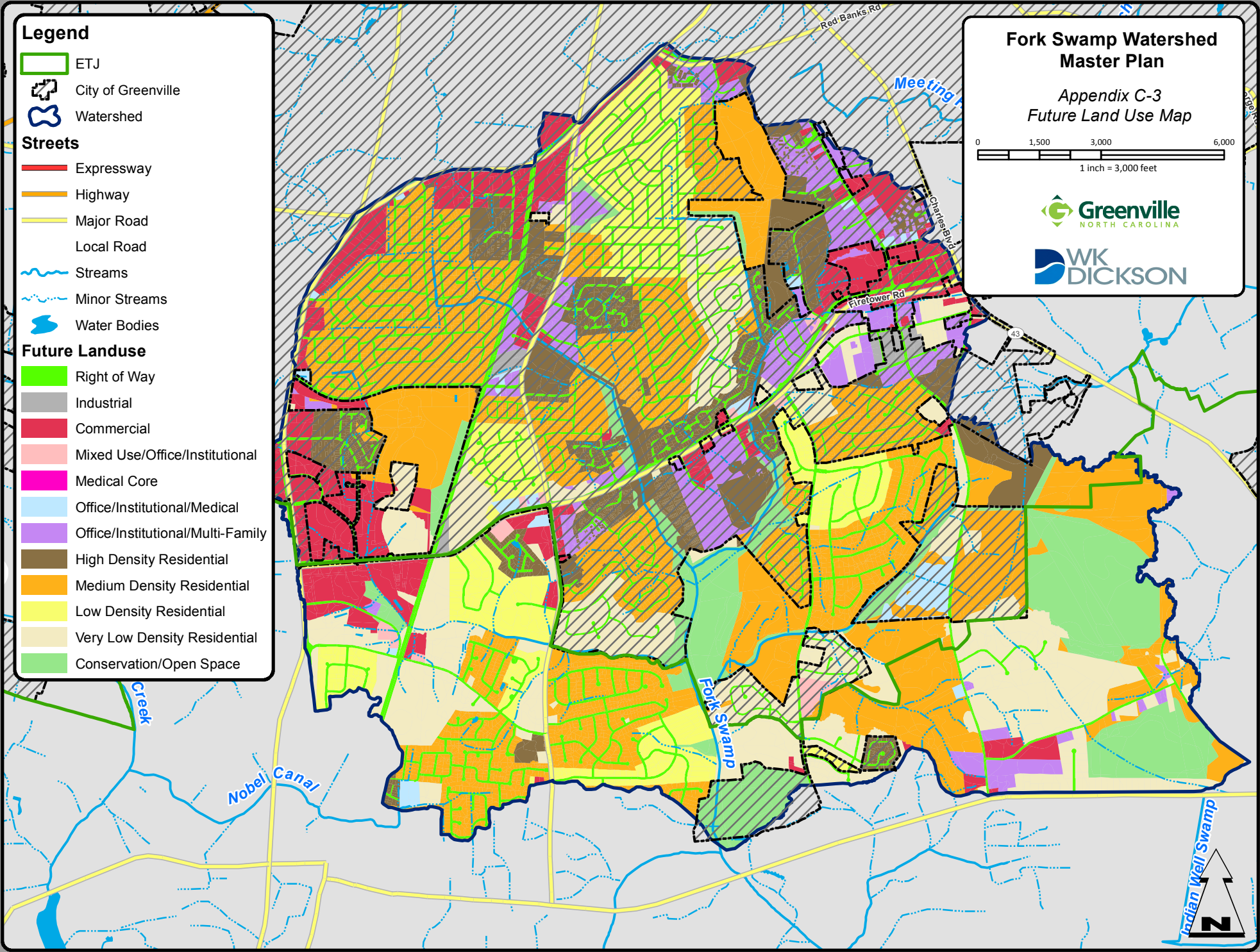
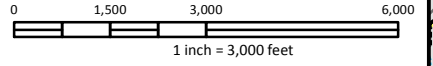


**Legend**

-  ETJ
-  City of Greenville
-  Watershed
- Streets**
-  Expressway
-  Highway
-  Major Road
-  Local Road
-  Streams
-  Minor Streams
-  Water Bodies
- Future Landuse**
-  Right of Way
-  Industrial
-  Commercial
-  Mixed Use/Office/Institutional
-  Medical Core
-  Office/Institutional/Medical
-  Office/Institutional/Multi-Family
-  High Density Residential
-  Medium Density Residential
-  Low Density Residential
-  Very Low Density Residential
-  Conservation/Open Space

**Fork Swamp Watershed  
Master Plan**

*Appendix C-3  
Future Land Use Map*

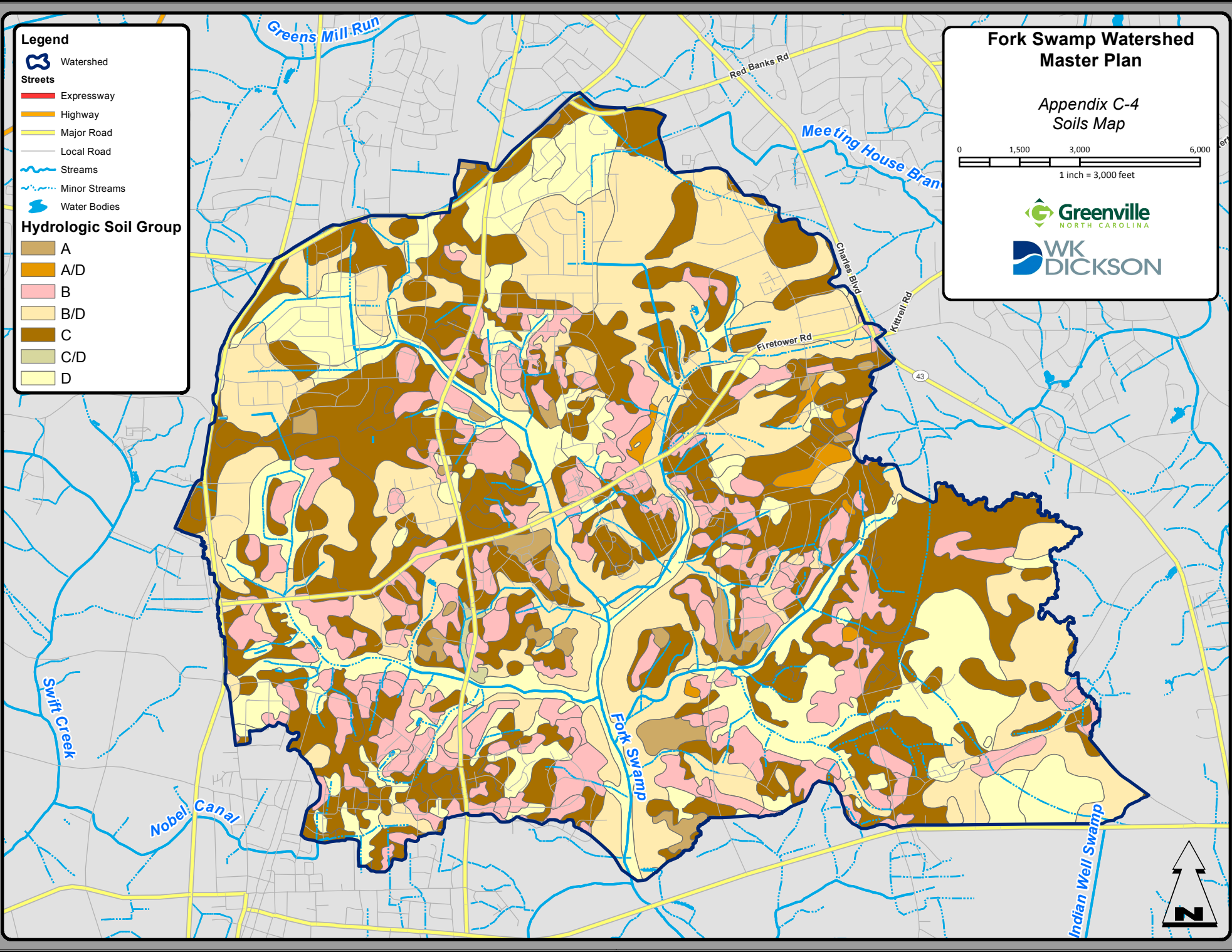
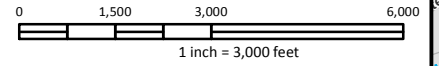


**Legend**

- Watershed
- Streets**
  - Expressway
  - Highway
  - Major Road
  - Local Road
- Streams
- Minor Streams
- Water Bodies
- Hydrologic Soil Group**
  - A
  - A/D
  - B
  - B/D
  - C
  - C/D
  - D

**Fork Swamp Watershed  
Master Plan**

*Appendix C-4  
Soils Map*





---

## **Appendix D:**

### **Citizen Input**

#### List of Contents:

1. General Survey Results (Table D-1)
  2. Frequency and Location of Flooding Question Responses (Table D-2)
  3. Impacted/Threatened by Erosion (Table D-3)
  4. City Funds Utilization (Table D-4)
  5. Greenville Watershed Master Plans Questionnaire
  6. Fork Swamp Public Meeting Minutes
-

**APPENDIX D**  
**CITIZEN INPUT - RESULTS OF SURVEYS**

**Table D-1: General Survey Results**

| Survey Question Number | Question  | Survey Response |    |       |
|------------------------|---|-----------------|----|-------|
|                        |   | Yes             | No | Maybe |
| 1                      | Have you ever experienced flooding on your system property during a (non-Hurricane) storm?  | 18              | 14 | -     |
| 4                      | Have you ever noticed flooded streets in your neighborhood?   | 24              | 8  | -     |
| 5                      | Has flooding increased on your property due to changes on nearby properties or drainage systems?  | 4               | 27 | -     |
| 6                      | Have you had any erosion on your property associated with a stream or drainage ditch?   | 6               | 26 | -     |
| 8                      | Are you aware that the City of Greenville is currently analyzing and looking for possible solutions to erosion, flooding and water quality issues throughout the City with a watershed master planning process? | 15              | 16 | -     |
| 9                      | If a cost-sharing program was made available along with training, would you be willing to install a project such as a rain garden, cistern, backyard wetland, etc. to help improve water quality in your area?  | 11              | 5  | 16    |
| 10                     | Are you aware of how the City of Greenville currently spends or utilizes its stormwater utility fee?  | 7               | 25 | -     |

**APPENDIX D**  
**CITIZEN INPUT - RESULTS OF SURVEYS**

**Table D-2: Frequency and Location of Flooding Question Responses (Question 2)**

| Frequency of Flooding      | Flooding Location |         |             |              |                                 |                                  |                                      |
|----------------------------|-------------------|---------|-------------|--------------|---------------------------------|----------------------------------|--------------------------------------|
|                            | Storage Building  | AC Unit | Crawl Space | Living Space | Yard flooding from stream/ditch | Yard flooding from street runoff | Yard flooding from adjacent property |
| Never                      | -                 | -       | -           | -            | -                               | -                                | -                                    |
| Less than once per year    | -                 | -       | -           | -            | -                               | 1                                | -                                    |
| Once per year              | -                 | -       | -           | -            | -                               | -                                | -                                    |
| 2-3 times per year         | 1                 | 1       | 2           | -            | 3                               | 3                                | 1                                    |
| More than 3 times per year | 1                 | -       | 1           | 1            | 2                               | 4                                | 3                                    |
| Every time it rains        | -                 | -       | -           | -            | -                               | -                                | -                                    |

**Table D-3: Impacted/Threatened by Erosion (Question 7)**

| Item   | Number of Responses |
|--------|---------------------|
| Street | -                   |
| Yard   | 5                   |
| Garage | -                   |
| Fence  | -                   |
| Other  | -                   |

**Table D-4: How should City utilize funds to address stormwater runoff, erosion and flooding issues? (Question 11)**

| Item   | Number of Responses |
|--|---------------------|
| Develop cost-share program for installation of water projects to reduce stormwater flows | 18                  |
| Develop incentives for replanting riparian areas   | 18                  |
| Develop program to address erosion on private property                                   | 14                  |
| Construct and maintain water quality control practices on private property               | 23                  |
| Stream restoration   | 23                  |
| Buyout of flood-prone properties   | 13                  |
| Other  | 10                  |

## GREENVILLE WATERSHED MASTER PLANS QUESTIONNAIRE

The City of Greenville’s Stormwater Management Program is conducting a citywide study to identify flooding, erosion, and water quality concerns. Your answers will help us target our efforts. Please take this brief survey to let us know what you are experiencing. Thank you for your participation!

1. Have you ever experienced flooding on your property during a (non-Hurricane) storm?  Yes  No  
If yes, please provide the address where this flooding is occurring.

---

2. If yes, which of the following would apply and what is the frequency?

- Water in storage building \_\_\_\_\_
- Water on air condition units \_\_\_\_\_
- Water in crawl space \_\_\_\_\_
- Water up to, or in the living space \_\_\_\_\_
- Yard flooding from stream/ditch \_\_\_\_\_
- Yard flooding from street runoff \_\_\_\_\_
- Yard flooding from adjacent property \_\_\_\_\_

| FREQUENCY |                          |
|-----------|--------------------------|
| A         | Less than once a year    |
| B         | Once a year              |
| C         | 2-3 times a year         |
| D         | More than 3 times a year |

3. List dates, locations, and depth of water (ex: On May 10, 2014, at my mailbox it was 2 feet deep)

---



---



---

4. Have you ever noticed flooded streets in your neighborhood?  Yes  No  
If yes, tell us when, the locations, and depth of water.

---



---

5. Has flooding increased on your property due to any changes on nearby properties or drainage systems? If yes, what were those changes and the approximate timeframe?

Yes  No

---

6. Have you had any erosion on your property associated with a stream or drainage ditch?  Yes  No

7. If yes, which of the following are impacted or threatened by erosion  Street  Yard
- Building/House  Fence
  - Other \_\_\_\_\_

8. Are you aware that the City of Greenville is currently analyzing and looking for possible solutions to flooding, erosion, and water quality issues throughout the City with a watershed master planning process?  
 Yes  No

9. If a cost-sharing program was made available along with training, would you be willing to install a project such as a rain garden, cistern, backyard wetland, etc. to help improve water quality in your area?  
 Yes  No  Maybe

10. Are you aware of how the City of Greenville currently spends or utilizes its stormwater utility fee?  
 Yes  No

11. In what ways should the City of Greenville utilize funds to address excessive stormwater runoff, erosion and flooding issues throughout the City? (Check all that apply)

Examples include the following:

- Develop cost-sharing program for installation of projects to reduce stormwater flows
- Develop incentives for replanting areas adjacent to streams
- Construct and maintain regional detention facilities on public properties
- Construct and maintain water quality facilities on public properties
- Stream restoration
- Buyout of flood prone properties
- Other \_\_\_\_\_

12. Is there anything else you would like for us to know about water quality issues in your area?

---

---

**May we contact you if we need additional information about flooding and erosion in your area?**

Name: \_\_\_\_\_

Property Address: \_\_\_\_\_

Primary Residence or Business (if different from Property Address): \_\_\_\_\_

Phone # (if needed for a response by the City): \_\_\_\_\_

How long have you been at this location? \_\_\_\_\_

**To Send This Comment Form**  
**Direct Mail:**  
Greenville Watershed Master Plans  
c/o The Wooten Company  
301 West 14<sup>th</sup> Street  
Greenville, NC 27834  
**FAX: 252-757-3221**  
**E-Mail: [wsmp@greenvillenc.gov](mailto:wsmp@greenvillenc.gov)**



**City of Greenville, Dept. of Public Works      Fork Swamp Creek Watershed**  
**Division of Stormwater Management      November 4, 2014**  
**Watershed Master Plan Public Meeting      Location: Faith Assembly Church**

**City of Greenville and Consultant Attendees**

|   |                              |
|---|------------------------------|
| Amanda Boone, City of Greenville                  | Tom Murray, W.K. Dickson     |
| Victor Long, City of Greenville                   | Stefani Barlow, W.K. Dickson |
| Scott Godefroy, City Engineer, City of Greenville | David Kiker, W.K. Dickson    |
| Marla Hill, PEQ                                   | Inga Kennedy, PEQ            |

**Meeting Summary**

1. Welcome and Purpose of Meeting

- Residents of Greenville’s Fork Swamp Creek watershed were invited to learn more about the Watershed Master Plan process and to give their input on stormwater issues and challenges they have experienced.
- The meeting began with an open house where attendees could view watershed maps to mark the location of their property, identify areas of flooding and other stormwater issues, and speak with staff and consultants of the City’s Stormwater Division about their problems and observations.
- Attendees were then invited to hear a short presentation on the Watershed Master Plan. Project engineer Amanda Boone explained the overall purpose of the master planning process and then invited consultant Tom Murray of W.K. Dickson to describe the findings to date from the field assessment of the watershed. Inga Kennedy of PEQ shared information about the City’s public involvement commitment and activities. Amanda Boone ended the presentation with a description of next steps and then the open house resumed.

2. Questions/Comments by Participants

- Statistics say that 100 thousand acres in North Carolina are developed every year, resulting in a tremendous quantity of impervious surface. Does the City have ordinances to control the amount of impervious surface, e.g., limiting street width? Reducing parking area and building decks would be a good way to lower the amount of impervious surface.
  - We are not aware of any limits to impervious surface, but developments are required to provide detention for a ten-year storm and can be required to design for up to a 25-year storm. There are also standard roadway widths, but the City has not tried to minimize

widths for stormwater control purposes. Older roads tend to be wider. ECU is building a parking deck, as is the Georgetown apartment complex.

- In the Club Pines and Westhaven areas, lots of trees – especially pine – shed their foliage and drains get stopped up. How can we get the drains unstopped without having to do it ourselves?
  - The City’s street sweeping operation should help with that but pine trees will continue to be a problem, especially in Arlington. It requires vigilance, and residents are encouraged to call the Streets Division for assistance.
- The bridge on Worthington was replaced two years ago; was it done to address drainage or maintenance?
  - The bridge was old and in disrepair; that work was done for maintenance.
- Because that area is low there are continued issues with flooding. Can that area be built up?
  - No, it cannot.

### 3. Participant Feedback at Stations

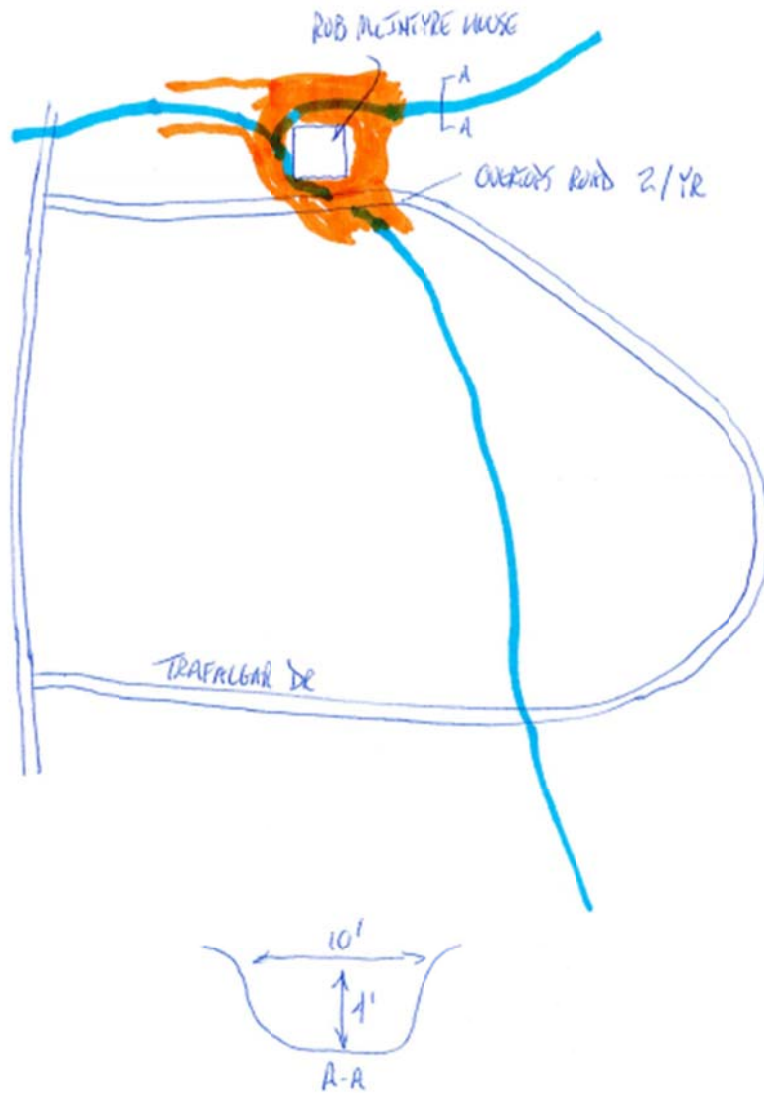
- 3256 Landmark St – John Southworth
  - Wanted to report that area was recently moved into FEMA floodplain, but have not experienced flooding to any structures
  - Landmark St floods 4 – 5 times per year, approximately 6 – 12 inches on the road
  - Flooding reaches the mailbox, but does not reach concrete pad that building is located on
  - Flood waters last approximately 1 hour
  - Suspect that flooding occurs from grass clogging yard inlet across from the field (commercially zoned) after mowing
- 4100 Cornwall Ct – Linwood Harton Jr
  - Experiences backyard flooding from drainage channel behind his property
  - Flooding occurs approximately 5 – 6 times per year
  - Takes a couple days to drain, owner is concerned about mosquito breeding during the summer
  - Suspects that drainage channels behind his house are clogging during storms and hindering pipe flow
- 1311 Trafalgar Rd – Roscoe Tippet
  - The single 72” RCP at Corey Road was replaced with twin 72” RCP about 5 years ago (NCDOT did this). Since then they have not had flooding problems. Ditches fill up and need maintenance in this area.

- 1303 Trafalgar Rd – Rodney and Brenda Roos
  - Experience nuisance yard flooding when it rains 5 or more inches. Their yard does not flood when it rains 2 or 3 inches.
  
- 1209 Trafalgar Rd – Rob McIntyre
  - Has lived here 8 years (see Attachment #1 for additional details on the flooding).
  - Twice a year Trafalgar overtops and the flooding surrounds his house.
  - Backyard gets 2 feet deep and stays up for about 6 hours.
  - When it rains real hard (1”) the open channel fills up to the top of bank which is about 4 feet deep (and 10 feet wide). This is not a problem.
  - The AC unit is up 4 feet off the ground. Water has been to within 2 feet of the AC unit.
  - Rob McIntyre has seen Worthington overtop about twice/year, it gets at least 6 inches over the road and the County comes out and puts up signs. Someone was killed here when they ignored the signs. The low area is not at the bridge. This area is outside the City.
  - Near 317 Vernon White Rd – Mr. McIntyre has seen this road overtop several times to a depth of at least 6 inches. This area is outside the City.
  
- 4110 Treetops Circle - Brenda Diggs
  - She has lived her 8 years.
  - She sees ¾ of her backyard flood about 4 times a year. Her backyard is in the 100-year floodway and floodplain.
  - Her primary concern is erosion as she cannot go any landscaping because it will wash away. Dave Kiker told Brenda that someone would go onsite to look closer at the erosion problem. The erosion is in her yard and not along the channel (she doesn't walk to the channel).
  - Her other concern is flooding. Water has reached to within 10 feet of her wooden deck and 20 feet from her home. Her neighbor's fence has been lost twice. Flood levels will get within 3 feet of the top of her neighbors fence. It is a 6 foot high fence. Water has never reached deck. Dave Kiker told Brenda that resolving nuisance yard flooding along FEMA streams can prove very challenging. Sometimes there are solutions that dramatically improve flooding but this is not the typical case.
  - Brenda can be reached at home at 252-321-7047. Her cell is 252-814-7389.
  - Cedar Ridge development went in 8+ years ago. They are now flooding.
  
- 103 Placid Way – Sondra Byrd



- Backyard is flooded significantly. Homeowner believes yard flooding occurs due to construction of raised parking lot adjacent to property at Carquest along Greenville Blvd.
- Flooding occurs approximately six times a year and is generally 4 to 6 inches deep across majority of backyard.
- Additional concerns include tree removal by David Hill along Greenville Blvd.
  
- 111 Martinsborough Rd– Marsha Wyly (Lynndale Subdivision)
  - System was designed in early 1960's and roads and yards flood throughout neighborhood
  - Rivers & Associates has been working on design of improvements in subdivision. The homeowner did not seem satisfied with the proposed improvements near her property.
  - Flooding occurs during 1 to 2 inch rain events that occur over the span of 1 to 2 hours. All storm drains in neighborhood flood. Owner thinks additional inlets may help, but acknowledges that pipes are likely flowing at capacity as well.
  - Ditch alongside house has a flat or negative slope and holds water. Water depth in the ditch can be as high as 5 to 8 feet.
  
- 116 Fort Sumter Dr – Richard Hurns (Lynndale Subdivision)
  - Intersection of Martinsborough and Fort Sumter flood.
  - Water is 6" high at Crown Point Road and Fort Sumter
  - Flooding occurs 2 to 3 times a year between 200 and 400 Martinsborough. Streets unpassable at times.

Attachment #1:



---

## **Appendix E:**

### **SCS Hydrology Calculations**

#### List of Contents:

1. Existing Curve Number Calculations
  2. Future Curve Number Calculations
-

### SCS Runoff Curve Number - Primary System

Project: City of Greenville - Fork Swamp Watershed  
 Conditions: Existing  
 Prepared by: SMB  
 Checked by: TLM  
 Date: February 4, 2015

#### Subbasin: FS - 1A

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 1.1             | 0.002             | 95                         |
| Right-Of-Way                 | B/D   | 89  | 3.2             | 0.005             | 288                        |
| Right-Of-Way                 | C     | 92  | 8.4             | 0.013             | 772                        |
| Right-Of-Way                 | D     | 93  | 2.3             | 0.004             | 214                        |
| Commercial                   | B     | 92  | 0.5             | 0.001             | 44                         |
| Commercial                   | B/D   | 92  | 14.1            | 0.022             | 1297                       |
| Commercial                   | C     | 94  | 17.1            | 0.027             | 1607                       |
| Commercial                   | D     | 95  | 8.9             | 0.014             | 850                        |
| Office/Institutional/Medical | C     | 90  | 1.3             | 0.002             | 115                        |
| Office/Institutional/Medical | D     | 92  | 0.7             | 0.001             | 60                         |
| Medium Density Residential   | B/D   | 70  | 8.5             | 0.013             | 596                        |
| Medium Density Residential   | C     | 80  | 3.6             | 0.006             | 287                        |
| Medium Density Residential   | D     | 85  | 6.5             | 0.010             | 555                        |
| <b>Totals =</b>              |       |     | 76.2            | 0.119             | 6780.4                     |

Total (weighted) RCN = total product/total area = 89.00

RCN used = 89

#### Subbasin: FS - 1B

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B/D   | 89  | 2.5             | 0.004             | 219                        |
| Right-Of-Way               | C     | 92  | 3.6             | 0.006             | 331                        |
| Right-Of-Way               | D     | 93  | 8.0             | 0.013             | 747                        |
| Commercial                 | B     | 92  | 0.6             | 0.001             | 59                         |
| Commercial                 | B/D   | 92  | 1.6             | 0.002             | 143                        |
| Commercial                 | C     | 94  | 8.8             | 0.014             | 827                        |
| High Density Residential   | C     | 83  | 0.5             | 0.001             | 40                         |
| Medium Density Residential | B/D   | 70  | 10.0            | 0.016             | 699                        |
| Medium Density Residential | C     | 80  | 12.5            | 0.019             | 997                        |
| Medium Density Residential | D     | 85  | 34.0            | 0.053             | 2889                       |
| <b>Totals =</b>            |       |     | 82.0            | 0.128             | 6950.4                     |

Total (weighted) RCN = total product/total area = 84.76

RCN used = 85

#### Subbasin: FS - 2A

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B/D   | 89  | 12.3            | 0.019             | 1091                       |
| Right-Of-Way               | C     | 92  | 5.1             | 0.008             | 467                        |
| Right-Of-Way               | D     | 93  | 4.2             | 0.007             | 392                        |
| Commercial                 | B/D   | 92  | 6.1             | 0.010             | 559                        |
| Commercial                 | C     | 94  | 0.2             | 0.000             | 21                         |
| Commercial                 | D     | 95  | 0.6             | 0.001             | 60                         |
| Medium Density Residential | B/D   | 70  | 39.9            | 0.062             | 2795                       |
| Medium Density Residential | C     | 80  | 18.9            | 0.030             | 1513                       |
| Medium Density Residential | D     | 85  | 12.2            | 0.019             | 1033                       |
| <b>Totals =</b>            |       |     | 99.5            | 0.155             | 7930.9                     |

Total (weighted) RCN = total product/total area = 79.73

RCN used = 80

**Subbasin: FS - 2B**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | C     | 92  | 4.5             | 0.007             | 416                        |
| Right-Of-Way               | D     | 93  | 5.6             | 0.009             | 525                        |
| Medium Density Residential | C     | 80  | 15.7            | 0.025             | 1255                       |
| Medium Density Residential | D     | 85  | 22.8            | 0.036             | 1937                       |
| Totals =                   |       |     | 48.7            | 0.076             | 4133.7                     |

Total (weighted) RCN = total product/total area = 84.97

RCN used = 85

**Subbasin: FS - 3**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B     | 89  | 2.5             | 0.004             | 222                        |
| Right-Of-Way               | C     | 92  | 6.3             | 0.010             | 581                        |
| Right-Of-Way               | D     | 93  | 1.0             | 0.002             | 97                         |
| High Density Residential   | C     | 83  | 0.8             | 0.001             | 70                         |
| Medium Density Residential | B     | 70  | 8.1             | 0.013             | 570                        |
| Medium Density Residential | B/D   | 70  | 0.1             | 0.000             | 10                         |
| Medium Density Residential | C     | 80  | 23.5            | 0.037             | 1883                       |
| Medium Density Residential | D     | 85  | 11.0            | 0.017             | 939                        |
| Totals =                   |       |     | 53.56           | 0.084             | 4371.4                     |

Total (weighted) RCN = total product/total area = 81.62

RCN used = 82

**Subbasin: FS - 4A**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B     | 89  | 0.1             | 0.000             | 6                          |
| Right-Of-Way               | B/D   | 89  | 5.7             | 0.009             | 503                        |
| Right-Of-Way               | C     | 92  | 0.7             | 0.001             | 65                         |
| Right-Of-Way               | D     | 93  | 1.6             | 0.003             | 150                        |
| Commercial                 | B     | 92  | 0.2             | 0.000             | 19                         |
| Commercial                 | B/D   | 92  | 8.4             | 0.013             | 775                        |
| Commercial                 | C     | 94  | 8.5             | 0.013             | 801                        |
| Commercial                 | D     | 95  | 0.1             | 0.000             | 8                          |
| High Density Residential   | B/D   | 75  | 3.2             | 0.005             | 243                        |
| High Density Residential   | C     | 83  | 7.5             | 0.012             | 623                        |
| High Density Residential   | D     | 87  | 1.9             | 0.003             | 167                        |
| Medium Density Residential | B/D   | 70  | 17.6            | 0.028             | 1235                       |
| Medium Density Residential | C     | 80  | 1.9             | 0.003             | 152                        |
| Medium Density Residential | D     | 85  | 5.6             | 0.009             | 475                        |
| Totals =                   |       |     | 63.1            | 0.099             | 5222.4                     |

Total (weighted) RCN = total product/total area = 82.80

RCN used = 83

**Subbasin: FS - 4B**

| Landuse                    | Soil  |     | Area    | Area      | Product of   |
|----------------------------|-------|-----|---------|-----------|--------------|
|                            | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way               | B     | 89  | 0.6     | 0.001     | 52           |
| Right-Of-Way               | B/D   | 89  | 2.2     | 0.003     | 198          |
| Right-Of-Way               | C     | 92  | 8.1     | 0.013     | 744          |
| Right-Of-Way               | D     | 93  | 3.5     | 0.005     | 321          |
| Commercial                 | B     | 92  | 0.4     | 0.001     | 40           |
| Commercial                 | B/D   | 92  | 1.1     | 0.002     | 106          |
| Commercial                 | C     | 94  | 10.1    | 0.016     | 949          |
| Commercial                 | D     | 95  | 9.8     | 0.015     | 926          |
| High Density Residential   | B/D   | 75  | 7.9     | 0.012     | 595          |
| High Density Residential   | C     | 83  | 9.5     | 0.015     | 791          |
| High Density Residential   | D     | 87  | 2.8     | 0.004     | 247          |
| Medium Density Residential | B     | 70  | 2.0     | 0.003     | 143          |
| Medium Density Residential | B/D   | 70  | 1.9     | 0.003     | 135          |
| Medium Density Residential | C     | 80  | 10.7    | 0.017     | 858          |
| Medium Density Residential | D     | 85  | 4.5     | 0.007     | 381          |
| <b>Totals =</b>            |       |     | 75.3    | 0.118     | 6486.5       |

Total (weighted) RCN = total product/total area = 86.18

RCN used = 86

**Subbasin: FS - 5**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 1.3     | 0.002     | 115          |
| Right-Of-Way                      | C     | 92  | 3.1     | 0.005     | 285          |
| Right-Of-Way                      | D     | 93  | 0.8     | 0.001     | 74           |
| Office/Institutional/Multi-Family | B     | 85  | 0.0     | 0.000     | 4            |
| Office/Institutional/Multi-Family | C     | 90  | 3.3     | 0.005     | 295          |
| Office/Institutional/Multi-Family | D     | 92  | 1.2     | 0.002     | 114          |
| High Density Residential          | C     | 83  | 3.6     | 0.006     | 298          |
| Open Space, Good Condition        | B     | 61  | 7.7     | 0.012     | 472          |
| Open Space, Good Condition        | C     | 74  | 7.8     | 0.012     | 580          |
| Open Space, Good Condition        | D     | 80  | 4.1     | 0.006     | 324          |
| <b>Totals =</b>                   |       |     | 32.96   | 0.052     | 2560.8       |

Total (weighted) RCN = total product/total area = 77.69

RCN used = 78

**Subbasin: FS - 6A**

| Landuse                          | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                  | Group |     |                 |                   |                            |
| Right-Of-Way                     | B     | 89  | 1.1             | 0.002             | 96                         |
| Right-Of-Way                     | B/D   | 89  | 2.3             | 0.004             | 204                        |
| Right-Of-Way                     | C     | 92  | 9.1             | 0.014             | 839                        |
| Right-Of-Way                     | D     | 93  | 2.5             | 0.004             | 233                        |
| Commercial                       | A     | 89  | 1.8             | 0.003             | 163                        |
| Commercial                       | B     | 92  | 1.4             | 0.002             | 129                        |
| Commercial                       | B/D   | 92  | 3.4             | 0.005             | 313                        |
| Commercial                       | C     | 94  | 19.5            | 0.030             | 1831                       |
| Commercial                       | D     | 95  | 10.7            | 0.017             | 1016                       |
| Office/Institutionl/Multi-Family | B     | 85  | 1.2             | 0.002             | 104                        |
| Office/Institutionl/Multi-Family | B/D   | 85  | 1.0             | 0.002             | 82                         |
| Office/Institutionl/Multi-Family | C     | 90  | 0.5             | 0.001             | 48                         |
| Office/Institutionl/Multi-Family | D     | 92  | 1.0             | 0.002             | 90                         |
| High Density Residential         | B     | 75  | 2.6             | 0.004             | 192                        |
| High Density Residential         | B/D   | 75  | 1.7             | 0.003             | 127                        |
| High Density Residential         | C     | 83  | 13.9            | 0.022             | 1157                       |
| Medium Density Residential       | B     | 70  | 0.1             | 0.000             | 9                          |
| Medium Density Residential       | B/D   | 70  | 2.3             | 0.004             | 162                        |
| Medium Density Residential       | C     | 80  | 3.7             | 0.006             | 298                        |
| Medium Density Residential       | D     | 85  | 1.0             | 0.002             | 83                         |
| Low Density Residential          | D     | 84  | 3.1             | 0.005             | 261                        |
| Very Low Density Residential     | B     | 69  | 0.6             | 0.001             | 39                         |
| Very Low Density Residential     | B/D   | 69  | 3.6             | 0.006             | 252                        |
| Very Low Density Residential     | C     | 79  | 1.9             | 0.003             | 151                        |
| Open Space, Good Condition       | B/D   | 61  | 5.7             | 0.009             | 351                        |
| Open Space, Good Condition       | C     | 74  | 6.3             | 0.010             | 468                        |
| Open Space, Good Condition       | D     | 80  | 1.8             | 0.003             | 142                        |
| <b>Totals =</b>                  |       |     | 103.93          | 0.162             | 8840.0                     |

**Total (weighted) RCN = total product/total area = 85.06**

**RCN used = 85**

**Subbasin: FS - 6B**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B     | 89  | 2.9             | 0.005             | 262                        |
| Right-Of-Way               | B/D   | 89  | 6.1             | 0.009             | 541                        |
| Right-Of-Way               | C     | 92  | 3.0             | 0.005             | 274                        |
| Right-Of-Way               | D     | 93  | 0.8             | 0.001             | 77                         |
| High Density Residential   | B     | 75  | 1.6             | 0.002             | 117                        |
| High Density Residential   | B/D   | 75  | 1.7             | 0.003             | 129                        |
| High Density Residential   | C     | 83  | 0.1             | 0.000             | 4                          |
| High Density Residential   | D     | 87  | 0.5             | 0.001             | 43                         |
| Medium Density Residential | B     | 70  | 2.7             | 0.004             | 190                        |
| Medium Density Residential | B/D   | 70  | 5.0             | 0.008             | 351                        |
| Medium Density Residential | C     | 80  | 8.2             | 0.013             | 655                        |
| Medium Density Residential | D     | 85  | 0.0             | 0.000             | 1                          |
| Low Density Residential    | B     | 68  | 4.4             | 0.007             | 296                        |
| Low Density Residential    | B/D   | 68  | 13.7            | 0.021             | 930                        |
| Low Density Residential    | C     | 79  | 5.5             | 0.009             | 433                        |
| Low Density Residential    | D     | 84  | 1.9             | 0.003             | 163                        |
| <b>Totals =</b>            |       |     | 58.0            | 0.091             | 4466.3                     |

**Total (weighted) RCN = total product/total area = 76.96**

**RCN used = 77**

**Subbasin: FS - 6C**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B     | 89  | 5.3             | 0.008             | 473                        |
| Right-Of-Way                      | B/D   | 89  | 1.1             | 0.002             | 102                        |
| Right-Of-Way                      | C     | 92  | 2.8             | 0.004             | 257                        |
| Right-Of-Way                      | D     | 93  | 4.2             | 0.007             | 391                        |
| Office/Institutional/Medical      | D     | 92  | 0.0             | 0.000             | 0                          |
| Office/Institutional/Multi-Family | B     | 85  | 2.3             | 0.004             | 195                        |
| Office/Institutional/Multi-Family | C     | 90  | 2.4             | 0.004             | 214                        |
| Office/Institutional/Multi-Family | D     | 92  | 1.7             | 0.003             | 157                        |
| High Density Residential          | A     | 61  | 0.1             | 0.000             | 7                          |
| High Density Residential          | B     | 75  | 11.0            | 0.017             | 826                        |
| High Density Residential          | B/D   | 75  | 0.1             | 0.000             | 5                          |
| High Density Residential          | C     | 83  | 4.6             | 0.007             | 383                        |
| High Density Residential          | D     | 87  | 11.6            | 0.018             | 1007                       |
| Medium Density Residential        | B     | 70  | 3.1             | 0.005             | 220                        |
| Medium Density Residential        | B/D   | 70  | 0.2             | 0.000             | 13                         |
| Medium Density Residential        | C     | 80  | 9.8             | 0.015             | 781                        |
| Medium Density Residential        | D     | 85  | 5.9             | 0.009             | 500                        |
| Low Density Residential           | B     | 68  | 1.2             | 0.002             | 79                         |
| Low Density Residential           | B/D   | 68  | 3.8             | 0.006             | 257                        |
| Low Density Residential           | C     | 79  | 2.6             | 0.004             | 203                        |
| Low Density Residential           | D     | 84  | 1.6             | 0.002             | 131                        |
| Open Space, Good Condition        | A     | 39  | 1.3             | 0.002             | 51                         |
| Open Space, Good Condition        | B     | 61  | 4.8             | 0.008             | 296                        |
| Open Space, Good Condition        | B/D   | 61  | 0.3             | 0.000             | 17                         |
| Open Space, Good Condition        | C     | 74  | 9.7             | 0.015             | 717                        |
| Open Space, Good Condition        | D     | 80  | 4.9             | 0.008             | 393                        |
| <b>Totals =</b>                   |       |     | 96.31           | 0.150             | 7675.9                     |

Total (weighted) RCN = total product/total area = 79.70

RCN used = 80

**Subbasin: FS - 6D**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 0.1             | 0.000             | 6                          |
| Right-Of-Way                 | B     | 89  | 1.4             | 0.002             | 122                        |
| Right-Of-Way                 | B/D   | 89  | 2.4             | 0.004             | 213                        |
| Right-Of-Way                 | C     | 92  | 5.7             | 0.009             | 529                        |
| Right-Of-Way                 | D     | 93  | 2.8             | 0.004             | 256                        |
| High Density Residential     | A     | 61  | 0.5             | 0.001             | 29                         |
| High Density Residential     | B     | 75  | 0.0             | 0.000             | 0                          |
| High Density Residential     | C     | 83  | 0.0             | 0.000             | 2                          |
| High Density Residential     | D     | 87  | 0.5             | 0.001             | 42                         |
| Medium Density Residential   | A     | 54  | 0.2             | 0.000             | 11                         |
| Medium Density Residential   | B     | 70  | 5.7             | 0.009             | 402                        |
| Medium Density Residential   | B/D   | 70  | 9.7             | 0.015             | 680                        |
| Medium Density Residential   | C     | 80  | 21.2            | 0.033             | 1692                       |
| Medium Density Residential   | D     | 85  | 9.4             | 0.015             | 798                        |
| Very Low Density Residential | B     | 69  | 0.6             | 0.001             | 39                         |
| Very Low Density Residential | C     | 79  | 2.8             | 0.004             | 218                        |
| Very Low Density Residential | D     | 84  | 0.4             | 0.001             | 31                         |
| <b>Totals =</b>              |       |     | 63.22           | 0.099             | 5070.2                     |

Total (weighted) RCN = total product/total area = 80.20

RCN used = 80



**Subbasin: FS - 6E**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A     | 83  | 1.4     | 0.002     | 113          |
| Right-Of-Way                      | B     | 89  | 3.2     | 0.005     | 285          |
| Right-Of-Way                      | B/D   | 89  | 0.2     | 0.000     | 16           |
| Right-Of-Way                      | C     | 92  | 2.5     | 0.004     | 229          |
| Right-Of-Way                      | D     | 93  | 0.8     | 0.001     | 79           |
| Commercial                        | C     | 94  | 0.5     | 0.001     | 45           |
| Commercial                        | D     | 95  | 1.4     | 0.002     | 137          |
| Office/Institutional/Multi-Family | A     | 77  | 0.7     | 0.001     | 53           |
| Office/Institutional/Multi-Family | B     | 85  | 2.6     | 0.004     | 219          |
| Office/Institutional/Multi-Family | C     | 90  | 0.3     | 0.001     | 31           |
| Office/Institutional/Multi-Family | D     | 92  | 0.2     | 0.000     | 17           |
| High Density Residential          | A     | 61  | 0.0     | 0.000     | 1            |
| High Density Residential          | B     | 75  | 4.1     | 0.006     | 308          |
| High Density Residential          | B/D   | 75  | 2.2     | 0.004     | 168          |
| High Density Residential          | C     | 83  | 4.0     | 0.006     | 333          |
| High Density Residential          | D     | 87  | 3.6     | 0.006     | 315          |
| Medium Density Residential        | A     | 54  | 1.6     | 0.002     | 86           |
| Medium Density Residential        | B     | 70  | 1.9     | 0.003     | 131          |
| Medium Density Residential        | B/D   | 70  | 0.0     | 0.000     | 0            |
| Medium Density Residential        | C     | 80  | 6.5     | 0.010     | 516          |
| Medium Density Residential        | D     | 85  | 2.3     | 0.004     | 194          |
| Open Space, Good Condition        | A     | 39  | 2.3     | 0.004     | 91           |
| Open Space, Good Condition        | B     | 61  | 7.7     | 0.012     | 470          |
| Open Space, Good Condition        | B/D   | 61  | 5.1     | 0.008     | 309          |
| Open Space, Good Condition        | C     | 74  | 4.5     | 0.007     | 333          |
| Open Space, Good Condition        | D     | 80  | 8.3     | 0.013     | 665          |
| <b>Totals =</b>                   |       |     | 67.9    | 0.106     | 5143.7       |

**Total (weighted) RCN = total product/total area = 75.75**

**RCN used = 76**

### Subbasin: FS - 6F

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A     | 83  | 0.3             | 0.000             | 22                         |
| Right-Of-Way                      | B     | 89  | 5.4             | 0.008             | 479                        |
| Right-Of-Way                      | B/D   | 89  | 0.3             | 0.000             | 25                         |
| Right-Of-Way                      | C     | 92  | 8.1             | 0.013             | 747                        |
| Right-Of-Way                      | D     | 93  | 2.6             | 0.004             | 243                        |
| Industrial                        | B     | 88  | 4.7             | 0.007             | 410                        |
| Industrial                        | C     | 91  | 2.6             | 0.004             | 240                        |
| Industrial                        | D     | 93  | 1.0             | 0.002             | 96                         |
| Commercial                        | D     | 95  | 0.0             | 0.000             | 3                          |
| Office/Institutional/Medical      | C     | 90  | 1.7             | 0.003             | 151                        |
| Office/Institutional/Medical      | D     | 92  | 0.4             | 0.001             | 39                         |
| Office/Institutional/Multi-Family | C     | 90  | 2.9             | 0.005             | 262                        |
| Office/Institutional/Multi-Family | D     | 92  | 0.3             | 0.000             | 26                         |
| High Density Residential          | A     | 61  | 3.5             | 0.006             | 215                        |
| High Density Residential          | B     | 75  | 9.3             | 0.015             | 698                        |
| High Density Residential          | C     | 83  | 1.4             | 0.002             | 118                        |
| High Density Residential          | D     | 87  | 6.9             | 0.011             | 598                        |
| Medium Density Residential        | A     | 54  | 0.7             | 0.001             | 37                         |
| Medium Density Residential        | B     | 70  | 12.2            | 0.019             | 851                        |
| Medium Density Residential        | B/D   | 70  | 0.0             | 0.000             | 0                          |
| Medium Density Residential        | C     | 80  | 12.6            | 0.020             | 1008                       |
| Medium Density Residential        | D     | 85  | 5.3             | 0.008             | 453                        |
| Very Low Density Residential      | A     | 49  | 0.5             | 0.001             | 25                         |
| Very Low Density Residential      | B     | 69  | 0.2             | 0.000             | 13                         |
| Very Low Density Residential      | B/D   | 69  | 0.1             | 0.000             | 8                          |
| Very Low Density Residential      | C     | 79  | 0.1             | 0.000             | 6                          |
| Very Low Density Residential      | D     | 84  | 1.2             | 0.002             | 103                        |
| Open Space, Good Condition        | B     | 61  | 6.3             | 0.010             | 385                        |
| Open Space, Good Condition        | B/D   | 61  | 0.3             | 0.000             | 15                         |
| Open Space, Good Condition        | C     | 74  | 9.9             | 0.016             | 735                        |
| Open Space, Good Condition        | D     | 80  | 5.0             | 0.008             | 397                        |
| <b>Totals =</b>                   |       |     | 105.8           | 0.165             | 8410.0                     |

Total (weighted) RCN = total product/total area = 79.48

RCN used = 79

**Subbasin: FS - 7A**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 7.9             | 0.012             | 707                        |
| Right-Of-Way                 | B/D   | 89  | 0.6             | 0.001             | 51                         |
| Right-Of-Way                 | C     | 92  | 2.8             | 0.004             | 261                        |
| Right-Of-Way                 | D     | 93  | 5.5             | 0.009             | 511                        |
| Commercial                   | D     | 95  | 0.0             | 0.000             | 4                          |
| High Density Residential     | B     | 75  | 12.2            | 0.019             | 917                        |
| High Density Residential     | B/D   | 75  | 3.2             | 0.005             | 238                        |
| High Density Residential     | C     | 80  | 4.8             | 0.008             | 385                        |
| High Density Residential     | D     | 87  | 13.1            | 0.020             | 1139                       |
| Medium Density Residential   | B     | 70  | 0.8             | 0.001             | 59                         |
| Medium Density Residential   | C     | 80  | 4.5             | 0.007             | 357                        |
| Medium Density Residential   | D     | 85  | 20.5            | 0.032             | 1742                       |
| Very Low Density Residential | B     | 69  | 13.0            | 0.020             | 894                        |
| Very Low Density Residential | B/D   | 69  | 0.0             | 0.000             | 1                          |
| Very Low Density Residential | C     | 79  | 3.9             | 0.006             | 308                        |
| Very Low Density Residential | D     | 84  | 1.8             | 0.003             | 154                        |
| <b>Totals =</b>              |       |     | 94.7            | 0.148             | 7729.4                     |

**Total (weighted) RCN = total product/total area = 81.61**

**RCN used = 82**

**Subbasin: FS - 7B**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 0.4             | 0.001             | 36                         |
| Right-Of-Way                 | B     | 89  | 2.5             | 0.004             | 219                        |
| Right-Of-Way                 | B/D   | 89  | 2.1             | 0.003             | 185                        |
| Right-Of-Way                 | C     | 92  | 7.8             | 0.012             | 719                        |
| Right-Of-Way                 | D     | 93  | 0.8             | 0.001             | 72                         |
| Commercial                   | A     | 89  | 1.0             | 0.002             | 93                         |
| Commercial                   | C     | 94  | 0.1             | 0.000             | 6                          |
| High Density Residential     | A     | 61  | 0.2             | 0.000             | 15                         |
| High Density Residential     | B     | 75  | 2.2             | 0.003             | 166                        |
| High Density Residential     | B/D   | 75  | 0.7             | 0.001             | 56                         |
| High Density Residential     | C     | 83  | 11.5            | 0.018             | 958                        |
| High Density Residential     | D     | 87  | 1.6             | 0.003             | 139                        |
| Medium Density Residential   | B     | 70  | 1.2             | 0.002             | 87                         |
| Medium Density Residential   | C     | 70  | 5.1             | 0.008             | 356                        |
| Medium Density Residential   | D     | 85  | 0.5             | 0.001             | 40                         |
| Very Low Density Residential | C     | 79  | 3.2             | 0.005             | 255                        |
| Open Space, Good Condition   | A     | 39  | 1.4             | 0.002             | 55                         |
| Open Space, Good Condition   | B     | 61  | 15.1            | 0.024             | 923                        |
| Open Space, Good Condition   | B/D   | 61  | 5.5             | 0.009             | 338                        |
| Open Space, Good Condition   | C     | 74  | 22.3            | 0.035             | 1649                       |
| Open Space, Good Condition   | D     | 80  | 11.4            | 0.018             | 916                        |
| <b>Totals =</b>              |       |     | 96.85           | 0.151             | 7282.8                     |

**Total (weighted) RCN = total product/total area = 75.19**

**RCN used = 75**

**Subbasin: FS - 8A**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B/D   | 89  | 0.9             | 0.001             | 82                         |
| Right-Of-Way                 | C     | 92  | 4.0             | 0.006             | 366                        |
| Industrial                   | C     | 91  | 3.7             | 0.006             | 336                        |
| Office/Institutional/Medical | C     | 90  | 0.0             | 0.000             | 1                          |
| Very Low Density Residential | B/D   | 69  | 15.9            | 0.025             | 1100                       |
| Very Low Density Residential | C     | 79  | 13.9            | 0.022             | 1094                       |
| Very Low Density Residential | D     | 84  | 2.6             | 0.004             | 222                        |
| <b>Totals =</b>              |       |     | 41.03           | 0.064             | 3200.3                     |

**Total (weighted) RCN = total product/total area = 78.00**

**RCN used = 78**

**Subbasin: FS - 8B**

| Landuse                           | Soil  | RCN   | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-------|-----------------|-------------------|----------------------------|
|                                   | Group |       |                 |                   |                            |
| Right-Of-Way                      | B     | 89    | 2.2             | 0.003             | 196                        |
| Right-Of-Way                      | B/D   | 89    | 8.2             | 0.013             | 732                        |
| Right-Of-Way                      | C     | 92    | 3.1             | 0.005             | 281                        |
| Mixed Use/Office/Institutional    | B     | 85    | 0.6             | 0.001             | 51                         |
| Mixed Use/Office/Institutional    | B/D   | 85    | 0.2             | 0.000             | 19                         |
| Mixed Use/Office/Institutional    | C     | 90    | 1.4             | 0.002             | 128                        |
| Office/Institutional/Medical      | B     | 85    | 1.7             | 0.003             | 143                        |
| Office/Institutional/Medical      | B/D   | 85    | 0.1             | 0.000             | 9                          |
| Office/Institutional/Medical      | C     | 90    | 4.3             | 0.007             | 383                        |
| Office/Institutional/Multi-Family | B     | 85    | 0.1             | 0.000             | 8                          |
| Office/Institutional/Multi-Family | C     | 90    | 0.2             | 0.000             | 20                         |
| Medium Density Residential        | B     | 70    | 0.4             | 0.001             | 31                         |
| Medium Density Residential        | B/D   | 70    | 0.0             | 0.000             | 2                          |
| Medium Density Residential        | C     | 80    | 2.3             | 0.004             | 184                        |
| Medium Density Residential        | D     | 85    | 0.1             | 0.000             | 8                          |
| Low Density Residential           | A     | 51    | 0.5             | 0.001             | 27                         |
| Low Density Residential           | B     | 68    | 5.2             | 0.008             | 353                        |
| Low Density Residential           | B/D   | 68    | 37.0            | 0.058             | 2519                       |
| Low Density Residential           | C     | 79    | 9.5             | 0.015             | 751                        |
| Low Density Residential           | D     | 84    | 3.1             | 0.005             | 263                        |
| <b>Totals =</b>                   |       | 80.34 |                 | 0.126             | 6106.8                     |

Total (weighted) RCN = total product/total area = 76.01

RCN used = 76

**Subbasin: FS - 8C**

| Landuse                           | Soil  | RCN   | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-------|-----------------|-------------------|----------------------------|
|                                   | Group |       |                 |                   |                            |
| Right-Of-Way                      | A     | 83    | 0.8             | 0.001             | 70                         |
| Right-Of-Way                      | B     | 89    | 0.8             | 0.001             | 71                         |
| Right-Of-Way                      | C     | 92    | 6.0             | 0.009             | 547                        |
| Commercial                        | B     | 92    | 2.4             | 0.004             | 221                        |
| Commercial                        | C     | 94    | 3.4             | 0.005             | 321                        |
| Mixed Use/Office/Institutional    | A     | 77    | 0.0             | 0.000             | 4                          |
| Mixed Use/Office/Institutional    | B     | 85    | 0.0             | 0.000             | 3                          |
| Mixed Use/Office/Institutional    | C     | 90    | 0.5             | 0.001             | 43                         |
| Office/Institutional/Multi-Family | A     | 77    | 0.3             | 0.000             | 21                         |
| Office/Institutional/Multi-Family | B     | 85    | 6.9             | 0.011             | 583                        |
| Office/Institutional/Multi-Family | B/D   | 85    | 1.1             | 0.002             | 96                         |
| Office/Institutional/Multi-Family | C     | 90    | 3.7             | 0.006             | 332                        |
| High Density Residential          | A     | 61    | 3.8             | 0.006             | 234                        |
| High Density Residential          | B     | 75    | 1.3             | 0.002             | 99                         |
| High Density Residential          | B/D   | 75    | 0.2             | 0.000             | 15                         |
| High Density Residential          | C     | 83    | 5.4             | 0.008             | 449                        |
| Medium Density Residential        | A     | 54    | 0.3             | 0.000             | 16                         |
| Medium Density Residential        | B     | 70    | 2.9             | 0.005             | 202                        |
| Medium Density Residential        | B/D   | 70    | 0.7             | 0.001             | 51                         |
| Medium Density Residential        | C     | 80    | 3.6             | 0.006             | 284                        |
| Very Low Density Residential      | C     | 79    | 2.3             | 0.004             | 181                        |
| Open Space, Good Condition        | B     | 61    | 3.4             | 0.005             | 205                        |
| Open Space, Good Condition        | B/D   | 61    | 6.2             | 0.010             | 380                        |
| Open Space, Good Condition        | C     | 74    | 4.5             | 0.007             | 330                        |
| <b>Totals =</b>                   |       | 60.49 |                 | 0.095             | 4758.5                     |

Total (weighted) RCN = total product/total area = 78.66

RCN used = 79

**Subbasin: FS - 8D**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 0.7             | 0.001             | 57                         |
| Right-Of-Way                 | B     | 89  | 0.6             | 0.001             | 55                         |
| Right-Of-Way                 | B/D   | 89  | 3.0             | 0.005             | 270                        |
| Right-Of-Way                 | C     | 92  | 3.3             | 0.005             | 305                        |
| High Density Residential     | C     | 83  | 0.2             | 0.000             | 13                         |
| Medium Density Residential   | A     | 54  | 3.8             | 0.006             | 205                        |
| Medium Density Residential   | B     | 70  | 3.2             | 0.005             | 227                        |
| Medium Density Residential   | B/D   | 70  | 15.0            | 0.023             | 1051                       |
| Medium Density Residential   | C     | 80  | 6.4             | 0.010             | 512                        |
| Very Low Density Residential | A     | 49  | 0.4             | 0.001             | 17                         |
| Very Low Density Residential | B     | 69  | 1.5             | 0.002             | 104                        |
| Very Low Density Residential | B/D   | 69  | 0.4             | 0.001             | 26                         |
| Very Low Density Residential | C     | 79  | 4.2             | 0.007             | 333                        |
| Very Low Density Residential | D     | 84  | 0.1             | 0.000             | 5                          |
| Open Space, Good Condition   | B/D   | 61  | 1.7             | 0.003             | 106                        |
| <b>Totals =</b>              |       |     | 44.48           | 0.070             | 3283.9                     |

Total (weighted) RCN = total product/total area = 73.82

RCN used = 74

**Subbasin: FS - 8E**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A     | 83  | 1.7             | 0.003             | 139                        |
| Right-Of-Way                      | B     | 89  | 1.1             | 0.002             | 97                         |
| Right-Of-Way                      | B/D   | 89  | 1.4             | 0.002             | 120                        |
| Right-Of-Way                      | C     | 92  | 1.0             | 0.002             | 89                         |
| Right-Of-Way                      | D     | 93  | 0.0             | 0.000             | 2                          |
| Commercial                        | B     | 92  | 0.1             | 0.000             | 10                         |
| Commercial                        | C     | 94  | 0.3             | 0.000             | 24                         |
| Office/Institutional/Multi-Family | B     | 85  | 0.3             | 0.000             | 25                         |
| Office/Institutional/Multi-Family | C     | 90  | 0.2             | 0.000             | 15                         |
| Office/Institutional/Multi-Family | D     | 92  | 1.4             | 0.002             | 125                        |
| High Density Residential          | A     | 61  | 7.7             | 0.012             | 471                        |
| High Density Residential          | B     | 75  | 8.1             | 0.013             | 611                        |
| High Density Residential          | B/D   | 75  | 13.1            | 0.020             | 980                        |
| High Density Residential          | C     | 83  | 5.5             | 0.009             | 456                        |
| High Density Residential          | D     | 92  | 0.6             | 0.001             | 51                         |
| Medium Density Residential        | A     | 54  | 4.4             | 0.007             | 235                        |
| Medium Density Residential        | B     | 70  | 1.0             | 0.002             | 69                         |
| Medium Density Residential        | B/D   | 70  | 10.3            | 0.016             | 721                        |
| Medium Density Residential        | C     | 80  | 3.4             | 0.005             | 268                        |
| Very Low Density Residential      | B     | 69  | 1.3             | 0.002             | 87                         |
| Very Low Density Residential      | B/D   | 69  | 0.2             | 0.000             | 15                         |
| Very Low Density Residential      | D     | 84  | 0.2             | 0.000             | 20                         |
| Open Space, Good Condition        | A     | 39  | 2.4             | 0.004             | 95                         |
| Open Space, Good Condition        | B     | 61  | 0.3             | 0.000             | 16                         |
| Open Space, Good Condition        | B/D   | 61  | 11.3            | 0.018             | 688                        |
| Open Space, Good Condition        | C     | 74  | 1.5             | 0.002             | 109                        |
| <b>Totals =</b>                   |       |     | 78.44           | 0.123             | 5538.7                     |

Total (weighted) RCN = total product/total area = 70.61

RCN used = 71

**Subbasin: FS - 9**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | A     | 83  | 0.6     | 0.001     | 53           |
| Right-Of-Way                 | B     | 89  | 0.6     | 0.001     | 49           |
| Right-Of-Way                 | B/D   | 89  | 0.7     | 0.001     | 64           |
| Right-Of-Way                 | C     | 92  | 0.0     | 0.000     | 3            |
| High Density Residential     | B/D   | 75  | 0.0     | 0.000     | 2            |
| Medium Density Residential   | A     | 54  | 4.3     | 0.007     | 231          |
| Medium Density Residential   | B/D   | 70  | 8.9     | 0.014     | 620          |
| Medium Density Residential   | C     | 80  | 1.0     | 0.002     | 83           |
| Medium Density Residential   | D     | 85  | 0.1     | 0.000     | 12           |
| Very Low Density Residential | A     | 49  | 0.7     | 0.001     | 34           |
| Very Low Density Residential | B     | 69  | 1.9     | 0.003     | 129          |
| Very Low Density Residential | B/D   | 69  | 6.5     | 0.010     | 447          |
| Very Low Density Residential | C     | 79  | 1.2     | 0.002     | 97           |
| Open Space, Good Condition   | A     | 39  | 0.1     | 0.000     | 5            |
| Open Space, Good Condition   | B     | 61  | 4.8     | 0.008     | 296          |
| Open Space, Good Condition   | B/D   | 61  | 32.2    | 0.050     | 1967         |
| Open Space, Good Condition   | C     | 74  | 5.2     | 0.008     | 387          |
| Open Space, Good Condition   | D     | 80  | 20.2    | 0.032     | 1617         |
| <b>Totals =</b>              |       |     | 89.20   | 0.139     | 6094.1       |

Total (weighted) RCN = total product/total area = 68.32

RCN used = 68

**Subbasin: FS - 10A**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B     | 89  | 0.5     | 0.001     | 45           |
| Right-Of-Way                 | B/D   | 89  | 0.4     | 0.001     | 37           |
| Right-Of-Way                 | C     | 92  | 1.6     | 0.003     | 148          |
| Right-Of-Way                 | D     | 93  | 0.5     | 0.001     | 51           |
| Commercial                   | B     | 92  | 0.8     | 0.001     | 69           |
| High Density Residential     | B     | 75  | 2.4     | 0.004     | 179          |
| High Density Residential     | B/D   | 75  | 2.1     | 0.003     | 159          |
| High Density Residential     | C     | 83  | 5.8     | 0.009     | 477          |
| High Density Residential     | D     | 87  | 1.4     | 0.002     | 118          |
| Very Low Density Residential | B     | 69  | 1.9     | 0.003     | 132          |
| Very Low Density Residential | B/D   | 69  | 0.1     | 0.000     | 6            |
| Very Low Density Residential | C     | 79  | 2.2     | 0.003     | 174          |
| Very Low Density Residential | D     | 84  | 1.9     | 0.003     | 156          |
| <b>Totals =</b>              |       |     | 21.47   | 0.034     | 1749.2       |

Total (weighted) RCN = total product/total area = 81.45

RCN used = 81

**Subbasin: FS - 10B**

| Landuse                        | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|--------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                | Group |     |                 |                   |                            |
| Right-Of-Way                   | A     | 83  | 1.6             | 0.002             | 132                        |
| Right-Of-Way                   | B     | 89  | 2.1             | 0.003             | 187                        |
| Right-Of-Way                   | B/D   | 89  | 4.3             | 0.007             | 383                        |
| Right-Of-Way                   | C     | 92  | 2.5             | 0.004             | 228                        |
| Right-Of-Way                   | D     | 93  | 0.0             | 0.000             | 0                          |
| Mixed Use/Office/Institutional | B     | 85  | 1.6             | 0.002             | 134                        |
| Mixed Use/Office/Institutional | C     | 90  | 0.3             | 0.000             | 27                         |
| Mixed Use/Office/Institutional | D     | 92  | 0.6             | 0.001             | 55                         |
| High Density Residential       | A     | 61  | 0.1             | 0.000             | 4                          |
| High Density Residential       | C     | 83  | 0.3             | 0.000             | 26                         |
| High Density Residential       | D     | 87  | 0.1             | 0.000             | 8                          |
| Medium Density Residential     | A     | 54  | 0.1             | 0.000             | 5                          |
| Medium Density Residential     | B/D   | 70  | 0.8             | 0.001             | 55                         |
| Medium Density Residential     | D     | 85  | 0.4             | 0.001             | 34                         |
| Low Density Residential        | B     | 68  | 0.6             | 0.001             | 38                         |
| Low Density Residential        | B/D   | 68  | 5.3             | 0.008             | 358                        |
| Low Density Residential        | D     | 79  | 0.3             | 0.000             | 20                         |
| Very Low Density Residential   | A     | 49  | 8.3             | 0.013             | 405                        |
| Very Low Density Residential   | B     | 69  | 17.7            | 0.028             | 1222                       |
| Very Low Density Residential   | B/D   | 69  | 36.7            | 0.057             | 2533                       |
| Very Low Density Residential   | C     | 79  | 9.7             | 0.015             | 769                        |
| Very Low Density Residential   | D     | 84  | 4.8             | 0.008             | 405                        |
| Open Space, Good Condition     | D     | 80  | 0.0             | 0.000             | 0                          |
| <b>Totals =</b>                |       |     | 98.04           | 0.153             | 7029.4                     |

Total (weighted) RCN = total product/total area = 71.70

RCN used = 72

**Subbasin: FS - 10C**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 3.8             | 0.006             | 334                        |
| Right-Of-Way                 | C     | 92  | 1.1             | 0.002             | 98                         |
| Right-Of-Way                 | D     | 93  | 0.8             | 0.001             | 77                         |
| Medium Density Residential   | B     | 70  | 9.5             | 0.015             | 663                        |
| Medium Density Residential   | B/D   | 70  | 5.7             | 0.009             | 396                        |
| Medium Density Residential   | C     | 80  | 4.1             | 0.006             | 327                        |
| Medium Density Residential   | D     | 85  | 6.3             | 0.010             | 536                        |
| Low Density Residential      | B     | 68  | 12.4            | 0.019             | 846                        |
| Low Density Residential      | B/D   | 68  | 6.5             | 0.010             | 440                        |
| Low Density Residential      | C     | 79  | 0.2             | 0.000             | 15                         |
| Low Density Residential      | D     | 84  | 4.6             | 0.007             | 385                        |
| Very Low Density Residential | D     | 84  | 0.3             | 0.001             | 28                         |
| Open Space, Good Condition   | B     | 61  | 0.5             | 0.001             | 28                         |
| Open Space, Good Condition   | B/D   | 61  | 5.3             | 0.008             | 325                        |
| Open Space, Good Condition   | D     | 80  | 4.5             | 0.007             | 363                        |
| <b>Totals =</b>              |       |     | 65.50           | 0.102             | 4860.3                     |

Total (weighted) RCN = total product/total area = 74.20

RCN used = 74

**Subbasin: FS - 10D**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 8.2             | 0.013             | 729                        |
| Right-Of-Way                 | C     | 92  | 9.1             | 0.014             | 837                        |
| Right-Of-Way                 | D     | 93  | 5.2             | 0.008             | 488                        |
| Medium Density Residential   | B     | 70  | 9.7             | 0.015             | 679                        |
| Medium Density Residential   | B/D   | 70  | 0.2             | 0.000             | 15                         |
| Medium Density Residential   | C     | 80  | 30.9            | 0.048             | 2470                       |
| Medium Density Residential   | D     | 85  | 13.6            | 0.021             | 1156                       |
| Low Density Residential      | B     | 68  | 25.0            | 0.039             | 1702                       |
| Low Density Residential      | B/D   | 68  | 0.0             | 0.000             | 3                          |
| Low Density Residential      | C     | 79  | 6.5             | 0.010             | 514                        |
| Low Density Residential      | D     | 84  | 4.3             | 0.007             | 360                        |
| Very Low Density Residential | B     | 69  | 0.5             | 0.001             | 32                         |
| Very Low Density Residential | C     | 79  | 1.7             | 0.003             | 136                        |
| Very Low Density Residential | D     | 84  | 0.1             | 0.000             | 9                          |
| Open Space, Good Condition   | B     | 61  | 0.0             | 0.000             | 2                          |
| Open Space, Good Condition   | C     | 74  | 0.5             | 0.001             | 35                         |
| Open Space, Good Condition   | D     | 80  | 0.1             | 0.000             | 8                          |
| <b>Totals =</b>              |       |     | 115.67          | 0.181             | 9173.9                     |

Total (weighted) RCN = total product/total area = 79.31

RCN used = 79

**Subbasin: FS - 10E**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 0.4             | 0.001             | 35                         |
| Right-Of-Way                 | B/D   | 89  | 1.5             | 0.002             | 138                        |
| Right-Of-Way                 | C     | 92  | 0.9             | 0.001             | 83                         |
| Commercial                   | D     | 95  | 0.0             | 0.000             | 2                          |
| Medium Density Residential   | B     | 70  | 1.2             | 0.002             | 85                         |
| Medium Density Residential   | B/D   | 70  | 8.3             | 0.013             | 583                        |
| Medium Density Residential   | C     | 80  | 2.9             | 0.004             | 230                        |
| Medium Density Residential   | D     | 85  | 0.1             | 0.000             | 6                          |
| Low Density Residential      | B     | 68  | 0.4             | 0.001             | 28                         |
| Low Density Residential      | B/D   | 68  | 4.8             | 0.008             | 328                        |
| Low Density Residential      | C     | 79  | 4.8             | 0.008             | 383                        |
| Low Density Residential      | D     | 84  | 3.1             | 0.005             | 264                        |
| Very Low Density Residential | D     | 84  | 0.2             | 0.000             | 20                         |
| Open Space, Good Condition   | B/D   | 61  | 6.1             | 0.010             | 374                        |
| Open Space, Good Condition   | D     | 80  | 7.1             | 0.011             | 565                        |
| <b>Totals =</b>              |       |     | 41.98           | 0.066             | 3121.5                     |

Total (weighted) RCN = total product/total area = 74.35

RCN used = 74

**Subbasin: FS - 10F**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 0.5             | 0.001             | 46                         |
| Right-Of-Way                 | C     | 92  | 0.6             | 0.001             | 58                         |
| Commercial                   | B     | 92  | 0.5             | 0.001             | 49                         |
| Commercial                   | C     | 94  | 1.3             | 0.002             | 119                        |
| Very Low Density Residential | B     | 69  | 11.6            | 0.018             | 803                        |
| Very Low Density Residential | B/D   | 69  | 9.9             | 0.015             | 681                        |
| Very Low Density Residential | C     | 79  | 4.0             | 0.006             | 316                        |
| Very Low Density Residential | D     | 84  | 7.0             | 0.011             | 584                        |
| Open Space, Good Condition   | A     | 39  | 13.3            | 0.021             | 520                        |
| Open Space, Good Condition   | B/D   | 61  | 28.1            | 0.044             | 1714                       |
| Open Space, Good Condition   | C     | 74  | 13.3            | 0.021             | 986                        |
| Open Space, Good Condition   | D     | 80  | 8.2             | 0.013             | 658                        |
| <b>Totals =</b>              |       |     | 98.39           | 0.154             | 6534.7                     |

Total (weighted) RCN = total product/total area = 66.42

RCN used = 66



**Subbasin: FSUT1 - 1A**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B     | 89  | 2.3             | 0.004             | 208                        |
| Right-Of-Way                      | B/D   | 89  | 6.1             | 0.009             | 540                        |
| Right-Of-Way                      | C     | 92  | 3.3             | 0.005             | 306                        |
| Right-Of-Way                      | D     | 93  | 2.0             | 0.003             | 185                        |
| Commercial                        | B     | 92  | 0.6             | 0.001             | 55                         |
| Commercial                        | B/D   | 92  | 6.4             | 0.010             | 593                        |
| Commercial                        | C     | 94  | 1.1             | 0.002             | 101                        |
| Commercial                        | D     | 95  | 2.5             | 0.004             | 242                        |
| Office/Institutional/Multi-Family | B     | 85  | 6.3             | 0.010             | 537                        |
| Office/Institutional/Multi-Family | B/D   | 85  | 12.3            | 0.019             | 1046                       |
| Office/Institutional/Multi-Family | C     | 90  | 7.9             | 0.012             | 709                        |
| Office/Institutional/Multi-Family | D     | 92  | 0.0             | 0.000             | 0                          |
| Very Low Density Residential      | B     | 69  | 7.6             | 0.012             | 523                        |
| Very Low Density Residential      | B/D   | 69  | 28.3            | 0.044             | 1951                       |
| Very Low Density Residential      | C     | 79  | 9.0             | 0.014             | 708                        |
| Very Low Density Residential      | D     | 84  | 20.0            | 0.031             | 1677                       |
| Open Space, Good Condition        | B     | 61  | 9.0             | 0.014             | 549                        |
| Open Space, Good Condition        | B/D   | 61  | 58.2            | 0.091             | 3548                       |
| Open Space, Good Condition        | C     | 74  | 12.1            | 0.019             | 894                        |
| Open Space, Good Condition        | D     | 80  | 62.8            | 0.098             | 5025                       |
| <b>Totals =</b>                   |       |     | 257.73          | 0.403             | 19397.5                    |

**Total (weighted) RCN = total product/total area = 75.26**

**RCN used = 75**

**Subbasin: FSUT1 - 1B**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B     | 89  | 1.7             | 0.003             | 156                        |
| Right-Of-Way                      | B/D   | 89  | 0.8             | 0.001             | 71                         |
| Right-Of-Way                      | C     | 92  | 3.3             | 0.005             | 302                        |
| Right-Of-Way                      | D     | 93  | 3.8             | 0.006             | 357                        |
| Commercial                        | B     | 92  | 3.5             | 0.006             | 326                        |
| Commercial                        | C     | 94  | 5.1             | 0.008             | 477                        |
| Office/Institutional/Multi-Family | B     | 85  | 4.2             | 0.007             | 359                        |
| Office/Institutional/Multi-Family | C     | 90  | 1.4             | 0.002             | 124                        |
| Office/Institutional/Multi-Family | D     | 92  | 0.4             | 0.001             | 33                         |
| Very Low Density Residential      | B     | 69  | 12.2            | 0.019             | 843                        |
| Very Low Density Residential      | B/D   | 69  | 19.8            | 0.031             | 1367                       |
| Very Low Density Residential      | C     | 79  | 79.4            | 0.124             | 6271                       |
| Very Low Density Residential      | D     | 84  | 101.6           | 0.159             | 8534                       |
| Very Low Density Residential      | W     | 100 | 0.9             | 0.001             | 90                         |
| Open Space, Good Condition        | B     | 61  | 3.6             | 0.006             | 218                        |
| Open Space, Good Condition        | B/D   | 61  | 2.6             | 0.004             | 157                        |
| Open Space, Good Condition        | C     | 74  | 6.5             | 0.010             | 481                        |
| Open Space, Good Condition        | D     | 80  | 1.4             | 0.002             | 111                        |
| <b>Totals =</b>                   |       |     | 252.21          | 0.394             | 20279.0                    |

**Total (weighted) RCN = total product/total area = 80.40**

**RCN used = 80**

**Subbasin: FSUT1 - 1C**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 1.6     | 0.002     | 139          |
| Right-Of-Way                      | B/D   | 89  | 0.1     | 0.000     | 5            |
| Right-Of-Way                      | C     | 92  | 2.1     | 0.003     | 191          |
| Right-Of-Way                      | D     | 93  | 0.2     | 0.000     | 14           |
| Commercial                        | B     | 92  | 0.3     | 0.000     | 25           |
| Office/Institutional/Medical      | C     | 90  | 1.2     | 0.002     | 109          |
| Office/Institutional/Medical      | D     | 92  | 0.5     | 0.001     | 48           |
| Office/Institutional/Multi-Family | B     | 85  | 5.1     | 0.008     | 436          |
| Office/Institutional/Multi-Family | B/D   | 85  | 1.8     | 0.003     | 151          |
| Office/Institutional/Multi-Family | C     | 90  | 1.3     | 0.002     | 114          |
| Office/Institutional/Multi-Family | D     | 92  | 0.8     | 0.001     | 73           |
| High Density Residential          | B/D   | 75  | 0.0     | 0.000     | 2            |
| High Density Residential          | C     | 83  | 0.1     | 0.000     | 10           |
| Very Low Density Residential      | B     | 69  | 5.8     | 0.009     | 400          |
| Very Low Density Residential      | B/D   | 69  | 0.2     | 0.000     | 16           |
| Very Low Density Residential      | C     | 79  | 1.6     | 0.003     | 127          |
| Very Low Density Residential      | D     | 84  | 0.0     | 0.000     | 1            |
| Open Space, Good Condition        | B     | 61  | 45.4    | 0.071     | 2769         |
| Open Space, Good Condition        | B/D   | 61  | 6.8     | 0.011     | 416          |
| Open Space, Good Condition        | C     | 74  | 35.8    | 0.056     | 2653         |
| Open Space, Good Condition        | D     | 80  | 61.2    | 0.096     | 4897         |
| <b>Totals =</b>                   |       |     | 171.87  | 0.269     | 12594.7      |

**Total (weighted) RCN = total product/total area = 73.28**

**RCN used = 73**

**Subbasin: FSUT1-2A**

| Landuse                    | Soil  |     | Area    | Area      | Product of   |
|----------------------------|-------|-----|---------|-----------|--------------|
|                            | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way               | B     | 89  | 0.0     | 0.000     | 1            |
| Right-Of-Way               | B/D   | 89  | 0.6     | 0.001     | 50           |
| Open Space, Good Condition | B     | 61  | 10.9    | 0.017     | 666          |
| Open Space, Good Condition | B/D   | 61  | 110.4   | 0.173     | 6736         |
| Open Space, Good Condition | C     | 74  | 105.2   | 0.164     | 7783         |
| Open Space, Good Condition | D     | 80  | 62.3    | 0.097     | 4986         |
| <b>Totals =</b>            |       |     | 289.43  | 0.452     | 20222.7      |

**Total (weighted) RCN = total product/total area = 69.87**

**RCN used = 70**

**Subbasin: FSUT1-2B**

| Landuse                    | Soil  |     | Area    | Area      | Product of   |
|----------------------------|-------|-----|---------|-----------|--------------|
|                            | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way               | C     | 92  | 0.7     | 0.001     | 60           |
| High Density Residential   | B     | 75  | 0.6     | 0.001     | 48           |
| High Density Residential   | B/D   | 75  | 9.7     | 0.015     | 726          |
| High Density Residential   | C     | 83  | 39.9    | 0.062     | 3312         |
| High Density Residential   | D     | 87  | 0.9     | 0.001     | 76           |
| Open Space, Good Condition | B     | 61  | 14.0    | 0.022     | 853          |
| Open Space, Good Condition | C     | 74  | 82.0    | 0.128     | 6068         |
| Open Space, Good Condition | D     | 80  | 5.9     | 0.009     | 469          |
| <b>Totals =</b>            |       |     | 153.57  | 0.240     | 11610.3      |

**Total (weighted) RCN = total product/total area = 75.60**

**RCN used = 76**

### Subbasin: FSUT1-2C

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | A     | 83  | 0.3     | 0.000     | 24           |
| Right-Of-Way                 | A/D   | 83  | 1.9     | 0.003     | 159          |
| Right-Of-Way                 | B     | 89  | 0.9     | 0.001     | 76           |
| Right-Of-Way                 | B/D   | 89  | 1.6     | 0.003     | 143          |
| Right-Of-Way                 | C     | 92  | 5.2     | 0.008     | 482          |
| Commercial                   | B/D   | 92  | 1.1     | 0.002     | 97           |
| Commercial                   | C     | 94  | 1.1     | 0.002     | 99           |
| High Density Residential     | A     | 61  | 0.8     | 0.001     | 46           |
| High Density Residential     | B     | 75  | 1.2     | 0.002     | 89           |
| High Density Residential     | B/D   | 75  | 0.3     | 0.001     | 26           |
| High Density Residential     | C     | 83  | 0.2     | 0.000     | 19           |
| Medium Density Residential   | A     | 54  | 0.1     | 0.000     | 5            |
| Medium Density Residential   | A/D   | 54  | 12.5    | 0.019     | 674          |
| Medium Density Residential   | B     | 70  | 2.4     | 0.004     | 171          |
| Medium Density Residential   | B/D   | 70  | 9.0     | 0.014     | 630          |
| Medium Density Residential   | C     | 80  | 21.8    | 0.034     | 1742         |
| Low Density Residential      | B     | 68  | 0.0     | 0.000     | 1            |
| Low Density Residential      | C     | 79  | 2.8     | 0.004     | 218          |
| Low Density Residential      | D     | 84  | 0.8     | 0.001     | 68           |
| Very Low Density Residential | A     | 49  | 0.4     | 0.001     | 18           |
| Very Low Density Residential | A/D   | 49  | 4.7     | 0.007     | 231          |
| Very Low Density Residential | B/D   | 69  | 1.1     | 0.002     | 79           |
| Very Low Density Residential | C     | 79  | 0.9     | 0.001     | 75           |
| <b>Totals =</b>              |       |     | 71.09   | 0.111     | 5172.8       |

**Total (weighted) RCN = total product/total area = 72.76**

**RCN used = 73**

### Subbasin: FSUT1-2D

| Landuse                    | Soil  |     | Area    | Area      | Product of   |
|----------------------------|-------|-----|---------|-----------|--------------|
|                            | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way               | A     | 83  | 0.2     | 0.000     | 21           |
| Right-Of-Way               | A/D   | 89  | 3.5     | 0.005     | 307          |
| Right-Of-Way               | B     | 89  | 0.6     | 0.001     | 55           |
| Right-Of-Way               | B/D   | 92  | 5.4     | 0.008     | 498          |
| Right-Of-Way               | C     | 93  | 0.6     | 0.001     | 52           |
| Commercial                 | B/D   | 92  | 0.0     | 0.000     | 2            |
| Commercial                 | C     | 94  | 0.4     | 0.001     | 33           |
| High Density Residential   | A     | 75  | 0.0     | 0.000     | 0            |
| Medium Density Residential | B     | 54  | 0.7     | 0.001     | 39           |
| Medium Density Residential | B/D   | 70  | 19.9    | 0.031     | 1394         |
| Medium Density Residential | C     | 70  | 2.1     | 0.003     | 144          |
| Medium Density Residential | A     | 80  | 16.5    | 0.026     | 1317         |
| Medium Density Residential | A/D   | 85  | 6.2     | 0.010     | 529          |
| Very Low Residential       | B     | 69  | 7.7     | 0.012     | 529          |
| Very Low Residential       | B/D   | 79  | 16.5    | 0.026     | 1306         |
| Very Low Residential       | C     | 84  | 3.0     | 0.005     | 253          |
| Open Space, Good Condition | B     | 61  | 1.3     | 0.002     | 82           |
| Open Space, Good Condition | C     | 61  | 0.0     | 0.000     | 1            |
| Open Space, Good Condition | D     | 74  | 19.5    | 0.030     | 1444         |
| Open Space, Good Condition | A     | 80  | 9.9     | 0.015     | 791          |
| <b>Totals =</b>            |       |     | 114.03  | 0.178     | 8797.9       |

**Total (weighted) RCN = total product/total area = 77.16**

**RCN used = 77**

**Subbasin: FSUT1-2E**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 1.2             | 0.002             | 100                        |
| Right-Of-Way                 | A/D   | 83  | 0.4             | 0.001             | 32                         |
| Right-Of-Way                 | B     | 89  | 3.8             | 0.006             | 342                        |
| Right-Of-Way                 | B/D   | 89  | 0.2             | 0.000             | 21                         |
| Right-Of-Way                 | C     | 92  | 1.7             | 0.003             | 153                        |
| Office/Institutional/Medical | A/D   | 77  | 2.4             | 0.004             | 186                        |
| Office/Institutional/Medical | B     | 85  | 14.7            | 0.023             | 1253                       |
| Office/Institutional/Medical | C     | 90  | 6.4             | 0.010             | 578                        |
| Office/Institutional/Medical | D     | 92  | 2.8             | 0.004             | 262                        |
| Medium Density Residential   | A     | 54  | 4.8             | 0.008             | 262                        |
| Medium Density Residential   | B     | 70  | 11.6            | 0.018             | 815                        |
| Medium Density Residential   | B/D   | 70  | 2.4             | 0.004             | 166                        |
| Medium Density Residential   | C     | 80  | 4.1             | 0.006             | 326                        |
| Medium Density Residential   | D     | 85  | 4.9             | 0.008             | 418                        |
| Very Low Density Residential | B     | 69  | 0.0             | 0.000             | 0                          |
| Very Low Density Residential | C     | 79  | 0.0             | 0.000             | 0                          |
| Open Space, Good Condition   | A/D   | 39  | 0.1             | 0.000             | 3                          |
| Open Space, Good Condition   | B     | 61  | 5.4             | 0.008             | 329                        |
| Open Space, Good Condition   | C     | 74  | 19.4            | 0.030             | 1437                       |
| Open Space, Good Condition   | D     | 80  | 19.8            | 0.031             | 1581                       |
| <b>Totals =</b>              |       |     | 106.30          | 0.166             | 8265.7                     |

Total (weighted) RCN = total product/total area = 77.76

RCN used = 78

**Subbasin: FSUT1-2F**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | A     | 83  | 0.5             | 0.001             | 37                         |
| Right-Of-Way               | B     | 89  | 0.2             | 0.000             | 15                         |
| Right-Of-Way               | C     | 92  | 0.3             | 0.000             | 24                         |
| Right-Of-Way               | D     | 93  | 0.1             | 0.000             | 5                          |
| Medium Density Residential | A     | 54  | 3.8             | 0.006             | 205                        |
| Medium Density Residential | C     | 80  | 4.2             | 0.007             | 337                        |
| Medium Density Residential | D     | 85  | 2.4             | 0.004             | 207                        |
| Open Space, Good Condition | B     | 61  | 8.7             | 0.014             | 532                        |
| Open Space, Good Condition | C     | 74  | 25.6            | 0.040             | 1895                       |
| Open Space, Good Condition | D     | 80  | 21.9            | 0.034             | 1756                       |
| <b>Totals =</b>            |       |     | 67.66           | 0.106             | 5013.2                     |

Total (weighted) RCN = total product/total area = 74.10

RCN used = 74

**Subbasin: FSUT1-2G**

| Landuse                        | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|--------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                | Group |     |                 |                   |                            |
| Right-Of-Way                   | B     | 89  | 1.3             | 0.002             | 115                        |
| Right-Of-Way                   | C     | 92  | 1.5             | 0.002             | 138                        |
| Right-Of-Way                   | D     | 93  | 3.2             | 0.005             | 301                        |
| Mixed Use/Office/Institutional | B     | 85  | 4.8             | 0.008             | 408                        |
| Mixed Use/Office/Institutional | D     | 92  | 5.1             | 0.008             | 465                        |
| Medium Density Residential     | D     | 85  | 0.0             | 0.000             | 0                          |
| Very Low Density Residential   | B     | 69  | 4.7             | 0.007             | 324                        |
| Very Low Density Residential   | C     | 79  | 8.3             | 0.013             | 655                        |
| Very Low Density Residential   | D     | 84  | 29.3            | 0.046             | 2465                       |
| <b>Totals =</b>                |       |     | 58.21           | 0.091             | 4870.4                     |

Total (weighted) RCN = total product/total area = 83.67

RCN used = 84

**Subbasin: FSUT1-3**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | A     | 83  | 2.3     | 0.004     | 194          |
| Right-Of-Way                 | B     | 89  | 0.8     | 0.001     | 67           |
| Right-Of-Way                 | B/D   | 89  | 0.1     | 0.000     | 7            |
| Right-Of-Way                 | C     | 92  | 0.4     | 0.001     | 34           |
| Right-Of-Way                 | D     | 93  | 0.6     | 0.001     | 54           |
| High Density Residential     | B     | 75  | 0.0     | 0.000     | 0            |
| Medium Density Residential   | A     | 54  | 0.1     | 0.000     | 8            |
| Medium Density Residential   | B     | 70  | 0.6     | 0.001     | 39           |
| Medium Density Residential   | B/D   | 70  | 0.5     | 0.001     | 32           |
| Medium Density Residential   | C     | 80  | 0.0     | 0.000     | 1            |
| Medium Density Residential   | D     | 85  | 0.1     | 0.000     | 10           |
| Low Density Residential      | D     | 84  | 0.0     | 0.000     | 1            |
| Very Low Density Residential | A     | 49  | 8.9     | 0.014     | 438          |
| Very Low Density Residential | B     | 69  | 1.3     | 0.002     | 89           |
| Very Low Density Residential | B/D   | 69  | 16.3    | 0.025     | 1125         |
| Very Low Density Residential | C     | 79  | 0.1     | 0.000     | 7            |
| Very Low Density Residential | D     | 84  | 4.4     | 0.007     | 367          |
| Open Space, Good Condition   | A     | 39  | 4.9     | 0.008     | 192          |
| Open Space, Good Condition   | B     | 61  | 9.5     | 0.015     | 581          |
| Open Space, Good Condition   | B/D   | 61  | 39.4    | 0.062     | 2401         |
| Open Space, Good Condition   | C     | 74  | 25.6    | 0.040     | 1894         |
| Open Space, Good Condition   | D     | 80  | 4.0     | 0.006     | 322          |
| <b>Totals =</b>              |       |     | 119.87  | 0.187     | 7864.7       |

**Total (weighted) RCN = total product/total area = 65.61**

**RCN used = 66**

**Subbasin: FSUT2-1**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | A     | 83  | 1.2     | 0.002     | 100          |
| Right-Of-Way                 | B/D   | 89  | 3.5     | 0.005     | 308          |
| Right-Of-Way                 | C     | 92  | 9.6     | 0.015     | 880          |
| Right-Of-Way                 | W     | 100 | 0.1     | 0.000     | 10           |
| Commercial                   | B/D   | 92  | 1.9     | 0.003     | 170          |
| Commercial                   | C     | 94  | 8.6     | 0.013     | 806          |
| Office/Institutional/Medical | B/D   | 85  | 0.9     | 0.001     | 78           |
| Office/Institutional/Medical | C     | 90  | 0.6     | 0.001     | 56           |
| Office/Institutional/Medical | W     | 100 | 0.4     | 0.001     | 35           |
| High Density Residential     | B/D   | 75  | 2.1     | 0.003     | 159          |
| High Density Residential     | C     | 83  | 0.7     | 0.001     | 57           |
| Medium Density Residential   | A     | 54  | 0.8     | 0.001     | 43           |
| Medium Density Residential   | B/D   | 70  | 15.5    | 0.024     | 1087         |
| Medium Density Residential   | C     | 80  | 7.6     | 0.012     | 604          |
| Open Space, Good Condition   | A     | 39  | 5.2     | 0.008     | 201          |
| Open Space, Good Condition   | C     | 74  | 28.5    | 0.044     | 2106         |
| <b>Totals =</b>              |       |     | 86.94   | 0.136     | 6699.8       |

**Total (weighted) RCN = total product/total area = 77.07**

**RCN used = 77**

**Subbasin: FSUT2-2**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B     | 89  | 0.0             | 0.000             | 1                          |
| Right-Of-Way               | C     | 92  | 0.3             | 0.000             | 27                         |
| Right-Of-Way               | D     | 93  | 1.0             | 0.002             | 90                         |
| High Density Residential   | B     | 75  | 0.0             | 0.000             | 1                          |
| High Density Residential   | B/D   | 75  | 0.2             | 0.000             | 12                         |
| High Density Residential   | C     | 83  | 1.1             | 0.002             | 87                         |
| High Density Residential   | D     | 87  | 2.3             | 0.004             | 200                        |
| Open Space, Good Condition | B     | 61  | 5.5             | 0.009             | 335                        |
| Open Space, Good Condition | C     | 74  | 3.9             | 0.006             | 289                        |
| Open Space, Good Condition | D     | 80  | 5.8             | 0.009             | 463                        |
| <b>Totals =</b>            |       |     | 19.98           | 0.031             | 1505.6                     |

Total (weighted) RCN = total product/total area = 75.34

RCN used = 75

**Subbasin: FSUT2-3**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 1.5             | 0.002             | 135                        |
| Right-Of-Way                 | B/D   | 89  | 1.9             | 0.003             | 172                        |
| Right-Of-Way                 | C     | 92  | 3.6             | 0.006             | 333                        |
| Right-Of-Way                 | D     | 93  | 0.1             | 0.000             | 6                          |
| Commercial                   | C     | 94  | 0.0             | 0.000             | 1                          |
| High Density Residential     | B     | 75  | 4.3             | 0.007             | 324                        |
| High Density Residential     | B/D   | 75  | 0.1             | 0.000             | 5                          |
| High Density Residential     | C     | 83  | 0.1             | 0.000             | 7                          |
| High Density Residential     | D     | 87  | 1.2             | 0.002             | 103                        |
| Very Low Density Residential | B/D   | 69  | 6.3             | 0.010             | 435                        |
| Very Low Density Residential | C     | 79  | 6.6             | 0.010             | 518                        |
| Very Low Density Residential | D     | 84  | 0.8             | 0.001             | 69                         |
| Open Space, Good Condition   | B     | 61  | 9.7             | 0.015             | 593                        |
| Open Space, Good Condition   | B/D   | 61  | 27.0            | 0.042             | 1649                       |
| Open Space, Good Condition   | C     | 74  | 67.8            | 0.106             | 5019                       |
| Open Space, Good Condition   | D     | 80  | 6.5             | 0.010             | 516                        |
| <b>Totals =</b>              |       |     | 137.53          | 0.215             | 9886.9                     |

Total (weighted) RCN = total product/total area = 71.89

RCN used = 72

**Subbasin: FSUT2-4**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 1.2             | 0.002             | 104                        |
| Right-Of-Way                 | B/D   | 89  | 2.6             | 0.004             | 228                        |
| Right-Of-Way                 | C     | 92  | 5.8             | 0.009             | 530                        |
| Right-Of-Way                 | D     | 93  | 2.2             | 0.003             | 207                        |
| Commercial                   | B/D   | 92  | 7.8             | 0.012             | 714                        |
| Commercial                   | C     | 94  | 8.5             | 0.013             | 794                        |
| High Density Residential     | B     | 75  | 2.4             | 0.004             | 180                        |
| High Density Residential     | B/D   | 75  | 16.0            | 0.025             | 1199                       |
| High Density Residential     | C     | 83  | 3.0             | 0.005             | 250                        |
| High Density Residential     | D     | 87  | 9.2             | 0.014             | 800                        |
| Very Low Density Residential | C     | 79  | 0.5             | 0.001             | 42                         |
| Open Space, Good Condition   | B     | 61  | 2.4             | 0.004             | 145                        |
| Open Space, Good Condition   | B/D   | 61  | 6.1             | 0.010             | 374                        |
| Open Space, Good Condition   | C     | 74  | 11.0            | 0.017             | 814                        |
| Open Space, Good Condition   | D     | 80  | 10.1            | 0.016             | 810                        |
| <b>Totals =</b>              |       |     | 88.72           | 0.139             | 7193.9                     |

Total (weighted) RCN = total product/total area = 81.09

RCN used = 81

**Subbasin: FSUT2-5**

| Landuse                        | Soil  |     | Area    | Area      | Product of   |
|--------------------------------|-------|-----|---------|-----------|--------------|
|                                | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                   | B     | 89  | 3.0     | 0.005     | 269          |
| Right-Of-Way                   | B/D   | 89  | 9.5     | 0.015     | 848          |
| Right-Of-Way                   | C     | 92  | 7.1     | 0.011     | 653          |
| Right-Of-Way                   | D     | 93  | 0.2     | 0.000     | 22           |
| Commercial                     | B     | 92  | 0.5     | 0.001     | 46           |
| Commercial                     | B/D   | 92  | 14.6    | 0.023     | 1340         |
| Commercial                     | C     | 94  | 19.9    | 0.031     | 1875         |
| Commercial                     | D     | 95  | 0.9     | 0.001     | 83           |
| Mixed Use/Office/Institutional | B/D   | 85  | 0.9     | 0.001     | 77           |
| Very Low Density Residential   | B/D   | 69  | 6.9     | 0.011     | 474          |
| Very Low Density Residential   | C     | 79  | 19.6    | 0.031     | 1546         |
| Very Low Density Residential   | D     | 84  | 0.6     | 0.001     | 48           |
| Open Space, Good Condition     | B     | 61  | 9.8     | 0.015     | 595          |
| Open Space, Good Condition     | B/D   | 61  | 16.3    | 0.025     | 993          |
| Open Space, Good Condition     | C     | 74  | 12.6    | 0.020     | 935          |
| Open Space, Good Condition     | D     | 80  | 13.9    | 0.022     | 1113         |
| <b>Totals =</b>                |       |     | 136.26  | 0.213     | 10916.6      |

Total (weighted) RCN = total product/total area = 80.11

RCN used = 80

**Subbasin: FSUT2-6**

| Landuse                        | Soil  |     | Area    | Area      | Product of   |
|--------------------------------|-------|-----|---------|-----------|--------------|
|                                | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                   | B     | 89  | 7.4     | 0.012     | 660          |
| Right-Of-Way                   | B/D   | 89  | 3.3     | 0.005     | 291          |
| Right-Of-Way                   | C     | 92  | 8.3     | 0.013     | 766          |
| Right-Of-Way                   | D     | 93  | 8.9     | 0.014     | 830          |
| Commercial                     | B     | 92  | 17.9    | 0.028     | 1649         |
| Commercial                     | B/D   | 92  | 2.4     | 0.004     | 218          |
| Commercial                     | C     | 94  | 13.2    | 0.021     | 1245         |
| Commercial                     | D     | 92  | 14.5    | 0.023     | 1332         |
| Commercial                     | W     | 100 | 0.6     | 0.001     | 58           |
| Mixed Use/Office/Institutional | B     | 85  | 0.5     | 0.001     | 43           |
| Mixed Use/Office/Institutional | C     | 90  | 1.0     | 0.001     | 86           |
| Mixed Use/Office/Institutional | D     | 92  | 3.4     | 0.005     | 313          |
| Office/Institutional/Medical   | B     | 85  | 0.1     | 0.000     | 10           |
| Office/Institutional/Medical   | D     | 92  | 0.5     | 0.001     | 50           |
| Low Density Residential        | B     | 68  | 8.0     | 0.013     | 544          |
| Low Density Residential        | B/D   | 68  | 0.3     | 0.000     | 21           |
| Low Density Residential        | C     | 79  | 5.3     | 0.008     | 416          |
| Low Density Residential        | D     | 84  | 19.5    | 0.030     | 1636         |
| Very Low Density Residential   | B     | 69  | 2.0     | 0.003     | 137          |
| Very Low Density Residential   | B/D   | 69  | 0.6     | 0.001     | 41           |
| Very Low Density Residential   | C     | 79  | 14.6    | 0.023     | 1152         |
| Very Low Density Residential   | D     | 84  | 10.3    | 0.016     | 862          |
| Very Low Density Residential   | W     | 100 | 0.3     | 0.000     | 26           |
| Open Space, Good Condition     | B     | 61  | 16.3    | 0.025     | 992          |
| Open Space, Good Condition     | B/D   | 61  | 5.5     | 0.009     | 338          |
| Open Space, Good Condition     | C     | 74  | 22.5    | 0.035     | 1668         |
| Open Space, Good Condition     | D     | 80  | 12.8    | 0.020     | 1021         |
| <b>Totals =</b>                |       |     | 199.87  | 0.312     | 16402.9      |

Total (weighted) RCN = total product/total area = 82.07

RCN used = 82

**Subbasin: FSUT2-7A**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B     | 89  | 5.0     | 0.008     | 441          |
| Right-Of-Way                 | C     | 92  | 6.3     | 0.010     | 582          |
| Right-Of-Way                 | D     | 93  | 2.4     | 0.004     | 219          |
| Commercial                   | B/D   | 92  | 0.0     | 0.000     | 1            |
| Office/Institutional/Medical | C     | 90  | 5.0     | 0.008     | 451          |
| Office/Institutional/Medical | D     | 92  | 2.2     | 0.003     | 202          |
| High Density Residential     | B     | 75  | 0.3     | 0.000     | 19           |
| High Density Residential     | C     | 83  | 4.0     | 0.006     | 328          |
| High Density Residential     | D     | 87  | 0.9     | 0.001     | 74           |
| Medium Density Residential   | B     | 70  | 8.9     | 0.014     | 622          |
| Medium Density Residential   | C     | 80  | 11.6    | 0.018     | 932          |
| Medium Density Residential   | D     | 85  | 7.2     | 0.011     | 614          |
| Very Low Density Residential | B     | 69  | 6.9     | 0.011     | 476          |
| Very Low Density Residential | C     | 79  | 3.4     | 0.005     | 266          |
| Very Low Density Residential | D     | 84  | 2.0     | 0.003     | 170          |
| Open Space, Good Condition   | B     | 61  | 12.3    | 0.019     | 748          |
| Open Space, Good Condition   | B/D   | 61  | 6.7     | 0.011     | 410          |
| Open Space, Good Condition   | C     | 74  | 37.9    | 0.059     | 2804         |
| Open Space, Good Condition   | D     | 80  | 1.8     | 0.003     | 143          |
| <b>Totals =</b>              |       |     | 124.59  | 0.195     | 9499.4       |

**Total (weighted) RCN = total product/total area = 76.25**

**RCN used = 76**



**Subbasin: FSUT2-7B**

| Landuse                        | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|--------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                | Group |     |                 |                   |                            |
| Right-Of-Way                   | A     | 83  | 0.7             | 0.001             | 55                         |
| Right-Of-Way                   | B     | 89  | 13.1            | 0.020             | 1167                       |
| Right-Of-Way                   | B/D   | 89  | 5.8             | 0.009             | 515                        |
| Right-Of-Way                   | C     | 92  | 8.1             | 0.013             | 743                        |
| Right-Of-Way                   | C/D   | 92  | 0.3             | 0.000             | 29                         |
| Right-Of-Way                   | D     | 93  | 2.1             | 0.003             | 194                        |
| Right-Of-Way                   | W     | 100 | 0.0             | 0.000             | 4                          |
| Commercial                     | B     | 92  | 6.5             | 0.010             | 600                        |
| Commercial                     | B/D   | 92  | 6.0             | 0.009             | 554                        |
| Commercial                     | C     | 94  | 5.2             | 0.008             | 489                        |
| Commercial                     | C/D   | 94  | 2.1             | 0.003             | 201                        |
| Commercial                     | D     | 95  | 0.2             | 0.000             | 20                         |
| Mixed Use/Office/Institutional | B     | 85  | 0.6             | 0.001             | 51                         |
| Mixed Use/Office/Institutional | C     | 90  | 0.8             | 0.001             | 72                         |
| Office/Institutional/Medical   | B/D   | 85  | 1.3             | 0.002             | 112                        |
| Office/Institutional/Medical   | C     | 90  | 0.6             | 0.001             | 50                         |
| High Density Residential       | A     | 61  | 0.3             | 0.000             | 19                         |
| High Density Residential       | B     | 75  | 5.3             | 0.008             | 398                        |
| High Density Residential       | B/D   | 75  | 8.6             | 0.013             | 645                        |
| High Density Residential       | C     | 83  | 2.4             | 0.004             | 198                        |
| High Density Residential       | W     | 100 | 0.2             | 0.000             | 18                         |
| Medium Density Residential     | B     | 70  | 13.8            | 0.022             | 965                        |
| Medium Density Residential     | B/D   | 70  | 2.9             | 0.005             | 204                        |
| Medium Density Residential     | C     | 80  | 5.2             | 0.008             | 419                        |
| Medium Density Residential     | D     | 85  | 6.0             | 0.009             | 507                        |
| Low Density Residential        | A     | 51  | 8.1             | 0.013             | 411                        |
| Low Density Residential        | B     | 68  | 27.3            | 0.043             | 1854                       |
| Low Density Residential        | B/D   | 68  | 16.4            | 0.026             | 1113                       |
| Low Density Residential        | C     | 79  | 29.2            | 0.046             | 2306                       |
| Low Density Residential        | C/D   | 79  | 2.0             | 0.003             | 158                        |
| Low Density Residential        | D     | 84  | 12.6            | 0.020             | 1057                       |
| Very Low Density Residential   | B     | 69  | 3.5             | 0.005             | 239                        |
| Very Low Density Residential   | B/D   | 69  | 0.5             | 0.001             | 34                         |
| Very Low Density Residential   | C     | 79  | 2.7             | 0.004             | 213                        |
| Very Low Density Residential   | C/D   | 79  | 1.0             | 0.002             | 80                         |
| Very Low Density Residential   | D     | 84  | 4.6             | 0.007             | 382                        |
| Open Space, Good Condition     | A     | 39  | 1.2             | 0.002             | 47                         |
| Open Space, Good Condition     | B     | 61  | 23.1            | 0.036             | 1410                       |
| Open Space, Good Condition     | B/D   | 61  | 8.3             | 0.013             | 509                        |
| Open Space, Good Condition     | C     | 74  | 14.9            | 0.023             | 1100                       |
| Open Space, Good Condition     | C/D   | 74  | 0.3             | 0.001             | 24                         |
| Open Space, Good Condition     | D     | 80  | 15.4            | 0.024             | 1235                       |
| <b>Totals =</b>                |       |     | 269.12          | 0.420             | 20402.6                    |

**Total (weighted) RCN = total product/total area = 75.81**

**RCN used = 76**

**Subbasin: FSUT2-8A**

| Landuse                      | Soil  | RCN | Area (Acres) | Area (Sq. Mi.) | Product of RCN and Area |
|------------------------------|-------|-----|--------------|----------------|-------------------------|
|                              | Group |     |              |                |                         |
| Right-Of-Way                 | B     | 89  | 10.4         | 0.016          | 929                     |
| Right-Of-Way                 | B/D   | 89  | 2.7          | 0.004          | 236                     |
| Right-Of-Way                 | C     | 92  | 11.6         | 0.018          | 1064                    |
| Right-Of-Way                 | D     | 93  | 5.4          | 0.008          | 500                     |
| Commercial                   | B     | 92  | 0.9          | 0.001          | 82                      |
| Medium Density Residential   | B     | 70  | 20.4         | 0.032          | 1429                    |
| Medium Density Residential   | B/D   | 70  | 9.8          | 0.015          | 685                     |
| Medium Density Residential   | C     | 80  | 39.4         | 0.062          | 3156                    |
| Medium Density Residential   | D     | 85  | 19.4         | 0.030          | 1646                    |
| Medium Density Residential   | W     | 100 | 0.3          | 0.001          | 33                      |
| Low Density Residential      | B     | 68  | 5.3          | 0.008          | 359                     |
| Low Density Residential      | C     | 79  | 1.2          | 0.002          | 97                      |
| Low Density Residential      | D     | 84  | 6.0          | 0.009          | 508                     |
| Very Low Density Residential | B     | 69  | 4.1          | 0.006          | 285                     |
| Very Low Density Residential | C     | 79  | 1.8          | 0.003          | 139                     |
| Very Low Density Residential | D     | 84  | 3.5          | 0.005          | 291                     |
| Open Space, Good Condition   | B     | 61  | 8.3          | 0.013          | 508                     |
| Open Space, Good Condition   | B/D   | 61  | 3.8          | 0.006          | 233                     |
| Open Space, Good Condition   | C     | 74  | 8.8          | 0.014          | 649                     |
| Open Space, Good Condition   | D     | 80  | 10.4         | 0.016          | 832                     |
| Totals =                     |       |     | 173.50       | 0.271          | 13661.4                 |

Total (weighted) RCN = total product/total area = 78.74

RCN used = 79

**Subbasin: FSUT2-8B**

| Landuse                           | Soil  | RCN | Area (Acres) | Area (Sq. Mi.) | Product of RCN and Area |
|-----------------------------------|-------|-----|--------------|----------------|-------------------------|
|                                   | Group |     |              |                |                         |
| Right-Of-Way                      | B     | 89  | 2.6          | 0.004          | 228                     |
| Right-Of-Way                      | B/D   | 89  | 0.1          | 0.000          | 8                       |
| Right-Of-Way                      | C     | 92  | 3.3          | 0.005          | 308                     |
| Right-Of-Way                      | C/D   | 92  | 0.8          | 0.001          | 73                      |
| Right-Of-Way                      | D     | 93  | 0.0          | 0.000          | 1                       |
| Commercial                        | B     | 92  | 0.2          | 0.000          | 18                      |
| Commercial                        | B/D   | 92  | 0.2          | 0.000          | 20                      |
| Commercial                        | C     | 94  | 4.6          | 0.007          | 435                     |
| Commercial                        | C/D   | 94  | 0.0          | 0.000          | 5                       |
| Office/Institutional/Medical      | B/D   | 85  | 0.7          | 0.001          | 61                      |
| Office/Institutional/Medical      | C     | 90  | 0.4          | 0.001          | 32                      |
| Office/Institutional/Multi-Family | B     | 85  | 0.0          | 0.000          | 3                       |
| Office/Institutional/Multi-Family | C     | 90  | 0.1          | 0.000          | 12                      |
| High Density Residential          | B     | 75  | 1.7          | 0.003          | 124                     |
| High Density Residential          | B/D   | 75  | 0.9          | 0.001          | 68                      |
| High Density Residential          | C     | 83  | 3.0          | 0.005          | 251                     |
| High Density Residential          | C/D   | 83  | 1.1          | 0.002          | 92                      |
| Medium Density Residential        | B     | 70  | 2.7          | 0.004          | 191                     |
| Medium Density Residential        | C     | 80  | 1.1          | 0.002          | 87                      |
| Low Density Residential           | B     | 68  | 0.2          | 0.000          | 14                      |
| Low Density Residential           | C/D   | 79  | 0.0          | 0.000          | 2                       |
| Very Low Density Residential      | B     | 69  | 4.2          | 0.007          | 289                     |
| Very Low Density Residential      | B/D   | 69  | 0.3          | 0.001          | 23                      |
| Very Low Density Residential      | C     | 79  | 4.5          | 0.007          | 352                     |
| Very Low Density Residential      | C/D   | 79  | 3.1          | 0.005          | 245                     |
| Very Low Density Residential      | D     | 84  | 0.7          | 0.001          | 57                      |
| Totals =                          |       |     | 36.66        | 0.057          | 3000.8                  |

Total (weighted) RCN = total product/total area = 81.86

RCN used = 82

**Subbasin: FSUT2-9A**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 6.0             | 0.009             | 537                        |
| Right-Of-Way                 | B/D   | 89  | 2.9             | 0.004             | 254                        |
| Right-Of-Way                 | C     | 92  | 2.3             | 0.004             | 209                        |
| Right-Of-Way                 | D     | 93  | 3.0             | 0.005             | 278                        |
| Medium Density Residential   | B     | 70  | 19.2            | 0.030             | 1347                       |
| Medium Density Residential   | B/D   | 70  | 9.6             | 0.015             | 672                        |
| Medium Density Residential   | C     | 80  | 8.9             | 0.014             | 709                        |
| Medium Density Residential   | D     | 85  | 9.8             | 0.015             | 831                        |
| Very Low Density Residential | B     | 69  | 1.0             | 0.002             | 69                         |
| Very Low Density Residential | C     | 79  | 0.0             | 0.000             | 2                          |
| <b>Totals =</b>              |       |     | 62.66           | 0.098             | 4908.3                     |

**Total (weighted) RCN = total product/total area = 78.33**

**RCN used = 78**

**Subbasin: FSUT2-9B**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 1.0             | 0.002             | 87                         |
| Right-Of-Way                 | B/D   | 89  | 1.7             | 0.003             | 154                        |
| Right-Of-Way                 | C     | 92  | 1.6             | 0.002             | 146                        |
| Right-Of-Way                 | C/D   | 92  | 0.1             | 0.000             | 5                          |
| Medium Density Residential   | A     | 54  | 0.2             | 0.000             | 11                         |
| Medium Density Residential   | B     | 70  | 1.2             | 0.002             | 86                         |
| Medium Density Residential   | B/D   | 70  | 3.1             | 0.005             | 219                        |
| Medium Density Residential   | C     | 80  | 0.6             | 0.001             | 52                         |
| Medium Density Residential   | D     | 85  | 1.5             | 0.002             | 130                        |
| Very Low Density Residential | A     | 49  | 0.1             | 0.000             | 6                          |
| Very Low Density Residential | B     | 69  | 3.2             | 0.005             | 224                        |
| Very Low Density Residential | B/D   | 69  | 14.5            | 0.023             | 998                        |
| Very Low Density Residential | C     | 79  | 12.3            | 0.019             | 968                        |
| Very Low Density Residential | C/D   | 79  | 0.4             | 0.001             | 29                         |
| Very Low Density Residential | D     | 84  | 16.6            | 0.026             | 1394                       |
| Open Space, Good Condition   | B     | 61  | 0.1             | 0.000             | 6                          |
| Open Space, Good Condition   | B/D   | 61  | 1.7             | 0.003             | 104                        |
| Open Space, Good Condition   | D     | 80  | 11.7            | 0.018             | 933                        |
| <b>Totals =</b>              |       |     | 71.63           | 0.112             | 5553.5                     |

**Total (weighted) RCN = total product/total area = 77.53**

**RCN used = 78**

**Subbasin: FSUT3-1A**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A     | 83  | 0.1             | 0.000             | 9                          |
| Right-Of-Way                      | C     | 92  | 2.8             | 0.004             | 258                        |
| Right-Of-Way                      | D     | 93  | 7.0             | 0.011             | 649                        |
| Commercial                        | A     | 89  | 1.7             | 0.003             | 152                        |
| Commercial                        | C     | 94  | 7.5             | 0.012             | 709                        |
| Commercial                        | D     | 95  | 0.2             | 0.000             | 17                         |
| Office/Institutional/Multi-Family | A     | 77  | 0.4             | 0.001             | 32                         |
| Office/Institutional/Multi-Family | C     | 90  | 0.4             | 0.001             | 39                         |
| Office/Institutional/Multi-Family | D     | 92  | 0.6             | 0.001             | 54                         |
| Low Density Residential           | A     | 51  | 0.3             | 0.000             | 15                         |
| Low Density Residential           | C     | 79  | 9.7             | 0.015             | 769                        |
| Low Density Residential           | D     | 84  | 36.1            | 0.056             | 3035                       |
| <b>Totals =</b>                   |       |     | 66.91           | 0.105             | 5737.8                     |

Total (weighted) RCN = total product/total area = 85.75

**RCN used = 86**

**Subbasin: FSUT3-1B**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B/D   | 89  | 6.6             | 0.010             | 583                        |
| Right-Of-Way                 | D     | 93  | 6.8             | 0.011             | 631                        |
| Office/Institutional/Medical | C     | 90  | 0.0             | 0.000             | 1                          |
| Office/Institutional/Medical | D     | 92  | 0.1             | 0.000             | 13                         |
| Low Density Residential      | B/D   | 68  | 26.0            | 0.041             | 1767                       |
| Low Density Residential      | D     | 84  | 21.4            | 0.033             | 1794                       |
| <b>Totals =</b>              |       |     | 60.83           | 0.095             | 4788.8                     |

Total (weighted) RCN = total product/total area = 78.73

**RCN used = 79**

**Subbasin: FSUT3-1C**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B/D   | 89  | 9.5             | 0.015             | 842                        |
| Right-Of-Way                 | C     | 92  | 0.0             | 0.000             | 0                          |
| Right-Of-Way                 | D     | 93  | 0.0             | 0.000             | 3                          |
| Office/Institutional/Medical | B/D   | 85  | 1.1             | 0.002             | 98                         |
| Office/Institutional/Medical | C     | 90  | 3.7             | 0.006             | 332                        |
| Office/Institutional/Medical | D     | 92  | 0.0             | 0.000             | 0                          |
| Low Density Residential      | B/D   | 68  | 42.6            | 0.067             | 2894                       |
| Low Density Residential      | C     | 79  | 1.0             | 0.002             | 81                         |
| Low Density Residential      | D     | 84  | 0.1             | 0.000             | 8                          |
| Very Low Density Residential | B/D   | 69  | 0.0             | 0.000             | 0                          |
| <b>Totals =</b>              |       |     | 58.01           | 0.091             | 4257.9                     |

Total (weighted) RCN = total product/total area = 73.39

**RCN used = 73**

**Subbasin: FSUT3-1D**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A     | 83  | 0.3     | 0.000     | 24           |
| Right-Of-Way                      | B/D   | 89  | 2.3     | 0.004     | 209          |
| Right-Of-Way                      | C     | 92  | 4.5     | 0.007     | 415          |
| Right-Of-Way                      | D     | 93  | 4.8     | 0.008     | 448          |
| Commercial                        | A     | 89  | 0.8     | 0.001     | 74           |
| Commercial                        | C     | 94  | 11.9    | 0.019     | 1118         |
| Commercial                        | D     | 95  | 0.1     | 0.000     | 11           |
| Office/Institutional/Multi-Family | B/D   | 85  | 0.4     | 0.001     | 36           |
| Office/Institutional/Multi-Family | C     | 90  | 13.5    | 0.021     | 1219         |
| Office/Institutional/Multi-Family | D     | 92  | 4.4     | 0.007     | 407          |
| High Density Residential          | B/D   | 75  | 0.0     | 0.000     | 0            |
| High Density Residential          | C     | 83  | 0.3     | 0.000     | 21           |
| High Density Residential          | D     | 87  | 3.8     | 0.006     | 328          |
| Medium Density Residential        | B/D   | 70  | 9.2     | 0.014     | 647          |
| Medium Density Residential        | D     | 85  | 5.9     | 0.009     | 498          |
| Low Density Residential           | C     | 79  | 0.2     | 0.000     | 14           |
| Low Density Residential           | D     | 84  | 17.9    | 0.028     | 1501         |
| Open Space, Good Condition        | B/D   | 61  | 16.4    | 0.026     | 1003         |
| Open Space, Good Condition        | C     | 74  | 8.6     | 0.013     | 636          |
| <b>Totals =</b>                   |       |     | 105.41  | 0.165     | 8609.6       |

**Total (weighted) RCN = total product/total area = 81.67**

**RCN used = 82**

**Subbasin: FSUT3-1E**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B/D   | 89  | 3.2     | 0.005     | 286          |
| Right-Of-Way                 | D     | 93  | 0.5     | 0.001     | 44           |
| Medium Density Residential   | B/D   | 70  | 9.8     | 0.015     | 688          |
| Medium Density Residential   | D     | 85  | 0.3     | 0.000     | 22           |
| Low Density Residential      | B/D   | 68  | 6.6     | 0.010     | 446          |
| Low Density Residential      | D     | 84  | 1.4     | 0.002     | 119          |
| Very Low Density Residential | B/D   | 69  | 0.0     | 0.000     | 0            |
| Open Space, Good Condition   | B/D   | 61  | 2.5     | 0.004     | 151          |
| <b>Totals =</b>              |       |     | 24.25   | 0.038     | 1757.6       |

**Total (weighted) RCN = total product/total area = 72.49**

**RCN used = 72**

**Subbasin: FSUT3-2A**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B/D   | 89  | 1.1     | 0.002     | 94           |
| Office/Institutional/Multi-Family | C     | 90  | 0.0     | 0.000     | 0            |
| Medium Density Residential        | B/D   | 70  | 7.4     | 0.012     | 519          |
| Open Space, Good Condition        | B/D   | 61  | 37.1    | 0.058     | 2263         |
| Open Space, Good Condition        | C     | 74  | 7.9     | 0.012     | 586          |
| <b>Totals =</b>                   |       |     | 53.49   | 0.084     | 3462.3       |

**Total (weighted) RCN = total product/total area = 64.73**

**RCN used = 65**

**Subbasin: FSUT3-2B**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B/D   | 89  | 4.3             | 0.007             | 380                        |
| Right-Of-Way                 | C     | 92  | 0.7             | 0.001             | 66                         |
| Medium Density Residential   | B/D   | 70  | 0.2             | 0.000             | 14                         |
| Medium Density Residential   | C     | 85  | 1.3             | 0.002             | 110                        |
| Low Density Residential      | B/D   | 68  | 7.5             | 0.012             | 507                        |
| Low Density Residential      | C     | 79  | 3.3             | 0.005             | 263                        |
| Very Low Density Residential | B/D   | 69  | 27.3            | 0.043             | 1881                       |
| Very Low Density Residential | C     | 79  | 4.3             | 0.007             | 336                        |
| Open Space, Good Condition   | B/D   | 61  | 13.7            | 0.021             | 837                        |
| Open Space, Good Condition   | C     | 74  | 8.7             | 0.014             | 646                        |
| <b>Totals =</b>              |       |     | 71.22           | 0.111             | 5039.1                     |

Total (weighted) RCN = total product/total area = 70.75

RCN used = 71

**Subbasin: FSUT3-3**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 0.3             | 0.000             | 26                         |
| Right-Of-Way                 | B/D   | 89  | 2.8             | 0.004             | 254                        |
| Right-Of-Way                 | C     | 92  | 5.0             | 0.008             | 457                        |
| High Density Residential     | B/D   | 75  | 3.9             | 0.006             | 289                        |
| High Density Residential     | C     | 83  | 6.7             | 0.011             | 558                        |
| Medium Density Residential   | B/D   | 70  | 2.9             | 0.004             | 200                        |
| Medium Density Residential   | C     | 80  | 3.2             | 0.005             | 259                        |
| Low Density Residential      | B/D   | 68  | 1.9             | 0.003             | 129                        |
| Low Density Residential      | C     | 79  | 1.6             | 0.003             | 130                        |
| Very Low Density Residential | B     | 69  | 1.5             | 0.002             | 106                        |
| Very Low Density Residential | B/D   | 69  | 11.8            | 0.018             | 815                        |
| Very Low Density Residential | C     | 79  | 15.5            | 0.024             | 1225                       |
| Open Space, Good Condition   | C     | 74  | 1.0             | 0.002             | 76                         |
| <b>Totals =</b>              |       |     | 58.22           | 0.091             | 4524.7                     |

Total (weighted) RCN = total product/total area = 77.72

RCN used = 78

**Subbasin: FSUT3-4A**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B/D   | 89  | 1.9             | 0.003             | 171                        |
| Commercial                        | B/D   | 92  | 1.3             | 0.002             | 118                        |
| Office/Institutional/Multi-Family | B/D   | 85  | 16.6            | 0.026             | 1407                       |
| Office/Institutional/Multi-Family | C     | 90  | 3.5             | 0.005             | 314                        |
| High Density Residential          | B/D   | 75  | 8.5             | 0.013             | 639                        |
| High Density Residential          | C     | 83  | 1.8             | 0.003             | 147                        |
| Open Space, Good Condition        | B/D   | 61  | 3.3             | 0.005             | 199                        |
| Open Space, Good Condition        | C     | 74  | 6.0             | 0.009             | 446                        |
| <b>Totals =</b>                   |       |     | 42.85           | 0.067             | 3442.7                     |

Total (weighted) RCN = total product/total area = 80.35

RCN used = 80

**Subbasin: FSUT3-4B**

| Landuse                           | Soil  |     | Area         | Area         | Product of    |
|-----------------------------------|-------|-----|--------------|--------------|---------------|
|                                   | Group | RCN | (Acres)      | (Sq. Mi.)    | RCN and Area  |
| Right-Of-Way                      | B/D   | 89  | 1.1          | 0.002        | 98            |
| Right-Of-Way                      | C     | 92  | 0.1          | 0.000        | 6             |
| Right-Of-Way                      | D     | 93  | 0.2          | 0.000        | 14            |
| Commercial                        | B/D   | 92  | 1.3          | 0.002        | 123           |
| Commercial                        | C     | 94  | 16.3         | 0.026        | 1536          |
| Commercial                        | D     | 95  | 0.1          | 0.000        | 7             |
| Office/Institutional/Medical      | B/D   | 85  | 0.0          | 0.000        | 1             |
| Office/Institutional/Medical      | C     | 90  | 0.3          | 0.000        | 24            |
| Office/Institutional/Multi-Family | B/D   | 85  | 8.1          | 0.013        | 687           |
| Office/Institutional/Multi-Family | C     | 90  | 5.0          | 0.008        | 451           |
| Office/Institutional/Multi-Family | D     | 92  | 0.3          | 0.001        | 31            |
| High Density Residential          | B/D   | 75  | 5.8          | 0.009        | 435           |
| High Density Residential          | C     | 83  | 2.4          | 0.004        | 198           |
| Very Low Density Residential      | B/D   | 69  | 0.8          | 0.001        | 55            |
| Very Low Density Residential      | C     | 79  | 0.3          | 0.000        | 20            |
| Open Space, Good Condition        | B/D   | 61  | 1.3          | 0.002        | 77            |
| Open Space, Good Condition        | C     | 74  | 0.0          | 0.000        | 1             |
| <b>Totals =</b>                   |       |     | <b>43.28</b> | <b>0.068</b> | <b>3763.1</b> |

Total (weighted) RCN = total product/total area = 86.95

RCN used = 87

**Subbasin: FSUT3-4C**

| Landuse                           | Soil  |     | Area         | Area         | Product of    |
|-----------------------------------|-------|-----|--------------|--------------|---------------|
|                                   | Group | RCN | (Acres)      | (Sq. Mi.)    | RCN and Area  |
| Right-Of-Way                      | B     | 89  | 0.3          | 0.000        | 23            |
| Right-Of-Way                      | B/D   | 89  | 10.7         | 0.017        | 953           |
| Right-Of-Way                      | C     | 92  | 1.5          | 0.002        | 135           |
| Commercial                        | B/D   | 92  | 6.5          | 0.010        | 600           |
| Commercial                        | C     | 94  | 3.0          | 0.005        | 278           |
| Office/Institutional/Medical      | B/D   | 85  | 1.2          | 0.002        | 99            |
| Office/Institutional/Medical      | C     | 90  | 0.0          | 0.000        | 0             |
| Office/Institutional/Multi-Family | B/D   | 85  | 16.6         | 0.026        | 1415          |
| Office/Institutional/Multi-Family | C     | 90  | 4.4          | 0.007        | 395           |
| High Density Residential          | B     | 75  | 0.7          | 0.001        | 51            |
| High Density Residential          | B/D   | 75  | 0.3          | 0.000        | 20            |
| High Density Residential          | C     | 83  | 0.3          | 0.000        | 22            |
| Medium Density Residential        | C     | 80  | 0.0          | 0.000        | 1             |
| Open Space, Good Condition        | B     | 61  | 0.5          | 0.001        | 33            |
| Open Space, Good Condition        | B/D   | 61  | 27.6         | 0.043        | 1684          |
| Open Space, Good Condition        | C     | 74  | 10.7         | 0.017        | 794           |
| <b>Totals =</b>                   |       |     | <b>84.21</b> | <b>0.132</b> | <b>6502.3</b> |

Total (weighted) RCN = total product/total area = 77.22

RCN used = 77

**Subbasin: FSUT3-4D**

| Landuse                           | Soil  |     | Area         | Area         | Product of    |
|-----------------------------------|-------|-----|--------------|--------------|---------------|
|                                   | Group | RCN | (Acres)      | (Sq. Mi.)    | RCN and Area  |
| Right-Of-Way                      | B     | 89  | 0.4          | 0.001        | 37            |
| Right-Of-Way                      | B/D   | 89  | 1.0          | 0.002        | 88            |
| Right-Of-Way                      | C     | 92  | 0.4          | 0.001        | 34            |
| Commercial                        | B/D   | 92  | 10.3         | 0.016        | 943           |
| Commercial                        | C     | 94  | 2.2          | 0.003        | 204           |
| Commercial                        | D     | 95  | 2.4          | 0.004        | 231           |
| Office/Institutional/Multi-Family | B/D   | 85  | 11.9         | 0.019        | 1009          |
| High Density Residential          | B     | 75  | 5.5          | 0.009        | 412           |
| High Density Residential          | B/D   | 75  | 5.0          | 0.008        | 374           |
| High Density Residential          | C     | 83  | 11.6         | 0.018        | 960           |
| High Density Residential          | D     | 87  | 3.4          | 0.005        | 297           |
| <b>Totals =</b>                   |       |     | <b>53.96</b> | <b>0.084</b> | <b>4589.4</b> |

Total (weighted) RCN = total product/total area = 85.05

RCN used = 85

**Subbasin: FSUT3-5**

| Landuse                           | Soil  | RCN    | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|--------|-----------------|-------------------|----------------------------|
|                                   | Group |        |                 |                   |                            |
| Right-Of-Way                      | B     | 89     | 2.6             | 0.004             | 233                        |
| Right-Of-Way                      | B/D   | 89     | 5.5             | 0.009             | 493                        |
| Right-Of-Way                      | C     | 92     | 3.8             | 0.006             | 350                        |
| Industrial                        | A     | 81     | 0.3             | 0.000             | 23                         |
| Industrial                        | A/D   | 81     | 0.6             | 0.001             | 51                         |
| Industrial                        | B     | 88     | 0.3             | 0.000             | 28                         |
| Industrial                        | B/D   | 88     | 0.9             | 0.001             | 80                         |
| Industrial                        | C     | 91     | 0.0             | 0.000             | 0                          |
| Commercial                        | B     | 92     | 2.7             | 0.004             | 252                        |
| Commercial                        | B/D   | 92     | 34.1            | 0.053             | 3135                       |
| Commercial                        | C     | 94     | 8.9             | 0.014             | 838                        |
| Commercial                        | D     | 95     | 1.2             | 0.002             | 110                        |
| Office/Institutional/Medical      | B/D   | 85     | 0.1             | 0.000             | 8                          |
| Office/Institutional/Medical      | C     | 90     | 3.0             | 0.005             | 269                        |
| Office/Institutional/Multi-Family | A     | 77     | 1.7             | 0.003             | 131                        |
| Office/Institutional/Multi-Family | B     | 85     | 0.1             | 0.000             | 8                          |
| Office/Institutional/Multi-Family | B/D   | 85     | 2.9             | 0.004             | 242                        |
| Office/Institutional/Multi-Family | C     | 90     | 7.8             | 0.012             | 701                        |
| Office/Institutional/Multi-Family | D     | 92     | 0.2             | 0.000             | 18                         |
| High Density Residential          | B/D   | 75     | 0.5             | 0.001             | 37                         |
| High Density Residential          | C     | 83     | 0.1             | 0.000             | 10                         |
| Very Low Density Residential      | A/D   | 49     | 0.0             | 0.000             | 1                          |
| Very Low Density Residential      | B     | 69     | 1.3             | 0.002             | 91                         |
| Very Low Density Residential      | B/D   | 69     | 12.7            | 0.020             | 873                        |
| Very Low Density Residential      | C     | 79     | 7.5             | 0.012             | 595                        |
| Open Space, Good Condition        | B     | 61     | 0.1             | 0.000             | 7                          |
| Open Space, Good Condition        | B/D   | 61     | 1.1             | 0.002             | 68                         |
| Open Space, Good Condition        | C     | 74     | 0.6             | 0.001             | 46                         |
| Open Space, Good Condition        | D     | 80     | 0.1             | 0.000             | 7                          |
| <b>Totals =</b>                   |       | 100.80 | 0.158           | 8706.9            |                            |

**Total (weighted) RCN = total product/total area = 86.38**

**RCN used = 86**

**Subbasin: FSUT3-6**

| Landuse                           | Soil  | RCN   | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-------|-----------------|-------------------|----------------------------|
|                                   | Group |       |                 |                   |                            |
| Right-Of-Way                      | B     | 89    | 0.4             | 0.001             | 31                         |
| Right-Of-Way                      | B/D   | 89    | 5.9             | 0.009             | 521                        |
| Right-Of-Way                      | C     | 92    | 2.6             | 0.004             | 235                        |
| Right-Of-Way                      | D     | 93    | 0.0             | 0.000             | 0                          |
| Commercial                        | B/D   | 92    | 8.9             | 0.014             | 814                        |
| Commercial                        | C     | 94    | 1.8             | 0.003             | 168                        |
| Commercial                        | D     | 95    | 0.2             | 0.000             | 15                         |
| Office/Institutional/Medical      | C     | 90    | 0.0             | 0.000             | 0                          |
| Office/Institutional/Medical      | D     | 92    | 0.5             | 0.001             | 44                         |
| Office/Institutional/Multi-Family | B     | 85    | 0.7             | 0.001             | 62                         |
| Office/Institutional/Multi-Family | B/D   | 85    | 4.5             | 0.007             | 383                        |
| Office/Institutional/Multi-Family | C     | 90    | 1.9             | 0.003             | 174                        |
| Office/Institutional/Multi-Family | D     | 92    | 0.1             | 0.000             | 9                          |
| Very Low Density Residential      | B     | 69    | 2.1             | 0.003             | 144                        |
| Very Low Density Residential      | B/D   | 69    | 0.8             | 0.001             | 55                         |
| Very Low Density Residential      | C     | 79    | 0.5             | 0.001             | 41                         |
| Very Low Density Residential      | D     | 84    | 1.1             | 0.002             | 89                         |
| Open Space, Good Condition        | B     | 61    | 0.3             | 0.000             | 19                         |
| Open Space, Good Condition        | B/D   | 61    | 28.0            | 0.044             | 1708                       |
| Open Space, Good Condition        | C     | 74    | 6.9             | 0.011             | 514                        |
| Open Space, Good Condition        | D     | 80    | 2.9             | 0.004             | 228                        |
| <b>Totals =</b>                   |       | 69.87 | 0.109           | 5254.4            |                            |

**Total (weighted) RCN = total product/total area = 75.21**

**RCN used = 75**



**Subbasin: FSUT3-7**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 0.7     | 0.001     | 64           |
| Right-Of-Way                      | B/D   | 89  | 2.8     | 0.004     | 249          |
| Right-Of-Way                      | C     | 92  | 6.7     | 0.010     | 615          |
| Right-Of-Way                      | D     | 93  | 1.6     | 0.003     | 152          |
| Industrial                        | C     | 91  | 0.1     | 0.000     | 6            |
| Commercial                        | B/D   | 92  | 1.2     | 0.002     | 108          |
| Commercial                        | C     | 94  | 0.6     | 0.001     | 52           |
| Commercial                        | D     | 95  | 0.5     | 0.001     | 50           |
| Mixed Use/Office/Institutional    | B/D   | 85  | 1.3     | 0.002     | 111          |
| Mixed Use/Office/Institutional    | C     | 90  | 0.0     | 0.000     | 0            |
| Mixed Use/Office/Institutional    | D     | 92  | 1.2     | 0.002     | 112          |
| Office/Institutional/Medical      | B/D   | 85  | 1.0     | 0.002     | 84           |
| Office/Institutional/Medical      | C     | 90  | 1.2     | 0.002     | 104          |
| Office/Institutional/Medical      | D     | 92  | 0.5     | 0.001     | 49           |
| Office/Institutional/Multi-Family | B     | 85  | 0.0     | 0.000     | 2            |
| Office/Institutional/Multi-Family | B/D   | 85  | 4.8     | 0.008     | 409          |
| Office/Institutional/Multi-Family | C     | 90  | 15.8    | 0.025     | 1424         |
| Office/Institutional/Multi-Family | D     | 92  | 4.7     | 0.007     | 435          |
| High Density Residential          | B     | 75  | 2.7     | 0.004     | 206          |
| High Density Residential          | B/D   | 75  | 15.0    | 0.023     | 1124         |
| High Density Residential          | C     | 83  | 5.3     | 0.008     | 443          |
| High Density Residential          | D     | 87  | 1.4     | 0.002     | 119          |
| High Density Residential          | W     | 100 | 0.3     | 0.000     | 26           |
| Very Low Density Residential      | B     | 69  | 1.3     | 0.002     | 89           |
| Very Low Density Residential      | C     | 79  | 1.3     | 0.002     | 101          |
| Open Space, Good Condition        | B     | 61  | 0.5     | 0.001     | 28           |
| Open Space, Good Condition        | B/D   | 61  | 12.1    | 0.019     | 739          |
| Open Space, Good Condition        | C     | 74  | 5.5     | 0.009     | 409          |
| Open Space, Good Condition        | D     | 80  | 0.7     | 0.001     | 58           |
| <b>Totals =</b>                   |       |     | 90.82   | 0.142     | 7367.2       |

Total (weighted) RCN = total product/total area = 81.12

RCN used = 81

**Subbasin: FSUT3-8**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A/D   | 83  | 1.1     | 0.002     | 89           |
| Right-Of-Way                      | B     | 89  | 2.4     | 0.004     | 211          |
| Right-Of-Way                      | B/D   | 89  | 2.1     | 0.003     | 188          |
| Right-Of-Way                      | C     | 92  | 0.2     | 0.000     | 16           |
| Right-Of-Way                      | W     | 100 | 0.1     | 0.000     | 13           |
| Commercial                        | B/D   | 92  | 0.5     | 0.001     | 49           |
| Commercial                        | C     | 94  | 0.4     | 0.001     | 38           |
| Office/Institutional/Medical      | B/D   | 85  | 0.6     | 0.001     | 52           |
| Office/Institutional/Multi-Family | B/D   | 85  | 2.6     | 0.004     | 223          |
| Office/Institutional/Multi-Family | C     | 90  | 6.0     | 0.009     | 541          |
| High Density Residential          | A/D   | 61  | 4.2     | 0.007     | 257          |
| High Density Residential          | B     | 75  | 4.4     | 0.007     | 332          |
| High Density Residential          | B/D   | 75  | 10.1    | 0.016     | 757          |
| High Density Residential          | C     | 83  | 0.2     | 0.000     | 13           |
| High Density Residential          | W     | 100 | 0.1     | 0.000     | 12           |
| Medium Density Residential        | B     | 70  | 0.1     | 0.000     | 6            |
| Medium Density Residential        | B/D   | 70  | 0.2     | 0.000     | 11           |
| Very Low Density Residential      | A/D   | 49  | 0.6     | 0.001     | 28           |
| Very Low Density Residential      | B     | 69  | 8.6     | 0.013     | 592          |
| Very Low Density Residential      | B/D   | 69  | 0.0     | 0.000     | 3            |
| Very Low Density Residential      | C     | 79  | 3.1     | 0.005     | 242          |
| Open Space, Good Condition        | B/D   | 69  | 2.4     | 0.004     | 164          |
| Open Space, Good Condition        | C     | 79  | 0.0     | 0.000     | 1            |
| <b>Totals =</b>                   |       |     | 49.94   | 0.078     | 3838.0       |

Total (weighted) RCN = total product/total area = 76.85

RCN used = 77

**Subbasin: FSUT3-9A**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A     | 83  | 0.4             | 0.001             | 33                         |
| Right-Of-Way                      | A/D   | 83  | 0.3             | 0.000             | 26                         |
| Right-Of-Way                      | B     | 89  | 0.5             | 0.001             | 46                         |
| Right-Of-Way                      | C     | 92  | 2.4             | 0.004             | 216                        |
| Right-Of-Way                      | D     | 93  | 0.4             | 0.001             | 38                         |
| Industrial                        | A     | 81  | 0.4             | 0.001             | 29                         |
| Industrial                        | A/D   | 81  | 1.1             | 0.002             | 92                         |
| Industrial                        | B     | 88  | 0.1             | 0.000             | 11                         |
| Industrial                        | B/D   | 88  | 0.4             | 0.001             | 37                         |
| Industrial                        | C     | 91  | 2.1             | 0.003             | 192                        |
| Commercial                        | C     | 94  | 0.3             | 0.000             | 28                         |
| Office/Institutional/Multi-Family | A/D   | 77  | 0.7             | 0.001             | 52                         |
| Office/Institutional/Multi-Family | B/D   | 85  | 0.2             | 0.000             | 15                         |
| Office/Institutional/Multi-Family | C     | 90  | 9.4             | 0.015             | 849                        |
| Office/Institutional/Multi-Family | D     | 92  | 1.6             | 0.002             | 144                        |
| High Density Residential          | A     | 61  | 0.1             | 0.000             | 9                          |
| High Density Residential          | A/D   | 61  | 2.2             | 0.003             | 133                        |
| High Density Residential          | B     | 75  | 0.9             | 0.001             | 67                         |
| High Density Residential          | B/D   | 75  | 1.6             | 0.002             | 119                        |
| High Density Residential          | C     | 83  | 6.9             | 0.011             | 573                        |
| High Density Residential          | D     | 87  | 0.2             | 0.000             | 14                         |
| Very Low Density Residential      | B     | 69  | 0.1             | 0.000             | 4                          |
| Very Low Density Residential      | B/D   | 69  | 0.0             | 0.000             | 2                          |
| Very Low Density Residential      | C     | 79  | 1.3             | 0.002             | 99                         |
| <b>Totals =</b>                   |       |     | 33.48           | 0.052             | 2826.8                     |

**Total (weighted) RCN = total product/total area = 84.44**

**RCN used = 84**

**Subbasin: FSUT3-9B**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A     | 83  | 0.4             | 0.001             | 31                         |
| Right-Of-Way                      | A/D   | 83  | 0.7             | 0.001             | 59                         |
| Right-Of-Way                      | B     | 89  | 2.1             | 0.003             | 191                        |
| Right-Of-Way                      | B/D   | 89  | 2.2             | 0.003             | 196                        |
| Right-Of-Way                      | C     | 92  | 6.1             | 0.009             | 557                        |
| Right-Of-Way                      | D     | 93  | 0.5             | 0.001             | 51                         |
| Industrial                        | A     | 81  | 1.2             | 0.002             | 94                         |
| Industrial                        | A/D   | 81  | 1.5             | 0.002             | 121                        |
| Industrial                        | B     | 88  | 0.6             | 0.001             | 56                         |
| Industrial                        | B/D   | 88  | 1.1             | 0.002             | 100                        |
| Industrial                        | C     | 91  | 7.7             | 0.012             | 705                        |
| Industrial                        | D     | 92  | 0.7             | 0.001             | 69                         |
| Commercial                        | C     | 94  | 0.3             | 0.000             | 25                         |
| Office/Institutional/Multi-Family | A/D   | 77  | 1.2             | 0.002             | 94                         |
| Office/Institutional/Multi-Family | B     | 85  | 0.3             | 0.000             | 27                         |
| Office/Institutional/Multi-Family | B/D   | 85  | 3.1             | 0.005             | 262                        |
| Office/Institutional/Multi-Family | C     | 90  | 1.1             | 0.002             | 98                         |
| Office/Institutional/Multi-Family | D     | 92  | 1.2             | 0.002             | 106                        |
| High Density Residential          | B/D   | 75  | 1.7             | 0.003             | 124                        |
| High Density Residential          | C     | 83  | 2.9             | 0.005             | 244                        |
| Medium Density Residential        | A     | 54  | 0.1             | 0.000             | 7                          |
| Medium Density Residential        | A/D   | 54  | 0.4             | 0.001             | 22                         |
| Medium Density Residential        | B/D   | 70  | 10.9            | 0.017             | 766                        |
| Medium Density Residential        | C     | 80  | 21.0            | 0.033             | 1681                       |
| Medium Density Residential        | D     | 85  | 1.0             | 0.002             | 83                         |
| Very Low Density Residential      | A     | 49  | 0.0             | 0.000             | 0                          |
| Very Low Density Residential      | B     | 69  | 2.4             | 0.004             | 166                        |
| Very Low Density Residential      | B/D   | 69  | 4.4             | 0.007             | 307                        |
| Very Low Density Residential      | C     | 79  | 1.3             | 0.002             | 102                        |
| Very Low Density Residential      | D     | 84  | 0.3             | 0.000             | 26                         |
| Open Space, Good Condition        | B     | 61  | 1.1             | 0.002             | 67                         |
| Open Space, Good Condition        | B/D   | 61  | 22.2            | 0.035             | 1351                       |
| Open Space, Good Condition        | C     | 74  | 2.3             | 0.004             | 171                        |
| Open Space, Good Condition        | D     | 80  | 1.0             | 0.002             | 83                         |
| <b>Totals =</b>                   |       |     | 105.20          | 0.164             | 8042.4                     |

**Total (weighted) RCN = total product/total area = 76.45**

**RCN used = 76**

**Subbasin: FSUT3-9C**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A/D   | 83  | 0.7             | 0.001             | 61                         |
| Right-Of-Way                      | B     | 89  | 3.9             | 0.006             | 349                        |
| Right-Of-Way                      | B/D   | 89  | 3.1             | 0.005             | 274                        |
| Right-Of-Way                      | C     | 92  | 6.3             | 0.010             | 581                        |
| Right-Of-Way                      | D     | 93  | 2.4             | 0.004             | 220                        |
| Right-Of-Way                      | W     | 100 | 0.0             | 0.000             | 1                          |
| Industrial                        | C     | 91  | 0.4             | 0.001             | 34                         |
| Commercial                        | A/D   | 89  | 0.9             | 0.001             | 78                         |
| Commercial                        | B     | 92  | 2.0             | 0.003             | 188                        |
| Commercial                        | B/D   | 92  | 3.3             | 0.005             | 308                        |
| Commercial                        | C     | 94  | 0.1             | 0.000             | 14                         |
| Mixed Use/Office/Institutional    | A/D   | 77  | 0.7             | 0.001             | 56                         |
| Mixed Use/Office/Institutional    | B     | 85  | 1.5             | 0.002             | 123                        |
| Mixed Use/Office/Institutional    | B/D   | 85  | 1.4             | 0.002             | 120                        |
| Mixed Use/Office/Institutional    | C     | 90  | 0.2             | 0.000             | 20                         |
| Office/Institutional/Medical      | A/D   | 77  | 0.6             | 0.001             | 44                         |
| Office/Institutional/Medical      | B/D   | 85  | 1.8             | 0.003             | 153                        |
| Office/Institutional/Multi-Family | B     | 85  | 1.8             | 0.003             | 150                        |
| Office/Institutional/Multi-Family | C     | 90  | 1.5             | 0.002             | 132                        |
| High Density Residential          | A/D   | 61  | 0.9             | 0.001             | 56                         |
| High Density Residential          | B     | 75  | 5.3             | 0.008             | 401                        |
| High Density Residential          | B/D   | 75  | 2.5             | 0.004             | 191                        |
| High Density Residential          | C     | 83  | 6.2             | 0.010             | 512                        |
| High Density Residential          | D     | 87  | 0.0             | 0.000             | 0                          |
| High Density Residential          | W     | 100 | 0.0             | 0.000             | 0                          |
| Medium Density Residential        | B     | 70  | 4.6             | 0.007             | 321                        |
| Medium Density Residential        | B/D   | 70  | 0.1             | 0.000             | 8                          |
| Medium Density Residential        | C     | 80  | 2.7             | 0.004             | 218                        |
| Medium Density Residential        | D     | 85  | 5.6             | 0.009             | 479                        |
| Low Density Residential           | B     | 68  | 0.1             | 0.000             | 5                          |
| Low Density Residential           | C     | 79  | 11.5            | 0.018             | 907                        |
| Low Density Residential           | D     | 84  | 1.9             | 0.003             | 163                        |
| Very Low Density Residential      | B     | 69  | 1.2             | 0.002             | 80                         |
| Very Low Density Residential      | B/D   | 69  | 19.3            | 0.030             | 1329                       |
| Very Low Density Residential      | C     | 79  | 3.2             | 0.005             | 253                        |
| Very Low Density Residential      | D     | 84  | 2.1             | 0.003             | 181                        |
| Open Space, Good Condition        | B/D   | 61  | 1.9             | 0.003             | 117                        |
| Open Space, Good Condition        | C     | 74  | 0.1             | 0.000             | 4                          |
| <b>Totals =</b>                   |       |     | 101.90          | 0.159             | 8130.4                     |

**Total (weighted) RCN = total product/total area = 79.79**

**RCN used = 80**

**Subbasin: FSUT3-9D**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B     | 89  | 2.3             | 0.004             | 206                        |
| Right-Of-Way                      | B/D   | 89  | 0.6             | 0.001             | 55                         |
| Right-Of-Way                      | C     | 92  | 1.5             | 0.002             | 141                        |
| Right-Of-Way                      | D     | 93  | 0.3             | 0.001             | 30                         |
| Commercial                        | B     | 92  | 1.5             | 0.002             | 142                        |
| Commercial                        | B/D   | 92  | 2.1             | 0.003             | 196                        |
| Commercial                        | C     | 94  | 4.2             | 0.007             | 392                        |
| Commercial                        | D     | 95  | 2.2             | 0.003             | 205                        |
| Office/Institutional/Multi-Family | B     | 85  | 6.6             | 0.010             | 559                        |
| Office/Institutional/Multi-Family | B/D   | 85  | 1.7             | 0.003             | 146                        |
| Office/Institutional/Multi-Family | C     | 90  | 10.5            | 0.016             | 941                        |
| Office/Institutional/Multi-Family | D     | 92  | 0.3             | 0.000             | 24                         |
| High Density Residential          | B     | 75  | 3.2             | 0.005             | 239                        |
| High Density Residential          | B/D   | 75  | 0.5             | 0.001             | 40                         |
| High Density Residential          | C     | 83  | 0.8             | 0.001             | 69                         |
| High Density Residential          | D     | 87  | 1.2             | 0.002             | 100                        |
| Medium Density Residential        | B     | 70  | 0.4             | 0.001             | 28                         |
| Medium Density Residential        | C     | 80  | 1.1             | 0.002             | 89                         |
| Medium Density Residential        | D     | 85  | 0.3             | 0.000             | 26                         |
| Low Density Residential           | B     | 68  | 2.2             | 0.003             | 147                        |
| Low Density Residential           | C     | 79  | 4.4             | 0.007             | 347                        |
| Low Density Residential           | D     | 84  | 0.3             | 0.000             | 23                         |
| Open Space, Good Condition        | B     | 61  | 7.0             | 0.011             | 429                        |
| Open Space, Good Condition        | B/D   | 61  | 0.2             | 0.000             | 14                         |
| Open Space, Good Condition        | C     | 74  | 0.4             | 0.001             | 26                         |
| Open Space, Good Condition        | D     | 80  | 0.4             | 0.001             | 32                         |
| <b>Totals =</b>                   |       |     | 56.14           | 0.088             | 4644.6                     |

**Total (weighted) RCN = total product/total area = 82.73**

**RCN used = 83**

**Subbasin: FSUT3-10A**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B     | 89  | 6.3             | 0.010             | 557                        |
| Right-Of-Way                      | B/D   | 89  | 1.2             | 0.002             | 105                        |
| Right-Of-Way                      | C     | 92  | 10.0            | 0.016             | 920                        |
| Right-Of-Way                      | D     | 93  | 1.8             | 0.003             | 169                        |
| Office/Institutional/Multi-Family | B/D   | 85  | 0.0             | 0.000             | 0                          |
| Office/Institutional/Multi-Family | C     | 90  | 0.0             | 0.000             | 1                          |
| Medium Density Residential        | B     | 70  | 9.0             | 0.014             | 632                        |
| Medium Density Residential        | B/D   | 70  | 5.0             | 0.008             | 349                        |
| Medium Density Residential        | C     | 80  | 20.0            | 0.031             | 1600                       |
| Medium Density Residential        | D     | 85  | 0.2             | 0.000             | 16                         |
| Low Density Residential           | B     | 68  | 22.8            | 0.036             | 1547                       |
| Low Density Residential           | B/D   | 68  | 0.1             | 0.000             | 9                          |
| Low Density Residential           | C     | 79  | 27.2            | 0.043             | 2150                       |
| Low Density Residential           | D     | 84  | 7.1             | 0.011             | 593                        |
| Very Low Density Residential      | B     | 69  | 0.0             | 0.000             | 2                          |
| Very Low Density Residential      | C     | 79  | 0.0             | 0.000             | 1                          |
| Open Space, Good Condition        | B     | 61  | 1.2             | 0.002             | 74                         |
| Open Space, Good Condition        | B/D   | 61  | 12.0            | 0.019             | 732                        |
| Open Space, Good Condition        | C     | 74  | 24.1            | 0.038             | 1786                       |
| Open Space, Good Condition        | D     | 80  | 8.7             | 0.014             | 694                        |
| <b>Totals =</b>                   |       |     | 156.70          | 0.245             | 11938.1                    |

**Total (weighted) RCN = total product/total area = 76.18**

**RCN used = 76**

**Subbasin: FSUT3-10B**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B/D   | 89  | 0.8             | 0.001             | 67                         |
| Right-Of-Way                      | C     | 92  | 0.1             | 0.000             | 11                         |
| Right-Of-Way                      | D     | 93  | 0.2             | 0.000             | 17                         |
| Commercial                        | B/D   | 92  | 2.8             | 0.004             | 259                        |
| Commercial                        | C     | 94  | 0.6             | 0.001             | 55                         |
| Commercial                        | D     | 95  | 0.1             | 0.000             | 10                         |
| Office/Institutional/Multi-Family | B/D   | 85  | 14.5            | 0.023             | 1229                       |
| Office/Institutional/Multi-Family | C     | 90  | 19.1            | 0.030             | 1721                       |
| Office/Institutional/Multi-Family | D     | 92  | 1.3             | 0.002             | 124                        |
| High Density Residential          | B     | 75  | 0.5             | 0.001             | 35                         |
| High Density Residential          | B/D   | 75  | 5.7             | 0.009             | 426                        |
| High Density Residential          | C     | 83  | 4.0             | 0.006             | 329                        |
| High Density Residential          | D     | 87  | 1.2             | 0.002             | 101                        |
| Medium Density Residential        | B/D   | 70  | 1.0             | 0.002             | 67                         |
| Medium Density Residential        | D     | 85  | 0.2             | 0.000             | 19                         |
| Very Low Density Residential      | B/D   | 69  | 3.9             | 0.006             | 269                        |
| Very Low Density Residential      | D     | 84  | 0.1             | 0.000             | 8                          |
| <b>Totals =</b>                   |       |     | 55.98           | 0.087             | 4750.4                     |

Total (weighted) RCN = total product/total area = 84.86

RCN used = 85

**Subbasin: FSUT3-10C**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A     | 83  | 3.1             | 0.005             | 258                        |
| Right-Of-Way                      | B     | 89  | 6.0             | 0.009             | 536                        |
| Right-Of-Way                      | B/D   | 89  | 1.5             | 0.002             | 136                        |
| Right-Of-Way                      | C     | 92  | 3.6             | 0.006             | 332                        |
| Right-Of-Way                      | D     | 93  | 0.9             | 0.001             | 82                         |
| Office/Institutional/Multi-Family | D     | 92  | 0.1             | 0.000             | 5                          |
| High Density Residential          | C     | 83  | 0.0             | 0.000             | 0                          |
| Medium Density Residential        | A     | 54  | 7.5             | 0.012             | 403                        |
| Medium Density Residential        | B     | 70  | 24.7            | 0.039             | 1730                       |
| Medium Density Residential        | B/D   | 70  | 10.8            | 0.017             | 757                        |
| Medium Density Residential        | C     | 80  | 17.3            | 0.027             | 1383                       |
| Medium Density Residential        | D     | 85  | 5.6             | 0.009             | 479                        |
| Low Density Residential           | B     | 68  | 0.1             | 0.000             | 10                         |
| Low Density Residential           | C     | 79  | 0.5             | 0.001             | 38                         |
| Very Low Density Residential      | B     | 69  | 0.3             | 0.000             | 18                         |
| Very Low Density Residential      | C     | 79  | 0.2             | 0.000             | 19                         |
| Open Space, Good Condition        | A     | 39  | 2.3             | 0.004             | 89                         |
| Open Space, Good Condition        | B     | 61  | 0.5             | 0.001             | 29                         |
| Open Space, Good Condition        | B/D   | 61  | 36.5            | 0.057             | 2224                       |
| Open Space, Good Condition        | C     | 74  | 5.6             | 0.009             | 413                        |
| Open Space, Good Condition        | D     | 80  | 12.1            | 0.019             | 970                        |
| <b>Totals =</b>                   |       |     | 139.17          | 0.217             | 9911.0                     |

Total (weighted) RCN = total product/total area = 71.22

RCN used = 71

### SCS Runoff Curve Number - Primary System

Project: City of Greenville - Fork Swamp Watershed  
 Conditions: Future  
 Prepared by: SMB  
 Checked by: TLM  
 Date: December 15, 2015

#### Subbasin: FS-1A

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 1.1             | 0.002             | 95                         |
| Right-Of-Way                 | B/D   | 89  | 3.2             | 0.005             | 288                        |
| Right-Of-Way                 | C     | 92  | 8.4             | 0.013             | 772                        |
| Right-Of-Way                 | D     | 93  | 2.3             | 0.004             | 214                        |
| Commercial                   | B     | 92  | 0.5             | 0.001             | 44                         |
| Commercial                   | B/D   | 92  | 14.1            | 0.022             | 1297                       |
| Commercial                   | C     | 94  | 17.1            | 0.027             | 1607                       |
| Commercial                   | D     | 95  | 8.9             | 0.014             | 850                        |
| Office/Institutional/Medical | C     | 90  | 1.3             | 0.002             | 115                        |
| Office/Institutional/Medical | D     | 92  | 0.7             | 0.001             | 60                         |
| Medium Density Residential   | B/D   | 70  | 8.5             | 0.013             | 596                        |
| Medium Density Residential   | C     | 80  | 3.6             | 0.006             | 287                        |
| Medium Density Residential   | D     | 85  | 6.5             | 0.010             | 555                        |
| <b>Totals =</b>              |       |     | 76.2            | 0.119             | 6780.4                     |

Total (weighted) RCN = total product/total area = 89.00

RCN used = 89

#### Subbasin: FS-1B

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B/D   | 89  | 2.5             | 0.004             | 219                        |
| Right-Of-Way               | C     | 92  | 3.6             | 0.006             | 331                        |
| Right-Of-Way               | D     | 93  | 8.0             | 0.013             | 747                        |
| Commercial                 | B     | 92  | 0.6             | 0.001             | 59                         |
| Commercial                 | B/D   | 92  | 1.6             | 0.002             | 143                        |
| Commercial                 | C     | 94  | 8.8             | 0.014             | 827                        |
| High Density Residential   | C     | 83  | 0.5             | 0.001             | 40                         |
| Medium Density Residential | B/D   | 70  | 10.0            | 0.016             | 699                        |
| Medium Density Residential | C     | 80  | 12.5            | 0.019             | 997                        |
| Medium Density Residential | D     | 85  | 34.0            | 0.053             | 2889                       |
| <b>Totals =</b>            |       |     | 82.0            | 0.128             | 6950.4                     |

Total (weighted) RCN = total product/total area = 84.76

RCN used = 85

#### Subbasin: FS-2A

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B/D   | 89  | 12.3            | 0.019             | 1091                       |
| Right-Of-Way               | C     | 92  | 5.1             | 0.008             | 467                        |
| Right-Of-Way               | D     | 93  | 4.2             | 0.007             | 392                        |
| Commercial                 | B/D   | 92  | 6.1             | 0.010             | 559                        |
| Commercial                 | C     | 94  | 0.2             | 0.000             | 21                         |
| Commercial                 | D     | 95  | 0.6             | 0.001             | 60                         |
| Medium Density Residential | B/D   | 70  | 39.9            | 0.062             | 2795                       |
| Medium Density Residential | C     | 80  | 18.9            | 0.030             | 1513                       |
| Medium Density Residential | D     | 85  | 12.2            | 0.019             | 1033                       |
| <b>Totals =</b>            |       |     | 99.5            | 0.155             | 7930.9                     |

Total (weighted) RCN = total product/total area = 79.73

RCN used = 80

**Subbasin: FS-2B**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | C     | 92  | 4.5             | 0.007             | 416                        |
| Right-Of-Way               | D     | 93  | 5.6             | 0.009             | 525                        |
| Medium Density Residential | C     | 80  | 15.7            | 0.025             | 1255                       |
| Medium Density Residential | D     | 85  | 22.8            | 0.036             | 1937                       |
| <b>Totals =</b>            |       |     | 48.7            | 0.076             | 4133.7                     |

**Total (weighted) RCN = total product/total area = 84.97**

**RCN used = 85**

**Subbasin: FS-3**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B     | 89  | 2.5             | 0.004             | 222                        |
| Right-Of-Way               | C     | 92  | 6.3             | 0.010             | 581                        |
| Right-Of-Way               | D     | 93  | 1.0             | 0.002             | 97                         |
| High Density Residential   | C     | 83  | 0.8             | 0.001             | 70                         |
| Medium Density Residential | B     | 70  | 8.1             | 0.013             | 570                        |
| Medium Density Residential | B/D   | 70  | 0.1             | 0.000             | 10                         |
| Medium Density Residential | C     | 80  | 23.5            | 0.037             | 1883                       |
| Medium Density Residential | D     | 85  | 11.0            | 0.017             | 939                        |
| <b>Totals =</b>            |       |     | 53.56           | 0.084             | 4371.4                     |

**Total (weighted) RCN = total product/total area = 81.62**

**RCN used = 82**

**Subbasin: FS-4A**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B     | 89  | 0.1             | 0.000             | 6                          |
| Right-Of-Way               | B/D   | 89  | 5.7             | 0.009             | 503                        |
| Right-Of-Way               | C     | 92  | 0.7             | 0.001             | 65                         |
| Right-Of-Way               | D     | 93  | 1.6             | 0.003             | 150                        |
| Commercial                 | B     | 92  | 0.2             | 0.000             | 19                         |
| Commercial                 | B/D   | 92  | 8.4             | 0.013             | 775                        |
| Commercial                 | C     | 94  | 8.5             | 0.013             | 801                        |
| Commercial                 | D     | 95  | 0.1             | 0.000             | 8                          |
| High Density Residential   | B/D   | 75  | 3.2             | 0.005             | 243                        |
| High Density Residential   | C     | 83  | 7.5             | 0.012             | 623                        |
| High Density Residential   | D     | 87  | 1.9             | 0.003             | 167                        |
| Medium Density Residential | B/D   | 70  | 17.6            | 0.028             | 1235                       |
| Medium Density Residential | C     | 80  | 1.9             | 0.003             | 152                        |
| Medium Density Residential | D     | 85  | 5.6             | 0.009             | 475                        |
| <b>Totals =</b>            |       |     | 63.1            | 0.099             | 5222.4                     |

**Total (weighted) RCN = total product/total area = 82.80**

**RCN used = 83**

**Subbasin: FS-4B**

| Landuse                    | Soil  |     | Area    | Area      | Product of   |
|----------------------------|-------|-----|---------|-----------|--------------|
|                            | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way               | B     | 89  | 0.6     | 0.001     | 52           |
| Right-Of-Way               | B/D   | 89  | 2.2     | 0.003     | 198          |
| Right-Of-Way               | C     | 92  | 8.1     | 0.013     | 744          |
| Right-Of-Way               | D     | 93  | 3.5     | 0.005     | 321          |
| Commercial                 | B     | 92  | 0.4     | 0.001     | 40           |
| Commercial                 | B/D   | 92  | 1.1     | 0.002     | 106          |
| Commercial                 | C     | 94  | 10.1    | 0.016     | 949          |
| Commercial                 | D     | 95  | 9.8     | 0.015     | 926          |
| High Density Residential   | B/D   | 75  | 7.9     | 0.012     | 595          |
| High Density Residential   | C     | 83  | 9.5     | 0.015     | 791          |
| High Density Residential   | D     | 87  | 2.8     | 0.004     | 247          |
| Medium Density Residential | B     | 70  | 2.0     | 0.003     | 143          |
| Medium Density Residential | B/D   | 70  | 1.9     | 0.003     | 135          |
| Medium Density Residential | C     | 80  | 10.7    | 0.017     | 858          |
| Medium Density Residential | D     | 85  | 4.5     | 0.007     | 381          |
| <b>Totals =</b>            |       |     | 75.3    | 0.118     | 6486.5       |

Total (weighted) RCN = total product/total area = 86.18

RCN used = 86

**Subbasin: FS-5**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 1.3     | 0.002     | 115          |
| Right-Of-Way                      | C     | 92  | 3.1     | 0.005     | 285          |
| Right-Of-Way                      | D     | 93  | 0.8     | 0.001     | 74           |
| Commerical                        | B     | 92  | 6.5     | 0.010     | 595          |
| Commerical                        | C     | 94  | 3.1     | 0.005     | 291          |
| Commerical                        | D     | 95  | 2.3     | 0.004     | 216          |
| Office/Institutional/Multi-Family | B     | 85  | 1.3     | 0.002     | 112          |
| Office/Institutional/Multi-Family | C     | 90  | 8.0     | 0.013     | 722          |
| Office/Institutional/Multi-Family | D     | 92  | 1.7     | 0.003     | 157          |
| High Density Residential          | C     | 83  | 3.6     | 0.006     | 298          |
| Conservation/Open Space           | D     | 84  | 1.3     | 0.002     | 110          |
| <b>Totals =</b>                   |       |     | 32.96   | 0.052     | 2974.6       |

Total (weighted) RCN = total product/total area = 90.24

RCN used = 90



**Subbasin: FS-6A**

| Landuse                          | Soil  |        | Area    | Area      | Product of   |
|----------------------------------|-------|--------|---------|-----------|--------------|
|                                  | Group | RCN    | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                     | B     | 89     | 1.1     | 0.002     | 96           |
| Right-Of-Way                     | B/D   | 89     | 2.3     | 0.004     | 204          |
| Right-Of-Way                     | C     | 92     | 9.1     | 0.014     | 839          |
| Right-Of-Way                     | D     | 93     | 2.5     | 0.004     | 233          |
| Commercial                       | A     | 89     | 1.8     | 0.003     | 163          |
| Commercial                       | B     | 92     | 1.4     | 0.002     | 129          |
| Commercial                       | B/D   | 92     | 3.4     | 0.005     | 313          |
| Commercial                       | C     | 94     | 19.5    | 0.030     | 1831         |
| Commercial                       | D     | 95     | 10.7    | 0.017     | 1016         |
| Office/Institutionl/Multi-Family | B     | 85     | 1.2     | 0.002     | 104          |
| Office/Institutionl/Multi-Family | B/D   | 85     | 2.1     | 0.003     | 182          |
| Office/Institutionl/Multi-Family | C     | 90     | 2.9     | 0.004     | 259          |
| Office/Institutionl/Multi-Family | D     | 92     | 1.0     | 0.002     | 90           |
| High Density Residential         | B     | 75     | 2.6     | 0.004     | 192          |
| High Density Residential         | B/D   | 75     | 5.6     | 0.009     | 417          |
| High Density Residential         | C     | 83     | 17.4    | 0.027     | 1445         |
| Medium Density Residential       | B     | 70     | 0.1     | 0.000     | 9            |
| Medium Density Residential       | B/D   | 70     | 2.3     | 0.004     | 162          |
| Medium Density Residential       | C     | 80     | 3.7     | 0.006     | 298          |
| Medium Density Residential       | D     | 85     | 1.0     | 0.002     | 83           |
| Low Density Residential          | D     | 84     | 3.1     | 0.005     | 261          |
| Very Low Density Residential     | B     | 69     | 0.6     | 0.001     | 39           |
| Very Low Density Residential     | B/D   | 69     | 3.6     | 0.006     | 252          |
| Very Low Density Residential     | C     | 79     | 1.9     | 0.003     | 151          |
| Conservation/Open Space          | B/D   | 69     | 0.7     | 0.001     | 49           |
| Conservation/Open Space          | C     | 79     | 0.5     | 0.001     | 41           |
| Conservation/Open Space          | D     | 84     | 1.8     | 0.003     | 150          |
| <b>Totals =</b>                  |       | 103.93 |         | 0.162     | 9006.2       |

**Total (weighted) RCN = total product/total area = 86.65**

**RCN used = 87**

**Subbasin: FS-6B**

| Landuse                    | Soil  |      | Area    | Area      | Product of   |
|----------------------------|-------|------|---------|-----------|--------------|
|                            | Group | RCN  | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way               | B     | 89   | 2.9     | 0.005     | 262          |
| Right-Of-Way               | B/D   | 89   | 6.1     | 0.009     | 541          |
| Right-Of-Way               | C     | 92   | 3.0     | 0.005     | 274          |
| Right-Of-Way               | D     | 93   | 0.8     | 0.001     | 77           |
| High Density Residential   | B     | 75   | 1.6     | 0.002     | 117          |
| High Density Residential   | B/D   | 75   | 1.7     | 0.003     | 129          |
| High Density Residential   | C     | 83   | 0.1     | 0.000     | 4            |
| High Density Residential   | D     | 87   | 0.5     | 0.001     | 43           |
| Medium Density Residential | B     | 70   | 2.7     | 0.004     | 190          |
| Medium Density Residential | B/D   | 70   | 5.0     | 0.008     | 351          |
| Medium Density Residential | C     | 80   | 8.2     | 0.013     | 655          |
| Medium Density Residential | D     | 85   | 0.0     | 0.000     | 1            |
| Low Density Residential    | B     | 68   | 4.4     | 0.007     | 296          |
| Low Density Residential    | B/D   | 68   | 13.7    | 0.021     | 930          |
| Low Density Residential    | C     | 79   | 5.5     | 0.009     | 433          |
| Low Density Residential    | D     | 84   | 1.9     | 0.003     | 163          |
| <b>Totals =</b>            |       | 58.0 |         | 0.091     | 4466.3       |

**Total (weighted) RCN = total product/total area = 76.96**

**RCN used = 77**

**Subbasin: FS-6C**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B     | 89  | 5.3             | 0.008             | 473                        |
| Right-Of-Way                      | B/D   | 89  | 1.1             | 0.002             | 102                        |
| Right-Of-Way                      | C     | 92  | 2.8             | 0.004             | 257                        |
| Right-Of-Way                      | D     | 93  | 4.2             | 0.007             | 391                        |
| Office/Institutional/Medical      | D     | 92  | 0.0             | 0.000             | 0                          |
| Office/Institutional/Multi-Family | A     | 77  | 1.3             | 0.002             | 100                        |
| Office/Institutional/Multi-Family | B     | 85  | 5.6             | 0.009             | 480                        |
| Office/Institutional/Multi-Family | B/D   | 85  | 0.0             | 0.000             | 2                          |
| Office/Institutional/Multi-Family | C     | 90  | 11.5            | 0.018             | 1031                       |
| Office/Institutional/Multi-Family | D     | 92  | 3.5             | 0.006             | 326                        |
| High Density Residential          | A     | 61  | 0.1             | 0.000             | 7                          |
| High Density Residential          | B     | 75  | 11.0            | 0.017             | 826                        |
| High Density Residential          | B/D   | 75  | 0.1             | 0.000             | 5                          |
| High Density Residential          | C     | 83  | 4.6             | 0.007             | 383                        |
| High Density Residential          | D     | 87  | 11.6            | 0.018             | 1007                       |
| Medium Density Residential        | B     | 70  | 4.6             | 0.007             | 325                        |
| Medium Density Residential        | B/D   | 70  | 0.2             | 0.000             | 13                         |
| Medium Density Residential        | C     | 80  | 9.8             | 0.015             | 781                        |
| Medium Density Residential        | D     | 85  | 6.6             | 0.010             | 561                        |
| Low Density Residential           | B     | 68  | 1.2             | 0.002             | 79                         |
| Low Density Residential           | B/D   | 68  | 3.8             | 0.006             | 257                        |
| Low Density Residential           | C     | 79  | 2.6             | 0.004             | 203                        |
| Low Density Residential           | D     | 84  | 1.6             | 0.002             | 131                        |
| Conservation/Open Space           | B/D   | 69  | 0.3             | 0.000             | 18                         |
| Conservation/Open Space           | C     | 79  | 0.6             | 0.001             | 49                         |
| Conservation/Open Space           | D     | 84  | 2.4             | 0.004             | 199                        |
| <b>Totals =</b>                   |       |     | 96.31           | 0.150             | 8004.8                     |

**Total (weighted) RCN = total product/total area = 83.12**

**RCN used = 83**

**Subbasin: FS-6D**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 0.1             | 0.000             | 6                          |
| Right-Of-Way                 | B     | 89  | 1.4             | 0.002             | 122                        |
| Right-Of-Way                 | B/D   | 89  | 2.4             | 0.004             | 213                        |
| Right-Of-Way                 | C     | 92  | 5.7             | 0.009             | 529                        |
| Right-Of-Way                 | D     | 93  | 2.8             | 0.004             | 256                        |
| High Density Residential     | A     | 61  | 0.5             | 0.001             | 29                         |
| High Density Residential     | B     | 75  | 0.0             | 0.000             | 0                          |
| High Density Residential     | C     | 83  | 0.0             | 0.000             | 2                          |
| High Density Residential     | D     | 87  | 0.5             | 0.001             | 42                         |
| Medium Density Residential   | A     | 54  | 0.2             | 0.000             | 11                         |
| Medium Density Residential   | B     | 70  | 5.7             | 0.009             | 402                        |
| Medium Density Residential   | B/D   | 70  | 9.7             | 0.015             | 680                        |
| Medium Density Residential   | C     | 80  | 21.2            | 0.033             | 1692                       |
| Medium Density Residential   | D     | 85  | 9.4             | 0.015             | 798                        |
| Very Low Density Residential | B     | 69  | 0.6             | 0.001             | 39                         |
| Very Low Density Residential | C     | 79  | 2.8             | 0.004             | 218                        |
| Very Low Density Residential | D     | 84  | 0.4             | 0.001             | 31                         |
| <b>Totals =</b>              |       |     | 63.22           | 0.099             | 5070.2                     |

**Total (weighted) RCN = total product/total area = 80.20**

**RCN used = 80**

**Subbasin: FS-6E**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A     | 83  | 1.4     | 0.002     | 113          |
| Right-Of-Way                      | B     | 89  | 3.2     | 0.005     | 285          |
| Right-Of-Way                      | B/D   | 89  | 0.2     | 0.000     | 16           |
| Right-Of-Way                      | C     | 92  | 2.5     | 0.004     | 229          |
| Right-Of-Way                      | D     | 93  | 0.8     | 0.001     | 79           |
| Commercial                        | A     | 89  | 0.0     | 0.000     | 0            |
| Commercial                        | C     | 94  | 0.5     | 0.001     | 45           |
| Commercial                        | D     | 95  | 1.4     | 0.002     | 137          |
| Office/Institutional/Multi-Family | A     | 77  | 1.5     | 0.002     | 115          |
| Office/Institutional/Multi-Family | B     | 85  | 2.6     | 0.004     | 219          |
| Office/Institutional/Multi-Family | C     | 90  | 0.6     | 0.001     | 57           |
| Office/Institutional/Multi-Family | D     | 92  | 2.9     | 0.005     | 267          |
| High Density Residential          | A     | 61  | 0.0     | 0.000     | 1            |
| High Density Residential          | B     | 75  | 4.1     | 0.006     | 308          |
| High Density Residential          | B/D   | 75  | 2.2     | 0.004     | 168          |
| High Density Residential          | C     | 83  | 4.0     | 0.006     | 333          |
| High Density Residential          | D     | 87  | 3.6     | 0.006     | 315          |
| Medium Density Residential        | A     | 54  | 3.1     | 0.005     | 168          |
| Medium Density Residential        | B     | 70  | 9.6     | 0.015     | 670          |
| Medium Density Residential        | B/D   | 70  | 5.1     | 0.008     | 354          |
| Medium Density Residential        | C     | 80  | 10.7    | 0.017     | 853          |
| Medium Density Residential        | D     | 85  | 6.4     | 0.010     | 548          |
| Conservation/Open Space           | D     | 84  | 1.4     | 0.002     | 120          |
| <b>Totals =</b>                   |       |     | 67.9    | 0.106     | 5401.3       |

**Total (weighted) RCN = total product/total area = 79.55**

**RCN used = 80**

**Subbasin: FS-6F**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A     | 83  | 0.3     | 0.000     | 22           |
| Right-Of-Way                      | B     | 89  | 5.4     | 0.008     | 479          |
| Right-Of-Way                      | B/D   | 89  | 0.3     | 0.000     | 25           |
| Right-Of-Way                      | C     | 92  | 8.1     | 0.013     | 747          |
| Right-Of-Way                      | D     | 93  | 2.6     | 0.004     | 243          |
| Industrial                        | B     | 88  | 4.7     | 0.007     | 410          |
| Industrial                        | C     | 91  | 2.6     | 0.004     | 240          |
| Industrial                        | D     | 93  | 1.0     | 0.002     | 96           |
| Commercial                        | D     | 95  | 0.0     | 0.000     | 3            |
| Office/Institutional/Medical      | C     | 90  | 1.7     | 0.003     | 151          |
| Office/Institutional/Medical      | D     | 92  | 0.4     | 0.001     | 39           |
| Office/Institutional/Multi-Family | C     | 90  | 6.6     | 0.010     | 592          |
| Office/Institutional/Multi-Family | D     | 92  | 0.3     | 0.000     | 26           |
| High Density Residential          | A     | 61  | 3.5     | 0.006     | 215          |
| High Density Residential          | B     | 75  | 12.5    | 0.020     | 937          |
| High Density Residential          | C     | 83  | 7.3     | 0.011     | 605          |
| High Density Residential          | D     | 87  | 8.6     | 0.013     | 745          |
| Medium Density Residential        | A     | 54  | 0.7     | 0.001     | 37           |
| Medium Density Residential        | B     | 70  | 15.3    | 0.024     | 1069         |
| Medium Density Residential        | B/D   | 70  | 0.3     | 0.000     | 18           |
| Medium Density Residential        | C     | 80  | 13.0    | 0.020     | 1041         |
| Medium Density Residential        | D     | 85  | 7.6     | 0.012     | 648          |
| Very Low Density Residential      | A     | 49  | 0.5     | 0.001     | 25           |
| Very Low Density Residential      | B     | 69  | 0.2     | 0.000     | 13           |
| Very Low Density Residential      | B/D   | 69  | 0.1     | 0.000     | 8            |
| Very Low Density Residential      | C     | 79  | 0.1     | 0.000     | 6            |
| Very Low Density Residential      | D     | 84  | 1.2     | 0.002     | 103          |
| Conservation/Open Space           | D     | 84  | 1.0     | 0.002     | 83           |
| <b>Totals =</b>                   |       |     | 105.8   | 0.165     | 8626.1       |

**Total (weighted) RCN = total product/total area = 81.53**

**RCN used = 82**

**Subbasin: FS-7A**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B     | 89  | 7.9     | 0.012     | 707          |
| Right-Of-Way                 | B/D   | 89  | 0.6     | 0.001     | 51           |
| Right-Of-Way                 | C     | 92  | 2.8     | 0.004     | 261          |
| Right-Of-Way                 | D     | 93  | 5.5     | 0.009     | 511          |
| Commercial                   | D     | 95  | 0.0     | 0.000     | 4            |
| High Density Residential     | B     | 75  | 12.2    | 0.019     | 917          |
| High Density Residential     | B/D   | 75  | 3.2     | 0.005     | 238          |
| High Density Residential     | C     | 83  | 4.8     | 0.008     | 399          |
| High Density Residential     | D     | 87  | 13.1    | 0.020     | 1139         |
| Medium Density Residential   | B     | 70  | 0.8     | 0.001     | 59           |
| Medium Density Residential   | C     | 80  | 4.5     | 0.007     | 357          |
| Medium Density Residential   | D     | 85  | 20.5    | 0.032     | 1742         |
| Very Low Density Residential | B     | 69  | 13.0    | 0.020     | 894          |
| Very Low Density Residential | B/D   | 69  | 0.0     | 0.000     | 1            |
| Very Low Density Residential | C     | 79  | 3.9     | 0.006     | 308          |
| Very Low Density Residential | D     | 84  | 1.8     | 0.003     | 154          |
| <b>Totals =</b>              |       |     | 94.7    | 0.148     | 7743.8       |

**Total (weighted) RCN = total product/total area = 81.76**

**RCN used = 82**

**Subbasin: FS-7B**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A     | 83  | 0.4     | 0.001     | 36           |
| Right-Of-Way                      | B     | 89  | 2.5     | 0.004     | 219          |
| Right-Of-Way                      | B/D   | 89  | 2.1     | 0.003     | 185          |
| Right-Of-Way                      | C     | 92  | 7.8     | 0.012     | 719          |
| Right-Of-Way                      | D     | 93  | 0.8     | 0.001     | 72           |
| Commercial                        | A     | 89  | 1.0     | 0.002     | 93           |
| Commercial                        | C     | 94  | 0.1     | 0.000     | 6            |
| Office/Institutional/Multi-Family | B     | 85  | 3.7     | 0.006     | 316          |
| Office/Institutional/Multi-Family | B/D   | 85  | 1.0     | 0.002     | 82           |
| Office/Institutional/Multi-Family | C     | 90  | 0.5     | 0.001     | 43           |
| High Density Residential          | A     | 61  | 0.2     | 0.000     | 15           |
| High Density Residential          | B     | 75  | 2.2     | 0.003     | 166          |
| High Density Residential          | B/D   | 75  | 0.7     | 0.001     | 56           |
| High Density Residential          | C     | 83  | 11.5    | 0.018     | 958          |
| High Density Residential          | D     | 87  | 1.6     | 0.003     | 139          |
| Medium Density Residential        | A     | 54  | 1.3     | 0.002     | 72           |
| Medium Density Residential        | B     | 70  | 12.6    | 0.020     | 881          |
| Medium Density Residential        | B/D   | 70  | 0.6     | 0.001     | 43           |
| Medium Density Residential        | C     | 80  | 22.2    | 0.035     | 1776         |
| Medium Density Residential        | D     | 85  | 4.0     | 0.006     | 343          |
| Very Low Density Residential      | C     | 79  | 5.9     | 0.009     | 463          |
| Conservation/Open Space           | A     | 49  | 0.1     | 0.000     | 4            |
| Conservation/Open Space           | B     | 69  | 0.1     | 0.000     | 5            |
| Conservation/Open Space           | B/D   | 69  | 4.0     | 0.006     | 273          |
| Conservation/Open Space           | C     | 79  | 2.1     | 0.003     | 163          |
| Conservation/Open Space           | D     | 84  | 7.9     | 0.012     | 662          |
| <b>Totals =</b>                   |       |     | 96.85   | 0.151     | 7789.8       |

**Total (weighted) RCN = total product/total area = 80.43**

**RCN used = 80**

**Subbasin: FS-8A**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B/D   | 89  | 0.9     | 0.001     | 82           |
| Right-Of-Way                 | C     | 92  | 4.0     | 0.006     | 366          |
| Industrial                   | C     | 91  | 3.7     | 0.006     | 336          |
| Office/Institutional/Medical | C     | 90  | 0.0     | 0.000     | 1            |
| Very Low Density Residential | B/D   | 69  | 15.9    | 0.025     | 1100         |
| Very Low Density Residential | C     | 79  | 13.9    | 0.022     | 1094         |
| Very Low Density Residential | D     | 84  | 2.6     | 0.004     | 222          |
| <b>Totals =</b>              |       |     | 41.03   | 0.064     | 3200.3       |

**Total (weighted) RCN = total product/total area = 78.00**

**RCN used = 78**

**Subbasin: FS-8B**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 2.2     | 0.003     | 196          |
| Right-Of-Way                      | B/D   | 89  | 8.2     | 0.013     | 732          |
| Right-Of-Way                      | C     | 92  | 3.1     | 0.005     | 281          |
| Mixed Use/Office/Institutional    | B     | 85  | 0.6     | 0.001     | 51           |
| Mixed Use/Office/Institutional    | B/D   | 85  | 0.2     | 0.000     | 19           |
| Mixed Use/Office/Institutional    | C     | 90  | 1.4     | 0.002     | 128          |
| Office/Institutional/Medical      | B     | 85  | 1.7     | 0.003     | 143          |
| Office/Institutional/Medical      | B/D   | 85  | 0.1     | 0.000     | 9            |
| Office/Institutional/Medical      | C     | 90  | 4.3     | 0.007     | 383          |
| Office/Institutional/Multi-Family | B     | 85  | 0.1     | 0.000     | 8            |
| Office/Institutional/Multi-Family | C     | 90  | 0.2     | 0.000     | 20           |
| Medium Density Residential        | B     | 70  | 0.4     | 0.001     | 31           |
| Medium Density Residential        | B/D   | 70  | 0.0     | 0.000     | 2            |
| Medium Density Residential        | C     | 80  | 2.3     | 0.004     | 184          |
| Medium Density Residential        | D     | 85  | 0.1     | 0.000     | 8            |
| Low Density Residential           | A     | 51  | 0.5     | 0.001     | 27           |
| Low Density Residential           | B     | 68  | 5.2     | 0.008     | 353          |
| Low Density Residential           | B/D   | 68  | 37.0    | 0.058     | 2519         |
| Low Density Residential           | C     | 79  | 9.5     | 0.015     | 751          |
| Low Density Residential           | D     | 84  | 3.1     | 0.005     | 263          |
| <b>Totals =</b>                   |       |     | 80.34   | 0.126     | 6106.8       |

**Total (weighted) RCN = total product/total area = 76.01**

**RCN used = 76**

**Subbasin: FS-8C**

| Landuse                           | Soil  | RCN   | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-------|-----------------|-------------------|----------------------------|
|                                   | Group |       |                 |                   |                            |
| Right-Of-Way                      | A     | 83    | 0.8             | 0.001             | 70                         |
| Right-Of-Way                      | B     | 89    | 0.8             | 0.001             | 71                         |
| Right-Of-Way                      | C     | 92    | 6.0             | 0.009             | 547                        |
| Commercial                        | B     | 92    | 2.4             | 0.004             | 221                        |
| Commercial                        | C     | 94    | 3.4             | 0.005             | 321                        |
| Mixed Use/Office/Institutional    | A     | 77    | 0.0             | 0.000             | 4                          |
| Mixed Use/Office/Institutional    | B     | 85    | 0.0             | 0.000             | 3                          |
| Mixed Use/Office/Institutional    | C     | 90    | 0.5             | 0.001             | 43                         |
| Office/Institutional/Multi-Family | A     | 77    | 0.3             | 0.000             | 21                         |
| Office/Institutional/Multi-Family | B     | 85    | 6.9             | 0.011             | 583                        |
| Office/Institutional/Multi-Family | B/D   | 85    | 1.1             | 0.002             | 96                         |
| Office/Institutional/Multi-Family | C     | 90    | 3.7             | 0.006             | 332                        |
| High Density Residential          | A     | 61    | 3.8             | 0.006             | 234                        |
| High Density Residential          | B     | 75    | 1.3             | 0.002             | 99                         |
| High Density Residential          | B/D   | 75    | 0.2             | 0.000             | 15                         |
| High Density Residential          | C     | 83    | 5.5             | 0.009             | 455                        |
| Medium Density Residential        | A     | 54    | 0.3             | 0.000             | 16                         |
| Medium Density Residential        | B     | 70    | 6.2             | 0.010             | 437                        |
| Medium Density Residential        | B/D   | 70    | 6.9             | 0.011             | 486                        |
| Medium Density Residential        | C     | 80    | 7.9             | 0.012             | 636                        |
| Very Low Density Residential      | C     | 79    | 2.3             | 0.004             | 181                        |
| <b>Totals =</b>                   |       | 60.49 | 0.095           | 4871.8            |                            |

**Total (weighted) RCN = total product/total area = 80.54**

**RCN used = 81**

**Subbasin: FS-8D**

| Landuse                      | Soil  | RCN   | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-------|-----------------|-------------------|----------------------------|
|                              | Group |       |                 |                   |                            |
| Right-Of-Way                 | A     | 83    | 0.7             | 0.001             | 57                         |
| Right-Of-Way                 | B     | 89    | 0.6             | 0.001             | 55                         |
| Right-Of-Way                 | B/D   | 89    | 3.0             | 0.005             | 270                        |
| Right-Of-Way                 | C     | 92    | 3.3             | 0.005             | 305                        |
| High Density Residential     | C     | 83    | 0.2             | 0.000             | 13                         |
| Medium Density Residential   | A     | 54    | 3.8             | 0.006             | 205                        |
| Medium Density Residential   | B     | 70    | 3.2             | 0.005             | 227                        |
| Medium Density Residential   | B/D   | 70    | 15.8            | 0.025             | 1109                       |
| Medium Density Residential   | C     | 80    | 6.4             | 0.010             | 512                        |
| Very Low Density Residential | A     | 49    | 0.4             | 0.001             | 17                         |
| Very Low Density Residential | B     | 69    | 1.5             | 0.002             | 104                        |
| Very Low Density Residential | B/D   | 69    | 0.0             | 0.000             | 0                          |
| Very Low Density Residential | C     | 79    | 4.2             | 0.007             | 333                        |
| Conservation/Open Space      | B/D   | 69    | 1.3             | 0.002             | 88                         |
| Conservation/Open Space      | D     | 84    | 0.1             | 0.000             | 5                          |
| <b>Totals =</b>              |       | 44.48 | 0.070           | 3298.6            |                            |

**Total (weighted) RCN = total product/total area = 74.16**

**RCN used = 74**

**Subbasin: FS-8E**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A     | 83  | 1.7             | 0.003             | 139                        |
| Right-Of-Way                      | B     | 89  | 1.1             | 0.002             | 97                         |
| Right-Of-Way                      | B/D   | 89  | 1.4             | 0.002             | 120                        |
| Right-Of-Way                      | C     | 92  | 1.0             | 0.002             | 89                         |
| Right-Of-Way                      | D     | 93  | 0.0             | 0.000             | 2                          |
| Commercial                        | B     | 92  | 0.1             | 0.000             | 10                         |
| Commercial                        | C     | 94  | 0.3             | 0.000             | 24                         |
| Office/Institutional/Multi-Family | B     | 85  | 0.3             | 0.000             | 25                         |
| Office/Institutional/Multi-Family | C     | 90  | 0.2             | 0.000             | 15                         |
| Office/Institutional/Multi-Family | D     | 92  | 1.4             | 0.002             | 125                        |
| High Density Residential          | A     | 61  | 9.3             | 0.015             | 567                        |
| High Density Residential          | B     | 75  | 8.1             | 0.013             | 611                        |
| High Density Residential          | B/D   | 75  | 13.6            | 0.021             | 1017                       |
| High Density Residential          | C     | 83  | 6.0             | 0.009             | 501                        |
| High Density Residential          | D     | 87  | 0.6             | 0.001             | 48                         |
| Medium Density Residential        | A     | 54  | 4.4             | 0.007             | 235                        |
| Medium Density Residential        | B     | 70  | 1.0             | 0.002             | 69                         |
| Medium Density Residential        | B/D   | 70  | 11.7            | 0.018             | 820                        |
| Medium Density Residential        | C     | 80  | 4.1             | 0.006             | 331                        |
| Very Low Density Residential      | B     | 69  | 1.3             | 0.002             | 87                         |
| Very Low Density Residential      | B/D   | 69  | 0.2             | 0.000             | 13                         |
| Very Low Density Residential      | D     | 84  | 0.2             | 0.000             | 20                         |
| Conservation/Open Space           | A     | 49  | 0.9             | 0.001             | 42                         |
| Conservation/Open Space           | B     | 69  | 0.3             | 0.000             | 18                         |
| Conservation/Open Space           | B/D   | 69  | 9.4             | 0.015             | 649                        |
| Conservation/Open Space           | C     | 79  | 0.2             | 0.000             | 13                         |
| <b>Totals =</b>                   |       |     | 78.44           | 0.123             | 5686.4                     |

**Total (weighted) RCN = total product/total area = 72.49**

**RCN used = 72**

**Subbasin: FS-9**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 0.6             | 0.001             | 53                         |
| Right-Of-Way                 | B     | 89  | 0.6             | 0.001             | 49                         |
| Right-Of-Way                 | B/D   | 89  | 0.7             | 0.001             | 64                         |
| Right-Of-Way                 | C     | 92  | 0.0             | 0.000             | 3                          |
| Medium Density Residential   | A     | 54  | 4.4             | 0.007             | 238                        |
| Medium Density Residential   | B     | 70  | 1.2             | 0.002             | 86                         |
| Medium Density Residential   | B/D   | 70  | 8.9             | 0.014             | 620                        |
| Medium Density Residential   | C     | 80  | 1.0             | 0.002             | 83                         |
| Medium Density Residential   | D     | 85  | 0.1             | 0.000             | 12                         |
| Very Low Density Residential | A     | 49  | 0.7             | 0.001             | 34                         |
| Very Low Density Residential | B     | 69  | 1.9             | 0.003             | 129                        |
| Very Low Density Residential | B/D   | 69  | 6.5             | 0.010             | 447                        |
| Very Low Density Residential | C     | 79  | 1.2             | 0.002             | 97                         |
| Conservation/Open Space      | B     | 69  | 3.6             | 0.006             | 250                        |
| Conservation/Open Space      | B/D   | 69  | 32.3            | 0.050             | 2226                       |
| Conservation/Open Space      | C     | 79  | 5.2             | 0.008             | 413                        |
| Conservation/Open Space      | D     | 84  | 20.2            | 0.032             | 1698                       |
| <b>Totals =</b>              |       |     | 89.20           | 0.139             | 6500.9                     |

**Total (weighted) RCN = total product/total area = 72.88**

**RCN used = 73**

**Subbasin: FS-10A**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B     | 89  | 0.5     | 0.001     | 45           |
| Right-Of-Way                 | B/D   | 89  | 0.4     | 0.001     | 37           |
| Right-Of-Way                 | C     | 92  | 1.6     | 0.003     | 148          |
| Right-Of-Way                 | D     | 93  | 0.5     | 0.001     | 51           |
| Commercial                   | B     | 92  | 0.8     | 0.001     | 69           |
| High Density Residential     | B     | 75  | 2.4     | 0.004     | 179          |
| High Density Residential     | B/D   | 75  | 2.1     | 0.003     | 159          |
| High Density Residential     | C     | 83  | 5.8     | 0.009     | 477          |
| High Density Residential     | D     | 87  | 1.4     | 0.002     | 118          |
| Very Low Density Residential | B     | 69  | 1.9     | 0.003     | 132          |
| Very Low Density Residential | B/D   | 69  | 0.1     | 0.000     | 6            |
| Very Low Density Residential | C     | 79  | 2.2     | 0.003     | 174          |
| Very Low Density Residential | D     | 84  | 1.9     | 0.003     | 156          |
| <b>Totals =</b>              |       |     | 21.47   | 0.034     | 1749.2       |

**Total (weighted) RCN = total product/total area = 81.45**

**RCN used = 81**

**Subbasin: FS-10B**

| Landuse                        | Soil  |     | Area    | Area      | Product of   |
|--------------------------------|-------|-----|---------|-----------|--------------|
|                                | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                   | A     | 83  | 1.6     | 0.002     | 132          |
| Right-Of-Way                   | B     | 89  | 2.1     | 0.003     | 187          |
| Right-Of-Way                   | B/D   | 89  | 4.3     | 0.007     | 383          |
| Right-Of-Way                   | C     | 92  | 2.5     | 0.004     | 228          |
| Right-Of-Way                   | D     | 93  | 0.0     | 0.000     | 0            |
| Mixed Use/Office/Institutional | B     | 85  | 1.6     | 0.002     | 134          |
| Mixed Use/Office/Institutional | C     | 90  | 0.3     | 0.000     | 27           |
| Mixed Use/Office/Institutional | D     | 92  | 0.6     | 0.001     | 55           |
| High Density Residential       | A     | 61  | 0.1     | 0.000     | 4            |
| High Density Residential       | C     | 83  | 0.3     | 0.000     | 26           |
| High Density Residential       | D     | 87  | 0.1     | 0.000     | 8            |
| Medium Density Residential     | A     | 54  | 0.1     | 0.000     | 5            |
| Medium Density Residential     | B/D   | 70  | 0.8     | 0.001     | 55           |
| Medium Density Residential     | D     | 85  | 0.4     | 0.001     | 34           |
| Low Density Residential        | B     | 68  | 0.6     | 0.001     | 38           |
| Low Density Residential        | B/D   | 68  | 5.3     | 0.008     | 358          |
| Low Density Residential        | D     | 84  | 0.3     | 0.000     | 21           |
| Very Low Density Residential   | A     | 49  | 8.3     | 0.013     | 405          |
| Very Low Density Residential   | B     | 69  | 17.7    | 0.028     | 1222         |
| Very Low Density Residential   | B/D   | 69  | 36.7    | 0.057     | 2533         |
| Very Low Density Residential   | C     | 79  | 9.7     | 0.015     | 769          |
| Very Low Density Residential   | D     | 84  | 4.8     | 0.008     | 405          |
| Conservation/Open Space        | D     | 84  | 0.0     | 0.000     | 0            |
| <b>Totals =</b>                |       |     | 98.04   | 0.153     | 7030.7       |

**Total (weighted) RCN = total product/total area = 71.72**

**RCN used = 72**



**Subbasin: FS-10C**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B     | 89  | 3.8     | 0.006     | 334          |
| Right-Of-Way                 | C     | 92  | 1.1     | 0.002     | 98           |
| Right-Of-Way                 | D     | 93  | 0.8     | 0.001     | 77           |
| Medium Density Residential   | B     | 70  | 9.5     | 0.015     | 663          |
| Medium Density Residential   | B/D   | 70  | 5.7     | 0.009     | 396          |
| Medium Density Residential   | C     | 80  | 4.1     | 0.006     | 327          |
| Medium Density Residential   | D     | 85  | 6.3     | 0.010     | 536          |
| Low Density Residential      | B     | 68  | 12.4    | 0.019     | 846          |
| Low Density Residential      | B/D   | 68  | 6.5     | 0.010     | 440          |
| Low Density Residential      | C     | 79  | 0.2     | 0.000     | 15           |
| Low Density Residential      | D     | 84  | 4.6     | 0.007     | 385          |
| Very Low Density Residential | D     | 84  | 0.3     | 0.001     | 28           |
| Conservation/Open Space      | B     | 69  | 0.5     | 0.001     | 31           |
| Conservation/Open Space      | B/D   | 69  | 5.3     | 0.008     | 368          |
| Conservation/Open Space      | D     | 84  | 4.5     | 0.007     | 381          |
| <b>Totals =</b>              |       |     | 65.50   | 0.102     | 4924.7       |

**Total (weighted) RCN = total product/total area = 75.19**

**RCN used = 75**

**Subbasin: FS-10D**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B     | 89  | 8.2     | 0.013     | 729          |
| Right-Of-Way                 | C     | 92  | 9.1     | 0.014     | 837          |
| Right-Of-Way                 | D     | 93  | 5.2     | 0.008     | 488          |
| Medium Density Residential   | B     | 70  | 9.7     | 0.015     | 679          |
| Medium Density Residential   | B/D   | 70  | 0.2     | 0.000     | 15           |
| Medium Density Residential   | C     | 80  | 31.3    | 0.049     | 2508         |
| Medium Density Residential   | D     | 85  | 13.6    | 0.021     | 1156         |
| Low Density Residential      | B     | 68  | 25.0    | 0.039     | 1702         |
| Low Density Residential      | B/D   | 68  | 0.0     | 0.000     | 3            |
| Low Density Residential      | C     | 79  | 6.5     | 0.010     | 514          |
| Low Density Residential      | D     | 84  | 4.3     | 0.007     | 360          |
| Very Low Density Residential | B     | 69  | 0.5     | 0.001     | 32           |
| Very Low Density Residential | C     | 79  | 1.7     | 0.003     | 136          |
| Very Low Density Residential | D     | 84  | 0.1     | 0.000     | 9            |
| Conservation/Open Space      | B     | 69  | 0.0     | 0.000     | 2            |
| Conservation/Open Space      | D     | 84  | 0.1     | 0.000     | 9            |
| <b>Totals =</b>              |       |     | 115.67  | 0.181     | 9177.4       |

**Total (weighted) RCN = total product/total area = 79.34**

**RCN used = 79**

**Subbasin: FS-10E**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B     | 89  | 0.4     | 0.001     | 35           |
| Right-Of-Way                 | B/D   | 89  | 1.5     | 0.002     | 138          |
| Right-Of-Way                 | C     | 92  | 0.9     | 0.001     | 83           |
| Commercial                   | D     | 95  | 0.0     | 0.000     | 2            |
| Medium Density Residential   | B     | 70  | 1.2     | 0.002     | 85           |
| Medium Density Residential   | B/D   | 70  | 8.3     | 0.013     | 583          |
| Medium Density Residential   | C     | 80  | 2.9     | 0.004     | 230          |
| Medium Density Residential   | D     | 85  | 0.1     | 0.000     | 6            |
| Low Density Residential      | B     | 68  | 0.4     | 0.001     | 28           |
| Low Density Residential      | B/D   | 68  | 4.8     | 0.008     | 328          |
| Low Density Residential      | C     | 79  | 4.8     | 0.008     | 383          |
| Low Density Residential      | D     | 84  | 3.1     | 0.005     | 264          |
| Very Low Density Residential | D     | 84  | 0.2     | 0.000     | 20           |
| Conservation/Open Space      | B/D   | 69  | 6.1     | 0.010     | 423          |
| Conservation/Open Space      | D     | 84  | 7.1     | 0.011     | 593          |
| <b>Totals =</b>              |       |     | 41.98   | 0.066     | 3198.8       |

Total (weighted) RCN = total product/total area = 76.19

RCN used = 76

**Subbasin: FS-10F**

| Landuse                      | Soil  |     | Area    | Area      | Product of   |
|------------------------------|-------|-----|---------|-----------|--------------|
|                              | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                 | B     | 89  | 0.5     | 0.001     | 46           |
| Right-Of-Way                 | C     | 92  | 0.6     | 0.001     | 58           |
| Commercial                   | B     | 92  | 0.5     | 0.001     | 49           |
| Commercial                   | C     | 94  | 1.3     | 0.002     | 119          |
| Very Low Density Residential | B     | 69  | 11.6    | 0.018     | 803          |
| Very Low Density Residential | B/D   | 69  | 9.9     | 0.015     | 681          |
| Very Low Density Residential | C     | 79  | 4.0     | 0.006     | 316          |
| Very Low Density Residential | D     | 84  | 7.0     | 0.011     | 584          |
| Conservation/Open Space      | A     | 49  | 13.3    | 0.021     | 653          |
| Conservation/Open Space      | B/D   | 69  | 28.1    | 0.044     | 1939         |
| Conservation/Open Space      | C     | 79  | 13.3    | 0.021     | 1052         |
| Conservation/Open Space      | D     | 84  | 8.2     | 0.013     | 691          |
| <b>Totals =</b>              |       |     | 98.39   | 0.154     | 6992.3       |

Total (weighted) RCN = total product/total area = 71.07

RCN used = 71

**Subbasin: FSUT1-1A**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 2.3     | 0.004     | 208          |
| Right-Of-Way                      | B/D   | 89  | 6.1     | 0.009     | 540          |
| Right-Of-Way                      | C     | 92  | 3.3     | 0.005     | 306          |
| Right-Of-Way                      | D     | 93  | 2.0     | 0.003     | 185          |
| Commercial                        | B     | 92  | 0.6     | 0.001     | 55           |
| Commercial                        | B/D   | 92  | 6.4     | 0.010     | 593          |
| Commercial                        | C     | 94  | 1.1     | 0.002     | 101          |
| Commercial                        | D     | 95  | 2.5     | 0.004     | 242          |
| Office/Institutional/Multi-Family | B     | 85  | 6.3     | 0.010     | 537          |
| Office/Institutional/Multi-Family | B/D   | 85  | 12.3    | 0.019     | 1046         |
| Office/Institutional/Multi-Family | C     | 90  | 7.9     | 0.012     | 709          |
| Office/Institutional/Multi-Family | D     | 92  | 0.0     | 0.000     | 0            |
| Medium Density Residential        | B     | 70  | 9.0     | 0.014     | 630          |
| Medium Density Residential        | B/D   | 70  | 20.6    | 0.032     | 1443         |
| Medium Density Residential        | C     | 80  | 12.1    | 0.019     | 966          |
| Very Low Density Residential      | B     | 69  | 7.6     | 0.012     | 523          |
| Very Low Density Residential      | B/D   | 69  | 28.3    | 0.044     | 1951         |
| Very Low Density Residential      | C     | 79  | 9.0     | 0.014     | 708          |
| Very Low Density Residential      | D     | 84  | 20.0    | 0.031     | 1677         |
| Conservation/Open Space           | B/D   | 69  | 37.6    | 0.059     | 2592         |
| Conservation/Open Space           | D     | 84  | 62.8    | 0.098     | 5276         |
| <b>Totals =</b>                   |       |     | 257.73  | 0.403     | 20288.2      |

**Total (weighted) RCN = total product/total area = 78.72**

**RCN used = 79**

**Subbasin: FSUT1-1B**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 1.7     | 0.003     | 156          |
| Right-Of-Way                      | B/D   | 89  | 0.8     | 0.001     | 71           |
| Right-Of-Way                      | C     | 92  | 3.3     | 0.005     | 302          |
| Right-Of-Way                      | D     | 93  | 3.8     | 0.006     | 357          |
| Commercial                        | B     | 92  | 3.5     | 0.006     | 326          |
| Commercial                        | C     | 94  | 5.1     | 0.008     | 477          |
| Office/Institutional/Multi-Family | B     | 85  | 4.2     | 0.007     | 359          |
| Office/Institutional/Multi-Family | C     | 90  | 1.4     | 0.002     | 124          |
| Office/Institutional/Multi-Family | D     | 92  | 0.4     | 0.001     | 33           |
| Medium Density Residential        | B     | 75  | 3.6     | 0.006     | 268          |
| Medium Density Residential        | B/D   | 75  | 2.5     | 0.004     | 187          |
| Medium Density Residential        | C     | 83  | 2.0     | 0.003     | 166          |
| Medium Density Residential        | D     | 87  | 0.8     | 0.001     | 69           |
| Very Low Density Residential      | B     | 69  | 12.2    | 0.019     | 843          |
| Very Low Density Residential      | B/D   | 69  | 19.8    | 0.031     | 1367         |
| Very Low Density Residential      | C     | 79  | 79.4    | 0.124     | 6271         |
| Very Low Density Residential      | D     | 84  | 101.6   | 0.159     | 8534         |
| Very Low Density Residential      | W     | 100 | 0.9     | 0.001     | 90           |
| Conservation/Open Space           | B/D   | 69  | 0.1     | 0.000     | 6            |
| Conservation/Open Space           | C     | 79  | 4.5     | 0.007     | 356          |
| Conservation/Open Space           | D     | 84  | 0.6     | 0.001     | 50           |
| <b>Totals =</b>                   |       |     | 252.21  | 0.394     | 20412.9      |

**Total (weighted) RCN = total product/total area = 80.94**

**RCN used = 81**

**Subbasin: FSUT1-1C**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B     | 89  | 1.6             | 0.002             | 139                        |
| Right-Of-Way                      | B/D   | 89  | 0.1             | 0.000             | 5                          |
| Right-Of-Way                      | C     | 92  | 2.1             | 0.003             | 191                        |
| Right-Of-Way                      | D     | 93  | 0.2             | 0.000             | 14                         |
| Commercial                        | B     | 92  | 0.3             | 0.000             | 25                         |
| Commercial                        | B/D   | 92  | 2.2             | 0.003             | 202                        |
| Commercial                        | C     | 94  | 1.8             | 0.003             | 173                        |
| Office/Institutional/Medical      | C     | 90  | 1.2             | 0.002             | 109                        |
| Office/Institutional/Medical      | D     | 92  | 0.5             | 0.001             | 48                         |
| Office/Institutional/Multi-Family | B     | 85  | 5.1             | 0.008             | 436                        |
| Office/Institutional/Multi-Family | B/D   | 85  | 1.8             | 0.003             | 151                        |
| Office/Institutional/Multi-Family | C     | 90  | 1.3             | 0.002             | 114                        |
| Office/Institutional/Multi-Family | D     | 92  | 0.8             | 0.001             | 73                         |
| High Density Residential          | B/D   | 75  | 0.0             | 0.000             | 2                          |
| High Density Residential          | C     | 83  | 0.1             | 0.000             | 10                         |
| Medium Density Residential        | B     | 70  | 45.4            | 0.071             | 3177                       |
| Medium Density Residential        | B/D   | 70  | 4.6             | 0.007             | 323                        |
| Medium Density Residential        | C     | 80  | 34.0            | 0.053             | 2720                       |
| Medium Density Residential        | D     | 85  | 52.4            | 0.082             | 4458                       |
| Very Low Density Residential      | B     | 69  | 5.8             | 0.009             | 400                        |
| Very Low Density Residential      | B/D   | 69  | 0.2             | 0.000             | 16                         |
| Very Low Density Residential      | C     | 79  | 1.6             | 0.003             | 127                        |
| Very Low Density Residential      | D     | 84  | 8.8             | 0.014             | 737                        |
| <b>Totals =</b>                   |       |     | 171.87          | 0.269             | 13651.2                    |

**Total (weighted) RCN = total product/total area = 79.43**

**RCN used = 79**

**Subbasin: FSUT1-2A**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B     | 89  | 0.0             | 0.000             | 1                          |
| Right-Of-Way                      | B/D   | 89  | 0.6             | 0.001             | 50                         |
| Office/Institutional/Multi-Family | B/D   | 85  | 2.0             | 0.003             | 169                        |
| Office/Institutional/Multi-Family | C     | 90  | 0.1             | 0.000             | 11                         |
| Medium Density Residential        | B     | 70  | 8.8             | 0.014             | 616                        |
| Medium Density Residential        | B/D   | 70  | 37.5            | 0.059             | 2626                       |
| Medium Density Residential        | C     | 80  | 45.6            | 0.071             | 3647                       |
| Medium Density Residential        | D     | 85  | 9.8             | 0.015             | 837                        |
| Conservation/Open Space           | B     | 69  | 2.1             | 0.003             | 147                        |
| Conservation/Open Space           | B/D   | 69  | 70.9            | 0.111             | 4894                       |
| Conservation/Open Space           | C     | 79  | 59.5            | 0.093             | 4698                       |
| Conservation/Open Space           | D     | 84  | 52.5            | 0.082             | 4408                       |
| <b>Totals =</b>                   |       |     | 289.43          | 0.452             | 22103.6                    |

**Total (weighted) RCN = total product/total area = 76.37**

**RCN used = 76**

**Subbasin: FSUT1-2B**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | C     | 92  | 0.7             | 0.001             | 60                         |
| High Density Residential   | B     | 75  | 0.6             | 0.001             | 48                         |
| High Density Residential   | B/D   | 75  | 9.7             | 0.015             | 726                        |
| High Density Residential   | C     | 83  | 39.9            | 0.062             | 3312                       |
| High Density Residential   | D     | 87  | 0.9             | 0.001             | 76                         |
| Medium Density Residential | B     | 70  | 11.4            | 0.018             | 795                        |
| Medium Density Residential | C     | 80  | 67.1            | 0.105             | 5372                       |
| Medium Density Residential | D     | 85  | 5.9             | 0.009             | 498                        |
| Conservation/Open Space    | B     | 69  | 2.6             | 0.004             | 181                        |
| Conservation/Open Space    | C     | 79  | 14.8            | 0.023             | 1173                       |
| <b>Totals =</b>            |       |     | 153.57          | 0.240             | 12239.9                    |

**Total (weighted) RCN = total product/total area = 79.70**

**RCN used = 80**

**Subbasin: FSUT1-2C**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | A     | 83  | 0.3             | 0.000             | 24                         |
| Right-Of-Way               | A/D   | 83  | 1.9             | 0.003             | 159                        |
| Right-Of-Way               | B     | 89  | 0.9             | 0.001             | 76                         |
| Right-Of-Way               | B/D   | 89  | 1.6             | 0.003             | 143                        |
| Right-Of-Way               | C     | 92  | 5.2             | 0.008             | 482                        |
| Commercial                 | B/D   | 92  | 1.1             | 0.002             | 97                         |
| Commercial                 | C     | 94  | 1.1             | 0.002             | 99                         |
| High Density Residential   | A     | 61  | 0.8             | 0.001             | 46                         |
| High Density Residential   | B     | 75  | 1.2             | 0.002             | 89                         |
| High Density Residential   | B/D   | 75  | 0.3             | 0.001             | 26                         |
| High Density Residential   | C     | 83  | 0.2             | 0.000             | 19                         |
| Medium Density Residential | A     | 54  | 0.1             | 0.000             | 5                          |
| Medium Density Residential | A/D   | 54  | 12.5            | 0.019             | 674                        |
| Medium Density Residential | B     | 70  | 2.4             | 0.004             | 171                        |
| Medium Density Residential | B/D   | 70  | 9.0             | 0.014             | 630                        |
| Medium Density Residential | C     | 80  | 21.8            | 0.034             | 1742                       |
| Low Density Residential    | B     | 68  | 0.0             | 0.000             | 1                          |
| Low Density Residential    | C     | 79  | 2.8             | 0.004             | 218                        |
| Low Density Residential    | D     | 84  | 0.8             | 0.001             | 68                         |
| Very Low Residential       | A     | 49  | 0.4             | 0.001             | 18                         |
| Very Low Residential       | A/D   | 49  | 4.7             | 0.007             | 231                        |
| Very Low Residential       | B/D   | 69  | 1.1             | 0.002             | 79                         |
| Very Low Residential       | C     | 79  | 0.9             | 0.001             | 75                         |
| <b>Totals =</b>            |       |     | 71.09           | 0.111             | 5172.8                     |

**Total (weighted) RCN = total product/total area = 72.76**

**RCN used = 73**

**Subbasin: FSUT1-2D**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A/D   | 83  | 0.2             | 0.000             | 21                         |
| Right-Of-Way                 | B     | 89  | 3.5             | 0.005             | 307                        |
| Right-Of-Way                 | B/D   | 89  | 0.6             | 0.001             | 55                         |
| Right-Of-Way                 | C     | 92  | 5.4             | 0.008             | 498                        |
| Right-Of-Way                 | D     | 93  | 0.6             | 0.001             | 52                         |
| Commercial                   | B/D   | 92  | 0.0             | 0.000             | 2                          |
| Commercial                   | C     | 94  | 0.4             | 0.001             | 33                         |
| High Density Residential     | C     | 83  | 0.0             | 0.000             | 1                          |
| Medium Density Residential   | A/D   | 54  | 0.7             | 0.001             | 39                         |
| Medium Density Residential   | B     | 70  | 21.3            | 0.033             | 1488                       |
| Medium Density Residential   | B/D   | 70  | 2.1             | 0.003             | 145                        |
| Medium Density Residential   | C     | 80  | 34.5            | 0.054             | 2761                       |
| Medium Density Residential   | D     | 85  | 10.4            | 0.016             | 883                        |
| Very Low Density Residential | B     | 69  | 7.7             | 0.012             | 529                        |
| Very Low Density Residential | C     | 79  | 16.5            | 0.026             | 1306                       |
| Very Low Density Residential | D     | 84  | 3.0             | 0.005             | 253                        |
| Conservation/Open Space      | C     | 79  | 1.5             | 0.002             | 116                        |
| Conservation/Open Space      | D     | 84  | 5.7             | 0.009             | 481                        |
| <b>Totals =</b>              |       |     | 114.03          | 0.178             | 8969.5                     |

**Total (weighted) RCN = total product/total area = 78.66**

**RCN used = 79**

**Subbasin: FSUT1-2E**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 1.2             | 0.002             | 100                        |
| Right-Of-Way                 | A/D   | 83  | 0.4             | 0.001             | 32                         |
| Right-Of-Way                 | B     | 89  | 3.8             | 0.006             | 342                        |
| Right-Of-Way                 | B/D   | 89  | 0.2             | 0.000             | 21                         |
| Right-Of-Way                 | C     | 92  | 1.7             | 0.003             | 153                        |
| Office/Institutional/Medical | A/D   | 77  | 2.4             | 0.004             | 186                        |
| Office/Institutional/Medical | B     | 85  | 14.7            | 0.023             | 1253                       |
| Office/Institutional/Medical | C     | 90  | 9.5             | 0.015             | 857                        |
| Office/Institutional/Medical | D     | 92  | 2.8             | 0.004             | 262                        |
| Medium Density Residential   | A     | 54  | 4.8             | 0.008             | 262                        |
| Medium Density Residential   | A/D   | 54  | 0.1             | 0.000             | 5                          |
| Medium Density Residential   | B     | 70  | 17.0            | 0.027             | 1193                       |
| Medium Density Residential   | B/D   | 70  | 2.4             | 0.004             | 166                        |
| Medium Density Residential   | C     | 80  | 23.0            | 0.036             | 1843                       |
| Medium Density Residential   | D     | 85  | 8.1             | 0.013             | 692                        |
| Very Low Density Residential | B     | 69  | 0.0             | 0.000             | 0                          |
| Very Low Density Residential | C     | 79  | 0.0             | 0.000             | 0                          |
| Conservation/Open Space      | C     | 79  | 0.5             | 0.001             | 37                         |
| Conservation/Open Space      | D     | 84  | 16.5            | 0.026             | 1389                       |
| <b>Totals =</b>              |       |     | 109.39          | 0.171             | 8792.0                     |

Total (weighted) RCN = total product/total area = 80.38

RCN used = 80

**Subbasin: FSUT1-2F**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 0.5             | 0.001             | 37                         |
| Right-Of-Way                 | B     | 89  | 0.2             | 0.000             | 15                         |
| Right-Of-Way                 | C     | 92  | 0.3             | 0.000             | 24                         |
| Right-Of-Way                 | D     | 93  | 0.1             | 0.000             | 5                          |
| Office/Institutional/Medical | B     | 85  | 0.3             | 0.000             | 23                         |
| Office/Institutional/Medical | C     | 90  | 1.8             | 0.003             | 160                        |
| Office/Institutional/Medical | D     | 92  | 0.6             | 0.001             | 55                         |
| Medium Density Residential   | A     | 54  | 3.8             | 0.006             | 205                        |
| Medium Density Residential   | B     | 70  | 8.4             | 0.013             | 591                        |
| Medium Density Residential   | C     | 80  | 28.0            | 0.044             | 2243                       |
| Medium Density Residential   | D     | 85  | 22.0            | 0.034             | 1871                       |
| Conservation/Open Space      | D     | 84  | 1.8             | 0.003             | 149                        |
| <b>Totals =</b>              |       |     | 67.66           | 0.106             | 5379.3                     |

Total (weighted) RCN = total product/total area = 79.51

RCN used = 80

**Subbasin: FSUT1-2G**

| Landuse                        | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|--------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                | Group |     |                 |                   |                            |
| Right-Of-Way                   | B     | 89  | 1.3             | 0.002             | 115                        |
| Right-Of-Way                   | C     | 92  | 1.5             | 0.002             | 138                        |
| Right-Of-Way                   | D     | 93  | 3.2             | 0.005             | 301                        |
| Mixed Use/Office/Institutional | B     | 85  | 4.8             | 0.008             | 408                        |
| Mixed Use/Office/Institutional | D     | 92  | 5.1             | 0.008             | 465                        |
| Medium Density Residential     | D     | 85  | 0.0             | 0.000             | 0                          |
| Very Low Density Residential   | B     | 69  | 4.7             | 0.007             | 324                        |
| Very Low Density Residential   | C     | 79  | 8.3             | 0.013             | 655                        |
| Very Low Density Residential   | D     | 84  | 29.3            | 0.046             | 2465                       |
| <b>Totals =</b>                |       |     | 58.21           | 0.091             | 4870.4                     |

Total (weighted) RCN = total product/total area = 83.67

RCN used = 84

**Subbasin: FSUT1-3**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 2.3             | 0.004             | 194                        |
| Right-Of-Way                 | B     | 89  | 0.8             | 0.001             | 67                         |
| Right-Of-Way                 | B/D   | 89  | 0.1             | 0.000             | 7                          |
| Right-Of-Way                 | C     | 92  | 0.4             | 0.001             | 34                         |
| Right-Of-Way                 | D     | 93  | 0.6             | 0.001             | 54                         |
| High Density Residential     | B     | 75  | 0.0             | 0.000             | 0                          |
| Medium Density Residential   | A     | 54  | 5.1             | 0.008             | 274                        |
| Medium Density Residential   | B     | 70  | 9.6             | 0.015             | 672                        |
| Medium Density Residential   | B/D   | 70  | 31.0            | 0.048             | 2172                       |
| Medium Density Residential   | C     | 80  | 25.3            | 0.040             | 2026                       |
| Medium Density Residential   | D     | 85  | 2.6             | 0.004             | 223                        |
| Low Density Residential      | D     | 84  | 0.0             | 0.000             | 1                          |
| Very Low Density Residential | A     | 49  | 8.9             | 0.014             | 438                        |
| Very Low Density Residential | B     | 69  | 1.3             | 0.002             | 89                         |
| Very Low Density Residential | B/D   | 69  | 9.9             | 0.016             | 685                        |
| Very Low Density Residential | C     | 79  | 0.1             | 0.000             | 7                          |
| Very Low Density Residential | D     | 84  | 0.5             | 0.001             | 42                         |
| Conservation/Open Space      | B     | 69  | 0.5             | 0.001             | 33                         |
| Conservation/Open Space      | B/D   | 69  | 15.2            | 0.024             | 1048                       |
| Conservation/Open Space      | C     | 79  | 0.3             | 0.000             | 23                         |
| Conservation/Open Space      | D     | 84  | 5.4             | 0.008             | 453                        |
| <b>Totals =</b>              |       |     | 119.87          | 0.187             | 8541.2                     |

**Total (weighted) RCN = total product/total area = 71.26**

**RCN used = 71**

**Subbasin: FSUT2-1**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | A     | 83  | 1.2             | 0.002             | 100                        |
| Right-Of-Way                 | B/D   | 89  | 3.5             | 0.005             | 308                        |
| Right-Of-Way                 | C     | 92  | 9.6             | 0.015             | 880                        |
| Right-Of-Way                 | W     | 93  | 0.1             | 0.000             | 9                          |
| Commercial                   | B/D   | 92  | 1.9             | 0.003             | 170                        |
| Commercial                   | C     | 94  | 8.6             | 0.013             | 806                        |
| Office/Institutional/Medical | B/D   | 85  | 0.9             | 0.001             | 78                         |
| Office/Institutional/Medical | C     | 90  | 0.6             | 0.001             | 56                         |
| Office/Institutional/Medical | W     | 100 | 0.4             | 0.001             | 35                         |
| High Density Residential     | B/D   | 75  | 2.1             | 0.003             | 159                        |
| High Density Residential     | C     | 83  | 0.7             | 0.001             | 57                         |
| Medium Density Residential   | A     | 54  | 6.0             | 0.009             | 321                        |
| Medium Density Residential   | B/D   | 70  | 15.5            | 0.024             | 1087                       |
| Medium Density Residential   | C     | 80  | 36.0            | 0.056             | 2881                       |
| <b>Totals =</b>              |       |     | 86.94           | 0.136             | 6947.3                     |

**Total (weighted) RCN = total product/total area = 79.91**

**RCN used = 80**

**Subbasin: FSUT2-2**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B     | 89  | 0.0             | 0.000             | 1                          |
| Right-Of-Way               | C     | 92  | 0.3             | 0.000             | 27                         |
| Right-Of-Way               | D     | 93  | 1.0             | 0.002             | 90                         |
| High Density Residential   | B     | 75  | 0.0             | 0.000             | 1                          |
| High Density Residential   | B/D   | 75  | 0.2             | 0.000             | 12                         |
| High Density Residential   | C     | 83  | 1.1             | 0.002             | 87                         |
| High Density Residential   | D     | 87  | 2.3             | 0.004             | 200                        |
| Medium Density Residential | B     | 70  | 5.5             | 0.009             | 384                        |
| Medium Density Residential | C     | 80  | 3.9             | 0.006             | 313                        |
| Medium Density Residential | D     | 85  | 5.8             | 0.009             | 492                        |
| <b>Totals =</b>            |       |     | 19.98           | 0.031             | 1607.5                     |

**Total (weighted) RCN = total product/total area = 80.43**

**RCN used = 80**

**Subbasin: FSUT2-3**

| Landuse                      | Soil  | RCN    | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|--------|-----------------|-------------------|----------------------------|
|                              | Group |        |                 |                   |                            |
| Right-Of-Way                 | B     | 89     | 1.5             | 0.002             | 135                        |
| Right-Of-Way                 | B/D   | 89     | 1.9             | 0.003             | 172                        |
| Right-Of-Way                 | C     | 92     | 3.6             | 0.006             | 333                        |
| Right-Of-Way                 | D     | 93     | 0.1             | 0.000             | 6                          |
| Commercial                   | B/D   | 92     | 5.3             | 0.008             | 491                        |
| Commercial                   | C     | 94     | 4.6             | 0.007             | 430                        |
| Commercial                   | D     | 95     | 3.4             | 0.005             | 321                        |
| High Density Residential     | B     | 75     | 4.3             | 0.007             | 324                        |
| High Density Residential     | B/D   | 75     | 0.1             | 0.000             | 5                          |
| High Density Residential     | C     | 83     | 0.1             | 0.000             | 7                          |
| High Density Residential     | D     | 87     | 1.2             | 0.002             | 103                        |
| Medium Density Residential   | B     | 70     | 9.7             | 0.015             | 680                        |
| Medium Density Residential   | B/D   | 70     | 17.0            | 0.027             | 1193                       |
| Medium Density Residential   | C     | 80     | 51.2            | 0.080             | 4092                       |
| Medium Density Residential   | D     | 85     | 3.1             | 0.005             | 261                        |
| Very Low Density Residential | B/D   | 69     | 6.3             | 0.010             | 435                        |
| Very Low Density Residential | C     | 79     | 6.6             | 0.010             | 518                        |
| Very Low Density Residential | D     | 84     | 0.8             | 0.001             | 69                         |
| Conservation/Open Space      | B/D   | 69     | 4.6             | 0.007             | 320                        |
| Conservation/Open Space      | C     | 79     | 12.1            | 0.019             | 957                        |
| <b>Totals =</b>              |       | 137.53 |                 | 0.215             | 10855.2                    |

**Total (weighted) RCN = total product/total area = 78.93**

**RCN used = 79**

**Subbasin: FSUT2-4**

| Landuse                           | Soil  | RCN   | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-------|-----------------|-------------------|----------------------------|
|                                   | Group |       |                 |                   |                            |
| Right-Of-Way                      | B     | 89    | 1.2             | 0.002             | 104                        |
| Right-Of-Way                      | B/D   | 89    | 2.6             | 0.004             | 228                        |
| Right-Of-Way                      | C     | 92    | 5.8             | 0.009             | 530                        |
| Right-Of-Way                      | D     | 93    | 2.2             | 0.003             | 207                        |
| Commercial                        | B     | 92    | 1.5             | 0.002             | 138                        |
| Commercial                        | B/D   | 92    | 13.7            | 0.021             | 1264                       |
| Commercial                        | C     | 94    | 15.6            | 0.024             | 1471                       |
| Commercial                        | D     | 95    | 10.1            | 0.016             | 962                        |
| Office/Institutional/Multi-Family | B/D   | 85    | 0.0             | 0.000             | 1                          |
| Office/Institutional/Multi-Family | C     | 90    | 3.4             | 0.005             | 306                        |
| High Density Residential          | B     | 75    | 2.4             | 0.004             | 180                        |
| High Density Residential          | B/D   | 75    | 16.0            | 0.025             | 1199                       |
| High Density Residential          | C     | 83    | 3.0             | 0.005             | 250                        |
| High Density Residential          | D     | 87    | 9.2             | 0.014             | 800                        |
| Medium Density Residential        | B     | 70    | 0.9             | 0.001             | 62                         |
| Medium Density Residential        | B/D   | 70    | 0.2             | 0.000             | 11                         |
| Medium Density Residential        | C     | 80    | 0.4             | 0.001             | 33                         |
| Very Low Density Residential      | C     | 79    | 0.5             | 0.001             | 42                         |
| <b>Totals =</b>                   |       | 88.72 |                 | 0.139             | 7787.8                     |

**Total (weighted) RCN = total product/total area = 87.78**

**RCN used = 88**



**Subbasin: FSUT2-5**

| Landuse                        | Soil  | RCN | Area    | Area      | Product of   |
|--------------------------------|-------|-----|---------|-----------|--------------|
|                                | Group |     | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                   | B     | 89  | 3.0     | 0.005     | 269          |
| Right-Of-Way                   | B/D   | 89  | 9.5     | 0.015     | 848          |
| Right-Of-Way                   | C     | 92  | 7.1     | 0.011     | 653          |
| Right-Of-Way                   | D     | 93  | 0.2     | 0.000     | 22           |
| Commercial                     | B     | 92  | 10.2    | 0.016     | 943          |
| Commercial                     | B/D   | 92  | 30.8    | 0.048     | 2837         |
| Commercial                     | C     | 84  | 32.6    | 0.051     | 2737         |
| Commercial                     | D     | 95  | 14.8    | 0.023     | 1405         |
| Mixed Use/Office/Institutional | B/D   | 85  | 0.9     | 0.001     | 77           |
| Very Low Density Residential   | B/D   | 69  | 6.9     | 0.011     | 474          |
| Very Low Density Residential   | C     | 79  | 19.6    | 0.031     | 1546         |
| Very Low Density Residential   | D     | 84  | 0.6     | 0.001     | 48           |
| <b>Totals =</b>                |       |     | 136.26  | 0.213     | 11859.2      |

**Total (weighted) RCN = total product/total area = 87.03**

**RCN used = 87**

**Subbasin: FSUT2-6**

| Landuse                           | Soil  | RCN | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group |     | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 7.4     | 0.012     | 660          |
| Right-Of-Way                      | B/D   | 89  | 3.3     | 0.005     | 291          |
| Right-Of-Way                      | C     | 92  | 8.3     | 0.013     | 766          |
| Right-Of-Way                      | D     | 93  | 8.9     | 0.014     | 830          |
| Commercial                        | B     | 92  | 29.8    | 0.047     | 2739         |
| Commercial                        | B/D   | 92  | 6.4     | 0.010     | 590          |
| Commercial                        | C     | 94  | 23.5    | 0.037     | 2209         |
| Commercial                        | D     | 95  | 17.3    | 0.027     | 1647         |
| Commercial                        | W     | 100 | 0.6     | 0.001     | 58           |
| Mixed Use/Office/Institutional    | B     | 95  | 0.5     | 0.001     | 48           |
| Mixed Use/Office/Institutional    | C     | 90  | 1.0     | 0.001     | 86           |
| Mixed Use/Office/Institutional    | D     | 92  | 3.4     | 0.005     | 313          |
| Office/Institutional/Medical      | B     | 95  | 0.1     | 0.000     | 12           |
| Office/Institutional/Medical      | D     | 92  | 0.5     | 0.001     | 50           |
| Office/Institutional/Multi-Family | B     | 85  | 0.2     | 0.000     | 16           |
| Office/Institutional/Multi-Family | C     | 90  | 0.6     | 0.001     | 53           |
| Office/Institutional/Multi-Family | D     | 92  | 1.3     | 0.002     | 124          |
| Low Density Residential           | B     | 68  | 8.0     | 0.013     | 544          |
| Low Density Residential           | B/D   | 68  | 0.3     | 0.000     | 21           |
| Low Density Residential           | C     | 79  | 5.3     | 0.008     | 416          |
| Low Density Residential           | D     | 84  | 19.5    | 0.030     | 1636         |
| Very Low Density Residential      | B     | 69  | 2.5     | 0.004     | 171          |
| Very Low Density Residential      | B/D   | 69  | 2.1     | 0.003     | 144          |
| Very Low Density Residential      | C     | 79  | 24.4    | 0.038     | 1925         |
| Very Low Density Residential      | D     | 84  | 14.3    | 0.022     | 1204         |
| Very Low Density Residential      | W     | 100 | 0.3     | 0.000     | 26           |
| Conservation/Open Space           | B     | 69  | 3.7     | 0.006     | 258          |
| Conservation/Open Space           | B/D   | 69  | 0.0     | 0.000     | 0            |
| Conservation/Open Space           | C     | 79  | 1.9     | 0.003     | 151          |
| Conservation/Open Space           | D     | 84  | 4.5     | 0.007     | 376          |
| <b>Totals =</b>                   |       |     | 199.87  | 0.312     | 17361.3      |

**Total (weighted) RCN = total product/total area = 86.86**

**RCN used = 87**

**Subbasin: FSUT2-7A**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 5.0             | 0.008             | 441                        |
| Right-Of-Way                 | C     | 92  | 6.3             | 0.010             | 582                        |
| Right-Of-Way                 | D     | 93  | 2.4             | 0.004             | 219                        |
| Commercial                   | B/D   | 92  | 0.0             | 0.000             | 1                          |
| Office/Institutional/Medical | C     | 90  | 5.0             | 0.008             | 451                        |
| Office/Institutional/Medical | D     | 92  | 2.2             | 0.003             | 202                        |
| High Density Residential     | B     | 75  | 0.3             | 0.000             | 19                         |
| High Density Residential     | C     | 83  | 4.0             | 0.006             | 328                        |
| High Density Residential     | D     | 87  | 0.9             | 0.001             | 74                         |
| Medium Density Residential   | B     | 70  | 8.9             | 0.014             | 622                        |
| Medium Density Residential   | C     | 80  | 11.6            | 0.018             | 932                        |
| Medium Density Residential   | D     | 85  | 7.2             | 0.011             | 614                        |
| Very Low Density Residential | B     | 69  | 19.2            | 0.030             | 1322                       |
| Very Low Density Residential | B/D   | 69  | 6.7             | 0.011             | 464                        |
| Very Low Density Residential | C     | 79  | 41.3            | 0.064             | 3259                       |
| Very Low Density Residential | D     | 84  | 3.8             | 0.006             | 320                        |
| <b>Totals =</b>              |       |     | 124.59          | 0.195             | 9847.8                     |

Total (weighted) RCN = total product/total area = 79.04

RCN used = 79

**Subbasin: FSUT2-7B**

| Landuse                        | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|--------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                | Group |     |                 |                   |                            |
| Right-Of-Way                   | A     | 83  | 0.7             | 0.001             | 55                         |
| Right-Of-Way                   | B     | 89  | 13.1            | 0.020             | 1167                       |
| Right-Of-Way                   | B/D   | 89  | 5.8             | 0.009             | 515                        |
| Right-Of-Way                   | C     | 92  | 8.1             | 0.013             | 743                        |
| Right-Of-Way                   | C/D   | 92  | 0.3             | 0.000             | 29                         |
| Right-Of-Way                   | D     | 93  | 2.1             | 0.003             | 194                        |
| Right-Of-Way                   | W     | 100 | 0.0             | 0.000             | 4                          |
| Commercial                     | B     | 92  | 6.5             | 0.010             | 600                        |
| Commercial                     | B/D   | 92  | 6.0             | 0.009             | 554                        |
| Commercial                     | C     | 94  | 8.5             | 0.013             | 799                        |
| Commercial                     | C/D   | 94  | 2.1             | 0.003             | 201                        |
| Commercial                     | D     | 95  | 0.2             | 0.000             | 20                         |
| Mixed Use/Office/Institutional | B     | 85  | 2.9             | 0.005             | 248                        |
| Mixed Use/Office/Institutional | B/D   | 85  | 0.2             | 0.000             | 13                         |
| Mixed Use/Office/Institutional | C     | 90  | 2.9             | 0.005             | 262                        |
| Office/Institutional/Medical   | B/D   | 85  | 1.3             | 0.002             | 112                        |
| Office/Institutional/Medical   | C     | 90  | 0.6             | 0.001             | 50                         |
| High Density Residential       | A     | 61  | 1.5             | 0.002             | 92                         |
| High Density Residential       | B     | 75  | 6.7             | 0.011             | 505                        |
| High Density Residential       | B/D   | 75  | 8.6             | 0.013             | 645                        |
| High Density Residential       | C     | 83  | 2.9             | 0.005             | 241                        |
| High Density Residential       | C/D   | 83  | 0.2             | 0.000             | 15                         |
| High Density Residential       | W     | 100 | 0.2             | 0.000             | 18                         |
| Medium Density Residential     | B     | 70  | 13.8            | 0.022             | 965                        |
| Medium Density Residential     | B/D   | 70  | 2.9             | 0.005             | 204                        |
| Medium Density Residential     | C     | 80  | 5.3             | 0.008             | 425                        |
| Medium Density Residential     | D     | 85  | 6.0             | 0.009             | 507                        |
| Low Density Residential        | A     | 51  | 8.1             | 0.013             | 411                        |
| Low Density Residential        | B     | 68  | 27.3            | 0.043             | 1854                       |
| Low Density Residential        | B/D   | 68  | 19.1            | 0.030             | 1296                       |
| Low Density Residential        | C     | 79  | 29.7            | 0.046             | 2343                       |
| Low Density Residential        | C/D   | 79  | 2.1             | 0.003             | 170                        |
| Low Density Residential        | D     | 84  | 12.6            | 0.020             | 1057                       |
| Very Low Density Residential   | B     | 69  | 22.8            | 0.036             | 1576                       |
| Very Low Density Residential   | B/D   | 69  | 6.0             | 0.009             | 414                        |
| Very Low Density Residential   | C     | 79  | 11.1            | 0.017             | 875                        |
| Very Low Density Residential   | C/D   | 79  | 1.0             | 0.002             | 80                         |
| Very Low Density Residential   | D     | 84  | 20.0            | 0.031             | 1679                       |
| <b>Totals =</b>                |       |     | 269.12          | 0.420             | 20939.2                    |

Total (weighted) RCN = total product/total area = 77.81

RCN used = 78

**Subbasin: FSUT2-8A**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 10.4            | 0.016             | 929                        |
| Right-Of-Way                 | B/D   | 89  | 2.7             | 0.004             | 236                        |
| Right-Of-Way                 | C     | 92  | 11.6            | 0.018             | 1064                       |
| Right-Of-Way                 | D     | 93  | 5.4             | 0.008             | 500                        |
| Commercial                   | B     | 92  | 0.9             | 0.001             | 82                         |
| High Density Residential     | B     | 75  | 0.2             | 0.000             | 14                         |
| High Density Residential     | C     | 83  | 8.4             | 0.013             | 697                        |
| Medium Density Residential   | B     | 70  | 20.8            | 0.032             | 1453                       |
| Medium Density Residential   | B/D   | 70  | 9.8             | 0.015             | 685                        |
| Medium Density Residential   | C     | 80  | 39.8            | 0.062             | 3181                       |
| Medium Density Residential   | D     | 85  | 25.2            | 0.039             | 2138                       |
| Medium Density Residential   | W     | 100 | 0.3             | 0.001             | 33                         |
| Low Density Residential      | B     | 68  | 5.3             | 0.008             | 359                        |
| Low Density Residential      | C     | 79  | 1.2             | 0.002             | 97                         |
| Low Density Residential      | D     | 84  | 6.0             | 0.009             | 508                        |
| Very Low Density Residential | B     | 69  | 11.9            | 0.019             | 822                        |
| Very Low Density Residential | B/D   | 69  | 3.8             | 0.006             | 264                        |
| Very Low Density Residential | C     | 79  | 1.8             | 0.003             | 143                        |
| Very Low Density Residential | D     | 84  | 8.1             | 0.013             | 677                        |
| <b>Totals =</b>              |       |     | 173.50          | 0.271             | 13885.2                    |

Total (weighted) RCN = total product/total area = 80.03

RCN used = 80

**Subbasin: FSUT2-8B**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B     | 89  | 2.6             | 0.004             | 228                        |
| Right-Of-Way                      | B/D   | 89  | 0.1             | 0.000             | 8                          |
| Right-Of-Way                      | C     | 92  | 3.3             | 0.005             | 308                        |
| Right-Of-Way                      | C/D   | 92  | 0.8             | 0.001             | 73                         |
| Right-Of-Way                      | D     | 93  | 0.0             | 0.000             | 1                          |
| Commercial                        | B     | 92  | 0.2             | 0.000             | 18                         |
| Commercial                        | B/D   | 92  | 0.2             | 0.000             | 20                         |
| Commercial                        | C     | 94  | 4.6             | 0.007             | 435                        |
| Commercial                        | C/D   | 94  | 0.0             | 0.000             | 5                          |
| Office/Institutional/Medical      | B/D   | 85  | 0.7             | 0.001             | 61                         |
| Office/Institutional/Medical      | C     | 90  | 0.4             | 0.001             | 32                         |
| Office/Institutional/Multi-Family | B     | 85  | 0.0             | 0.000             | 3                          |
| Office/Institutional/Multi-Family | C     | 90  | 0.1             | 0.000             | 12                         |
| High Density Residential          | B     | 75  | 1.7             | 0.003             | 124                        |
| High Density Residential          | B/D   | 75  | 0.9             | 0.001             | 68                         |
| High Density Residential          | C     | 83  | 3.0             | 0.005             | 251                        |
| High Density Residential          | C/D   | 83  | 1.1             | 0.002             | 92                         |
| Medium Density Residential        | B     | 70  | 2.7             | 0.004             | 191                        |
| Medium Density Residential        | C     | 80  | 1.1             | 0.002             | 87                         |
| Low Density Residential           | B     | 68  | 0.2             | 0.000             | 14                         |
| Low Density Residential           | C/D   | 79  | 0.0             | 0.000             | 2                          |
| Very Low Density Residential      | B     | 69  | 4.2             | 0.007             | 289                        |
| Very Low Density Residential      | B/D   | 69  | 0.3             | 0.001             | 23                         |
| Very Low Density Residential      | C     | 79  | 4.5             | 0.007             | 352                        |
| Very Low Density Residential      | C/D   | 79  | 3.1             | 0.005             | 245                        |
| Very Low Density Residential      | D     | 84  | 0.7             | 0.001             | 57                         |
| <b>Totals =</b>                   |       |     | 36.66           | 0.057             | 3000.8                     |

Total (weighted) RCN = total product/total area = 81.86

RCN used = 82

**Subbasin: FSUT2-9A**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 6.0             | 0.009             | 537                        |
| Right-Of-Way                 | B/D   | 89  | 2.9             | 0.004             | 254                        |
| Right-Of-Way                 | C     | 92  | 2.3             | 0.004             | 209                        |
| Right-Of-Way                 | D     | 93  | 3.0             | 0.005             | 278                        |
| Medium Density Residential   | B     | 70  | 19.2            | 0.030             | 1347                       |
| Medium Density Residential   | B/D   | 70  | 9.6             | 0.015             | 672                        |
| Medium Density Residential   | C     | 80  | 8.9             | 0.014             | 709                        |
| Medium Density Residential   | D     | 85  | 9.8             | 0.015             | 831                        |
| Very Low Density Residential | B     | 69  | 1.0             | 0.002             | 69                         |
| Very Low Density Residential | C     | 79  | 0.0             | 0.000             | 2                          |
| <b>Totals =</b>              |       |     | 62.66           | 0.098             | 4908.3                     |

**Total (weighted) RCN = total product/total area = 78.33**

**RCN used = 78**

**Subbasin: FSUT2-9B**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 1.0             | 0.002             | 87                         |
| Right-Of-Way                 | B/D   | 89  | 1.7             | 0.003             | 154                        |
| Right-Of-Way                 | C     | 92  | 1.6             | 0.002             | 146                        |
| Right-Of-Way                 | C/D   | 92  | 0.1             | 0.000             | 5                          |
| Medium Density Residential   | A     | 54  | 0.2             | 0.000             | 11                         |
| Medium Density Residential   | B     | 70  | 1.3             | 0.002             | 93                         |
| Medium Density Residential   | B/D   | 70  | 4.4             | 0.007             | 310                        |
| Medium Density Residential   | C     | 80  | 0.6             | 0.001             | 52                         |
| Medium Density Residential   | D     | 85  | 10.4            | 0.016             | 880                        |
| Very Low Density Residential | A     | 49  | 0.1             | 0.000             | 6                          |
| Very Low Density Residential | B     | 69  | 3.2             | 0.005             | 224                        |
| Very Low Density Residential | B/D   | 69  | 14.5            | 0.023             | 998                        |
| Very Low Density Residential | C     | 79  | 12.3            | 0.019             | 968                        |
| Very Low Density Residential | C/D   | 79  | 0.4             | 0.001             | 29                         |
| Very Low Density Residential | D     | 84  | 16.6            | 0.026             | 1394                       |
| Conservation/Open Space      | B/D   | 69  | 0.4             | 0.001             | 29                         |
| Conservation/Open Space      | D     | 84  | 2.8             | 0.004             | 238                        |
| <b>Totals =</b>              |       |     | 71.63           | 0.112             | 5624.8                     |

**Total (weighted) RCN = total product/total area = 78.53**

**RCN used = 79**

**Subbasin: FSUT3-1A**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A     | 83  | 0.1             | 0.000             | 9                          |
| Right-Of-Way                      | C     | 92  | 2.8             | 0.004             | 258                        |
| Right-Of-Way                      | D     | 93  | 7.0             | 0.011             | 649                        |
| Commercial                        | A     | 89  | 1.7             | 0.003             | 152                        |
| Commercial                        | C     | 94  | 7.5             | 0.012             | 709                        |
| Commercial                        | D     | 95  | 0.2             | 0.000             | 17                         |
| Office/Institutional/Multi-Family | A     | 77  | 0.4             | 0.001             | 32                         |
| Office/Institutional/Multi-Family | C     | 90  | 0.4             | 0.001             | 39                         |
| Office/Institutional/Multi-Family | D     | 92  | 0.6             | 0.001             | 54                         |
| Low Density Residential           | A     | 51  | 0.3             | 0.000             | 15                         |
| Low Density Residential           | C     | 79  | 9.7             | 0.015             | 769                        |
| Low Density Residential           | D     | 84  | 36.1            | 0.056             | 3035                       |
| <b>Totals =</b>                   |       |     | 66.91           | 0.105             | 5737.8                     |

**Total (weighted) RCN = total product/total area = 85.75**

**RCN used = 86**

**Subbasin: FSUT3-1B**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B/D   | 89  | 6.6             | 0.010             | 583                        |
| Right-Of-Way                 | D     | 93  | 6.8             | 0.011             | 631                        |
| Office/Institutional/Medical | C     | 90  | 0.0             | 0.000             | 1                          |
| Low Density Residential      | B/D   | 68  | 26.0            | 0.041             | 1767                       |
| Low Density Residential      | D     | 84  | 21.4            | 0.033             | 1794                       |
| Conservation/Open Space      | D     | 84  | 0.1             | 0.000             | 11                         |
| <b>Totals =</b>              |       |     | 60.83           | 0.095             | 4787.7                     |

Total (weighted) RCN = total product/total area = 78.71

RCN used = 79

**Subbasin: FSUT3-1C**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B/D   | 89  | 9.5             | 0.015             | 842                        |
| Right-Of-Way                      | C     | 92  | 0.0             | 0.000             | 0                          |
| Right-Of-Way                      | D     | 93  | 0.0             | 0.000             | 3                          |
| Office/Institutional/Medical      | D     | 92  | 0.0             | 0.000             | 0                          |
| Office/Institutional/Multi-Family | C     | 90  | 1.0             | 0.002             | 87                         |
| Medium Density Residential        | B/D   | 70  | 0.0             | 0.000             | 0                          |
| Low Density Residential           | B/D   | 68  | 42.6            | 0.067             | 2894                       |
| Low Density Residential           | C     | 79  | 1.0             | 0.002             | 81                         |
| Low Density Residential           | D     | 84  | 0.1             | 0.000             | 8                          |
| Conservation/Open Space           | B/D   | 69  | 1.1             | 0.002             | 79                         |
| Conservation/Open Space           | C     | 79  | 2.7             | 0.004             | 215                        |
| <b>Totals =</b>                   |       |     | 58.01           | 0.091             | 4209.6                     |

Total (weighted) RCN = total product/total area = 72.56

RCN used = 73

**Subbasin: FSUT3-1D**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | A     | 83  | 0.3             | 0.000             | 24                         |
| Right-Of-Way                      | B/D   | 89  | 2.3             | 0.004             | 209                        |
| Right-Of-Way                      | C     | 92  | 4.5             | 0.007             | 415                        |
| Right-Of-Way                      | D     | 93  | 4.8             | 0.008             | 448                        |
| Commercial                        | A     | 89  | 0.8             | 0.001             | 74                         |
| Commercial                        | C     | 94  | 11.9            | 0.019             | 1118                       |
| Commercial                        | D     | 95  | 0.1             | 0.000             | 11                         |
| Office/Institutional/Multi-Family | B/D   | 85  | 0.4             | 0.001             | 36                         |
| Office/Institutional/Multi-Family | C     | 90  | 14.2            | 0.022             | 1275                       |
| Office/Institutional/Multi-Family | D     | 92  | 4.4             | 0.007             | 407                        |
| High Density Residential          | B/D   | 75  | 0.0             | 0.000             | 0                          |
| High Density Residential          | C     | 83  | 2.8             | 0.004             | 232                        |
| High Density Residential          | D     | 87  | 3.8             | 0.006             | 328                        |
| Medium Density Residential        | B/D   | 70  | 25.7            | 0.040             | 1798                       |
| Medium Density Residential        | C     | 80  | 5.4             | 0.008             | 434                        |
| Medium Density Residential        | D     | 85  | 5.9             | 0.009             | 498                        |
| Low Density Residential           | C     | 79  | 0.2             | 0.000             | 14                         |
| Low Density Residential           | D     | 84  | 17.9            | 0.028             | 1501                       |
| <b>Totals =</b>                   |       |     | 105.41          | 0.165             | 8823.1                     |

Total (weighted) RCN = total product/total area = 83.70

RCN used = 84

**Subbasin: FSUT3-1E**

| Landuse                    | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|----------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                            | Group |     |                 |                   |                            |
| Right-Of-Way               | B/D   | 89  | 3.2             | 0.005             | 286                        |
| Right-Of-Way               | D     | 93  | 0.5             | 0.001             | 44                         |
| Medium Density Residential | B/D   | 70  | 12.3            | 0.019             | 858                        |
| Medium Density Residential | D     | 85  | 0.3             | 0.000             | 22                         |
| Low Density Residential    | B/D   | 68  | 6.6             | 0.010             | 446                        |
| Low Density Residential    | D     | 84  | 1.4             | 0.002             | 119                        |
| Conservation/Open Space    | B/D   | 69  | 0.1             | 0.000             | 4                          |
| <b>Totals =</b>            |       |     | 24.25           | 0.038             | 1779.8                     |

Total (weighted) RCN = total product/total area = 73.40

RCN used = 73

**Subbasin: FSUT3-2A**

| Landuse                           | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                                   | Group |     |                 |                   |                            |
| Right-Of-Way                      | B/D   | 89  | 1.1             | 0.002             | 94                         |
| Office/Institutional/Multi-Family | C     | 90  | 0.0             | 0.000             | 0                          |
| High Density Residential          | B/D   | 75  | 0.4             | 0.001             | 28                         |
| Medium Density Residential        | B/D   | 70  | 44.1            | 0.069             | 3090                       |
| Medium Density Residential        | C     | 80  | 7.9             | 0.012             | 633                        |
| <b>Totals =</b>                   |       |     | 53.49           | 0.084             | 3845.6                     |

Total (weighted) RCN = total product/total area = 71.89

RCN used = 72

**Subbasin: FSUT3-2B**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B/D   | 89  | 4.3             | 0.007             | 380                        |
| Right-Of-Way                 | C     | 92  | 0.7             | 0.001             | 66                         |
| Medium Density Residential   | B/D   | 70  | 9.5             | 0.015             | 667                        |
| Medium Density Residential   | C     | 80  | 8.2             | 0.013             | 660                        |
| Low Density Residential      | B/D   | 68  | 7.5             | 0.012             | 507                        |
| Low Density Residential      | C     | 79  | 3.3             | 0.005             | 263                        |
| Very Low Density Residential | B/D   | 69  | 27.3            | 0.043             | 1881                       |
| Very Low Density Residential | C     | 79  | 4.3             | 0.007             | 336                        |
| Conservation/Open Space      | B/D   | 69  | 4.4             | 0.007             | 303                        |
| Conservation/Open Space      | C     | 84  | 1.8             | 0.003             | 149                        |
| <b>Totals =</b>              |       |     | 71.22           | 0.111             | 5211.2                     |

Total (weighted) RCN = total product/total area = 73.17

RCN used = 73

**Subbasin: FSUT3-3**

| Landuse                      | Soil  | RCN | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|------------------------------|-------|-----|-----------------|-------------------|----------------------------|
|                              | Group |     |                 |                   |                            |
| Right-Of-Way                 | B     | 89  | 0.3             | 0.000             | 26                         |
| Right-Of-Way                 | B/D   | 89  | 2.8             | 0.004             | 254                        |
| Right-Of-Way                 | C     | 92  | 5.0             | 0.008             | 457                        |
| High Density Residential     | B/D   | 75  | 3.9             | 0.006             | 289                        |
| High Density Residential     | C     | 83  | 6.7             | 0.011             | 558                        |
| Medium Density Residential   | B/D   | 70  | 2.9             | 0.004             | 200                        |
| Medium Density Residential   | C     | 80  | 4.2             | 0.007             | 336                        |
| Low Density Residential      | B/D   | 68  | 1.9             | 0.003             | 129                        |
| Low Density Residential      | C     | 79  | 1.6             | 0.003             | 130                        |
| Very Low Density Residential | B     | 69  | 1.5             | 0.002             | 106                        |
| Very Low Density Residential | B/D   | 69  | 11.8            | 0.018             | 815                        |
| Very Low Density Residential | C     | 84  | 15.5            | 0.024             | 1303                       |
| Conservation/Open Space      | C     | 79  | 0.1             | 0.000             | 5                          |
| <b>Totals =</b>              |       |     | 58.22           | 0.091             | 4608.3                     |

Total (weighted) RCN = total product/total area = 79.16

RCN used = 79

**Subbasin: FSUT3-4A**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B/D   | 89  | 1.9     | 0.003     | 171          |
| Commercial                        | B/D   | 92  | 1.3     | 0.002     | 118          |
| Office/Institutional/Multi-Family | B/D   | 85  | 16.6    | 0.026     | 1407         |
| Office/Institutional/Multi-Family | C     | 90  | 3.5     | 0.005     | 314          |
| High Density Residential          | B/D   | 75  | 11.7    | 0.018     | 875          |
| High Density Residential          | C     | 83  | 1.8     | 0.003     | 147          |
| Medium Density Residential        | B/D   | 70  | 0.1     | 0.000     | 9            |
| Medium Density Residential        | C     | 80  | 6.0     | 0.009     | 483          |
| <b>Totals =</b>                   |       |     | 42.85   | 0.067     | 3523.9       |

Total (weighted) RCN = total product/total area = 82.24

RCN used = 82

**Subbasin: FSUT3-4B**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B/D   | 89  | 1.1     | 0.002     | 98           |
| Right-Of-Way                      | C     | 92  | 0.1     | 0.000     | 6            |
| Right-Of-Way                      | D     | 93  | 0.2     | 0.000     | 14           |
| Commercial                        | B/D   | 92  | 1.3     | 0.002     | 123          |
| Commercial                        | C     | 94  | 16.3    | 0.026     | 1536         |
| Commercial                        | D     | 95  | 0.1     | 0.000     | 7            |
| Office/Institutional/Medical      | B/D   | 85  | 0.0     | 0.000     | 1            |
| Office/Institutional/Medical      | C     | 90  | 0.3     | 0.000     | 24           |
| Office/Institutional/Multi-Family | B/D   | 85  | 9.3     | 0.015     | 794          |
| Office/Institutional/Multi-Family | C     | 90  | 5.0     | 0.008     | 452          |
| Office/Institutional/Multi-Family | D     | 92  | 0.3     | 0.001     | 31           |
| High Density Residential          | B/D   | 75  | 5.8     | 0.009     | 435          |
| High Density Residential          | C     | 83  | 2.4     | 0.004     | 198          |
| Very Low Density Residential      | B/D   | 69  | 0.8     | 0.001     | 55           |
| Very Low Density Residential      | C     | 79  | 0.3     | 0.000     | 20           |
| <b>Totals =</b>                   |       |     | 43.28   | 0.068     | 3793.7       |

Total (weighted) RCN = total product/total area = 87.66

RCN used = 88

**Subbasin: FSUT3-4C**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 0.3     | 0.000     | 23           |
| Right-Of-Way                      | B/D   | 89  | 10.7    | 0.017     | 953          |
| Right-Of-Way                      | C     | 92  | 1.5     | 0.002     | 135          |
| Commercial                        | B/D   | 92  | 6.5     | 0.010     | 600          |
| Commercial                        | C     | 94  | 3.0     | 0.005     | 278          |
| Office/Institutional/Medical      | B/D   | 85  | 1.2     | 0.002     | 99           |
| Office/Institutional/Medical      | C     | 90  | 0.0     | 0.000     | 0            |
| Office/Institutional/Multi-Family | B/D   | 85  | 20.1    | 0.031     | 1708         |
| Office/Institutional/Multi-Family | C     | 90  | 5.7     | 0.009     | 510          |
| High Density Residential          | B     | 75  | 1.2     | 0.002     | 91           |
| High Density Residential          | B/D   | 75  | 20.6    | 0.032     | 1545         |
| High Density Residential          | C     | 83  | 4.0     | 0.006     | 330          |
| Medium Density Residential        | B/D   | 70  | 3.8     | 0.006     | 268          |
| Medium Density Residential        | C     | 80  | 5.7     | 0.009     | 460          |
| <b>Totals =</b>                   |       |     | 84.21   | 0.132     | 7000.1       |

Total (weighted) RCN = total product/total area = 83.13

RCN used = 83

**Subbasin: FSUT3-4D**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 0.4     | 0.001     | 37           |
| Right-Of-Way                      | B/D   | 89  | 1.0     | 0.002     | 88           |
| Right-Of-Way                      | C     | 92  | 0.4     | 0.001     | 34           |
| Commercial                        | B/D   | 92  | 10.3    | 0.016     | 943          |
| Commercial                        | C     | 94  | 2.2     | 0.003     | 204          |
| Commercial                        | D     | 95  | 2.4     | 0.004     | 231          |
| Office/Institutional/Multi-Family | B/D   | 85  | 11.9    | 0.019     | 1009         |
| High Density Residential          | B     | 75  | 5.5     | 0.009     | 412          |
| High Density Residential          | B/D   | 75  | 5.0     | 0.008     | 374          |
| High Density Residential          | C     | 83  | 11.6    | 0.018     | 960          |
| High Density Residential          | D     | 87  | 3.4     | 0.005     | 297          |
| <b>Totals =</b>                   |       |     | 53.96   | 0.084     | 4589.4       |

**Total (weighted) RCN = total product/total area = 85.05**

**RCN used = 85**

**Subbasin: FSUT3-5**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 2.6     | 0.004     | 233          |
| Right-Of-Way                      | B/D   | 89  | 5.5     | 0.009     | 493          |
| Right-Of-Way                      | C     | 92  | 3.8     | 0.006     | 350          |
| Industrial                        | A     | 81  | 0.3     | 0.000     | 23           |
| Industrial                        | A/D   | 81  | 0.6     | 0.001     | 51           |
| Industrial                        | B     | 88  | 0.3     | 0.000     | 28           |
| Industrial                        | B/D   | 88  | 0.9     | 0.001     | 80           |
| Industrial                        | C     | 91  | 0.0     | 0.000     | 0            |
| Commercial                        | B     | 92  | 2.7     | 0.004     | 252          |
| Commercial                        | B/D   | 92  | 34.1    | 0.053     | 3135         |
| Commercial                        | C     | 94  | 8.9     | 0.014     | 838          |
| Commercial                        | D     | 95  | 1.2     | 0.002     | 110          |
| Office/Institutional/Medical      | B/D   | 85  | 0.1     | 0.000     | 8            |
| Office/Institutional/Medical      | C     | 90  | 3.0     | 0.005     | 269          |
| Office/Institutional/Multi-Family | A     | 77  | 1.7     | 0.003     | 131          |
| Office/Institutional/Multi-Family | B     | 85  | 0.2     | 0.000     | 18           |
| Office/Institutional/Multi-Family | B/D   | 85  | 4.0     | 0.006     | 337          |
| Office/Institutional/Multi-Family | C     | 90  | 8.4     | 0.013     | 757          |
| Office/Institutional/Multi-Family | D     | 92  | 0.3     | 0.000     | 26           |
| High Density Residential          | B/D   | 75  | 0.5     | 0.001     | 37           |
| High Density Residential          | C     | 83  | 0.1     | 0.000     | 10           |
| Very Low Density Residential      | A/D   | 49  | 0.0     | 0.000     | 1            |
| Very Low Density Residential      | B     | 69  | 1.3     | 0.002     | 91           |
| Very Low Density Residential      | B/D   | 69  | 12.7    | 0.020     | 873          |
| Very Low Density Residential      | C     | 79  | 7.5     | 0.012     | 595          |
| <b>Totals =</b>                   |       |     | 100.80  | 0.158     | 8747.7       |

**Total (weighted) RCN = total product/total area = 86.78**

**RCN used = 87**



**Subbasin: FSUT3-6**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 0.4     | 0.001     | 31           |
| Right-Of-Way                      | B/D   | 89  | 5.9     | 0.009     | 521          |
| Right-Of-Way                      | C     | 92  | 2.6     | 0.004     | 235          |
| Right-Of-Way                      | D     | 93  | 0.0     | 0.000     | 0            |
| Commercial                        | B/D   | 92  | 27.7    | 0.043     | 2548         |
| Commercial                        | C     | 94  | 7.5     | 0.012     | 705          |
| Commercial                        | D     | 95  | 0.2     | 0.000     | 15           |
| Office/Institutional/Medical      | C     | 90  | 0.0     | 0.000     | 0            |
| Office/Institutional/Medical      | D     | 92  | 0.5     | 0.001     | 44           |
| Office/Institutional/Multi-Family | B     | 85  | 1.0     | 0.002     | 89           |
| Office/Institutional/Multi-Family | B/D   | 85  | 13.7    | 0.021     | 1161         |
| Office/Institutional/Multi-Family | C     | 90  | 3.2     | 0.005     | 284          |
| Office/Institutional/Multi-Family | D     | 92  | 3.0     | 0.005     | 272          |
| Very Low Density Residential      | B     | 69  | 2.1     | 0.003     | 144          |
| Very Low Density Residential      | B/D   | 69  | 0.8     | 0.001     | 55           |
| Very Low Density Residential      | C     | 79  | 0.5     | 0.001     | 41           |
| Very Low Density Residential      | D     | 84  | 1.1     | 0.002     | 89           |
| <b>Totals =</b>                   |       |     | 69.87   | 0.109     | 6233.9       |

Total (weighted) RCN = total product/total area = 89.22

RCN used = 89

**Subbasin: FSUT3-7**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 0.7     | 0.001     | 64           |
| Right-Of-Way                      | B/D   | 89  | 2.8     | 0.004     | 249          |
| Right-Of-Way                      | C     | 92  | 6.7     | 0.010     | 615          |
| Right-Of-Way                      | D     | 93  | 1.6     | 0.003     | 152          |
| Industrial                        | C     | 91  | 0.1     | 0.000     | 6            |
| Commercial                        | B/D   | 92  | 1.2     | 0.002     | 108          |
| Commercial                        | C     | 94  | 0.6     | 0.001     | 52           |
| Commercial                        | D     | 95  | 0.5     | 0.001     | 50           |
| Mixed Use/Office/Institutional    | B/D   | 85  | 1.3     | 0.002     | 111          |
| Mixed Use/Office/Institutional    | C     | 90  | 0.0     | 0.000     | 0            |
| Mixed Use/Office/Institutional    | D     | 92  | 1.2     | 0.002     | 112          |
| Office/Institutional/Medical      | B/D   | 85  | 1.0     | 0.002     | 84           |
| Office/Institutional/Medical      | C     | 90  | 1.2     | 0.002     | 104          |
| Office/Institutional/Medical      | D     | 92  | 0.5     | 0.001     | 49           |
| Office/Institutional/Multi-Family | B     | 85  | 0.5     | 0.001     | 41           |
| Office/Institutional/Multi-Family | B/D   | 85  | 5.1     | 0.008     | 434          |
| Office/Institutional/Multi-Family | C     | 90  | 15.8    | 0.025     | 1425         |
| Office/Institutional/Multi-Family | D     | 92  | 4.7     | 0.007     | 437          |
| High Density Residential          | B     | 75  | 2.7     | 0.004     | 206          |
| High Density Residential          | B/D   | 75  | 25.0    | 0.039     | 1872         |
| High Density Residential          | C     | 83  | 10.0    | 0.016     | 832          |
| High Density Residential          | D     | 87  | 2.1     | 0.003     | 181          |
| High Density Residential          | W     | 100 | 0.3     | 0.000     | 26           |
| Medium Density Residential        | B/D   | 70  | 1.9     | 0.003     | 130          |
| Medium Density Residential        | C     | 80  | 0.8     | 0.001     | 66           |
| Very Low Density Residential      | B     | 69  | 1.3     | 0.002     | 89           |
| Very Low Density Residential      | C     | 79  | 1.3     | 0.002     | 101          |
| <b>Totals =</b>                   |       |     | 90.82   | 0.142     | 7593.8       |

Total (weighted) RCN = total product/total area = 83.61

RCN used = 84

**Subbasin: FSUT3-8**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A/D   | 83  | 1.1     | 0.002     | 89           |
| Right-Of-Way                      | B     | 89  | 2.4     | 0.004     | 211          |
| Right-Of-Way                      | B/D   | 89  | 2.1     | 0.003     | 188          |
| Right-Of-Way                      | C     | 92  | 0.2     | 0.000     | 16           |
| Right-Of-Way                      | W     | 100 | 0.1     | 0.000     | 13           |
| Commercial                        | B/D   | 92  | 0.5     | 0.001     | 49           |
| Commercial                        | C     | 94  | 0.4     | 0.001     | 38           |
| Office/Institutional/Medical      | B/D   | 85  | 0.6     | 0.001     | 52           |
| Office/Institutional/Multi-Family | B/D   | 85  | 2.6     | 0.004     | 223          |
| Office/Institutional/Multi-Family | C     | 90  | 6.0     | 0.009     | 541          |
| High Density Residential          | A/D   | 61  | 4.2     | 0.007     | 257          |
| High Density Residential          | B     | 75  | 4.4     | 0.007     | 332          |
| High Density Residential          | B/D   | 75  | 12.5    | 0.019     | 935          |
| High Density Residential          | C     | 83  | 0.2     | 0.000     | 13           |
| High Density Residential          | W     | 100 | 0.1     | 0.000     | 12           |
| Medium Density Residential        | B     | 70  | 0.1     | 0.000     | 6            |
| Medium Density Residential        | B/D   | 70  | 0.2     | 0.000     | 11           |
| Very Low Density Residential      | A/D   | 49  | 0.6     | 0.001     | 28           |
| Very Low Density Residential      | B     | 69  | 8.6     | 0.013     | 592          |
| Very Low Density Residential      | B/D   | 69  | 0.0     | 0.000     | 3            |
| Very Low Density Residential      | C     | 79  | 3.1     | 0.005     | 242          |
| <b>Totals =</b>                   |       |     | 49.94   | 0.078     | 3852.3       |

Total (weighted) RCN = total product/total area = 77.14

RCN used = 77

**Subbasin: FSUT3-9A**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A     | 83  | 0.4     | 0.001     | 33           |
| Right-Of-Way                      | A/D   | 83  | 0.3     | 0.000     | 26           |
| Right-Of-Way                      | B     | 89  | 0.5     | 0.001     | 46           |
| Right-Of-Way                      | C     | 92  | 2.4     | 0.004     | 216          |
| Right-Of-Way                      | D     | 93  | 0.4     | 0.001     | 38           |
| Industrial                        | A     | 81  | 0.4     | 0.001     | 29           |
| Industrial                        | A/D   | 81  | 1.1     | 0.002     | 92           |
| Industrial                        | B     | 88  | 0.1     | 0.000     | 11           |
| Industrial                        | B/D   | 88  | 0.4     | 0.001     | 37           |
| Industrial                        | C     | 91  | 2.1     | 0.003     | 192          |
| Commercial                        | C     | 94  | 0.3     | 0.000     | 28           |
| Office/Institutional/Multi-Family | A/D   | 77  | 0.7     | 0.001     | 52           |
| Office/Institutional/Multi-Family | B/D   | 85  | 0.2     | 0.000     | 15           |
| Office/Institutional/Multi-Family | C     | 90  | 9.4     | 0.015     | 849          |
| Office/Institutional/Multi-Family | D     | 92  | 1.6     | 0.002     | 144          |
| High Density Residential          | A     | 61  | 0.1     | 0.000     | 9            |
| High Density Residential          | A/D   | 61  | 2.2     | 0.003     | 133          |
| High Density Residential          | B     | 75  | 0.9     | 0.001     | 67           |
| High Density Residential          | B/D   | 75  | 1.6     | 0.002     | 119          |
| High Density Residential          | C     | 83  | 6.9     | 0.011     | 573          |
| High Density Residential          | D     | 87  | 0.2     | 0.000     | 14           |
| Very Low Density Residential      | B     | 69  | 0.1     | 0.000     | 4            |
| Very Low Density Residential      | B/D   | 69  | 0.0     | 0.000     | 2            |
| Very Low Density Residential      | C     | 79  | 1.3     | 0.002     | 99           |
| <b>Totals =</b>                   |       |     | 33.48   | 0.052     | 2826.8       |

Total (weighted) RCN = total product/total area = 84.44

RCN used = 84

**Subbasin: FSUT3-9B**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A     | 83  | 0.4     | 0.001     | 31           |
| Right-Of-Way                      | A/D   | 83  | 0.7     | 0.001     | 59           |
| Right-Of-Way                      | B     | 89  | 2.1     | 0.003     | 191          |
| Right-Of-Way                      | B/D   | 89  | 2.2     | 0.003     | 196          |
| Right-Of-Way                      | C     | 92  | 6.1     | 0.009     | 557          |
| Right-Of-Way                      | D     | 93  | 0.5     | 0.001     | 51           |
| Industrial                        | A     | 81  | 1.2     | 0.002     | 94           |
| Industrial                        | A/D   | 81  | 1.5     | 0.002     | 121          |
| Industrial                        | B     | 88  | 0.6     | 0.001     | 56           |
| Industrial                        | B/D   | 88  | 1.1     | 0.002     | 100          |
| Industrial                        | C     | 91  | 7.7     | 0.012     | 705          |
| Industrial                        | D     | 93  | 0.7     | 0.001     | 69           |
| Commercial                        | C     | 94  | 0.3     | 0.000     | 25           |
| Office/Institutional/Multi-Family | A/D   | 77  | 1.2     | 0.002     | 94           |
| Office/Institutional/Multi-Family | B     | 85  | 1.4     | 0.002     | 120          |
| Office/Institutional/Multi-Family | B/D   | 85  | 16.2    | 0.025     | 1380         |
| Office/Institutional/Multi-Family | C     | 90  | 3.4     | 0.005     | 305          |
| Office/Institutional/Multi-Family | D     | 92  | 2.2     | 0.003     | 202          |
| High Density Residential          | B/D   | 75  | 1.7     | 0.003     | 124          |
| High Density Residential          | C     | 83  | 2.9     | 0.005     | 244          |
| Medium Density Residential        | A     | 54  | 0.1     | 0.000     | 7            |
| Medium Density Residential        | A/D   | 54  | 0.4     | 0.001     | 22           |
| Medium Density Residential        | B/D   | 70  | 20.0    | 0.031     | 1397         |
| Medium Density Residential        | C     | 80  | 21.0    | 0.033     | 1681         |
| Medium Density Residential        | D     | 85  | 1.0     | 0.002     | 83           |
| Very Low Density Residential      | A     | 49  | 0.0     | 0.000     | 0            |
| Very Low Density Residential      | B     | 69  | 2.4     | 0.004     | 166          |
| Very Low Density Residential      | B/D   | 69  | 4.4     | 0.007     | 307          |
| Very Low Density Residential      | C     | 79  | 1.3     | 0.002     | 102          |
| Very Low Density Residential      | D     | 84  | 0.3     | 0.000     | 26           |
| <b>Totals =</b>                   |       |     | 105.20  | 0.164     | 8515.3       |

**Total (weighted) RCN = total product/total area = 80.94**

**RCN used = 81**

**Subbasin: FSUT3-9C**

| Landuse                           | Soil  | RCN    | Area<br>(Acres) | Area<br>(Sq. Mi.) | Product of<br>RCN and Area |
|-----------------------------------|-------|--------|-----------------|-------------------|----------------------------|
|                                   | Group |        |                 |                   |                            |
| Right-Of-Way                      | A/D   | 83     | 0.7             | 0.001             | 61                         |
| Right-Of-Way                      | B     | 89     | 3.9             | 0.006             | 349                        |
| Right-Of-Way                      | B/D   | 89     | 3.1             | 0.005             | 274                        |
| Right-Of-Way                      | C     | 92     | 6.3             | 0.010             | 581                        |
| Right-Of-Way                      | D     | 93     | 2.4             | 0.004             | 220                        |
| Right-Of-Way                      | W     | 100    | 0.0             | 0.000             | 1                          |
| Industrial                        | C     | 91     | 0.4             | 0.001             | 34                         |
| Commercial                        | A/D   | 89     | 0.9             | 0.001             | 78                         |
| Commercial                        | B     | 92     | 2.0             | 0.003             | 188                        |
| Commercial                        | B/D   | 92     | 4.5             | 0.007             | 418                        |
| Commercial                        | C     | 94     | 0.1             | 0.000             | 14                         |
| Mixed Use/Office/Institutional    | A/D   | 77     | 0.7             | 0.001             | 56                         |
| Mixed Use/Office/Institutional    | B     | 85     | 1.5             | 0.002             | 123                        |
| Mixed Use/Office/Institutional    | B/D   | 85     | 1.4             | 0.002             | 120                        |
| Mixed Use/Office/Institutional    | C     | 90     | 0.2             | 0.000             | 20                         |
| Office/Institutional/Medical      | A/D   | 77     | 0.6             | 0.001             | 44                         |
| Office/Institutional/Medical      | B/D   | 85     | 1.8             | 0.003             | 153                        |
| Office/Institutional/Multi-Family | B     | 85     | 1.8             | 0.003             | 150                        |
| Office/Institutional/Multi-Family | C     | 90     | 1.5             | 0.002             | 137                        |
| High Density Residential          | A/D   | 61     | 0.9             | 0.001             | 56                         |
| High Density Residential          | B     | 75     | 5.3             | 0.008             | 401                        |
| High Density Residential          | B/D   | 75     | 2.5             | 0.004             | 191                        |
| High Density Residential          | C     | 83     | 6.2             | 0.010             | 512                        |
| High Density Residential          | D     | 87     | 0.0             | 0.000             | 0                          |
| High Density Residential          | W     | 100    | 0.0             | 0.000             | 0                          |
| Medium Density Residential        | B     | 70     | 4.6             | 0.007             | 321                        |
| Medium Density Residential        | B/D   | 70     | 0.1             | 0.000             | 8                          |
| Medium Density Residential        | C     | 80     | 2.7             | 0.004             | 218                        |
| Medium Density Residential        | D     | 85     | 5.6             | 0.009             | 479                        |
| Low Density Residential           | B     | 68     | 0.1             | 0.000             | 5                          |
| Low Density Residential           | C     | 79     | 11.5            | 0.018             | 907                        |
| Low Density Residential           | D     | 84     | 1.9             | 0.003             | 163                        |
| Very Low Density Residential      | B     | 69     | 1.2             | 0.002             | 80                         |
| Very Low Density Residential      | B/D   | 69     | 19.3            | 0.030             | 1329                       |
| Very Low Density Residential      | C     | 79     | 3.2             | 0.005             | 253                        |
| Very Low Density Residential      | D     | 84     | 2.1             | 0.003             | 181                        |
| Conservation/Open Space           | B/D   | 69     | 0.7             | 0.001             | 49                         |
| <b>Totals =</b>                   |       | 101.90 |                 | 0.159             | 8174.1                     |

**Total (weighted) RCN = total product/total area = 80.22**

**RCN used = 80**

**Subbasin: FSUT3-9D**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 2.3     | 0.004     | 206          |
| Right-Of-Way                      | B/D   | 89  | 0.6     | 0.001     | 55           |
| Right-Of-Way                      | C     | 92  | 1.5     | 0.002     | 141          |
| Right-Of-Way                      | D     | 93  | 0.3     | 0.001     | 30           |
| Commercial                        | B     | 92  | 1.5     | 0.002     | 142          |
| Commercial                        | B/D   | 92  | 2.1     | 0.003     | 196          |
| Commercial                        | C     | 94  | 4.2     | 0.007     | 392          |
| Commercial                        | D     | 95  | 2.2     | 0.003     | 205          |
| Office/Institutional/Multi-Family | B     | 85  | 6.6     | 0.010     | 559          |
| Office/Institutional/Multi-Family | B/D   | 85  | 1.7     | 0.003     | 146          |
| Office/Institutional/Multi-Family | C     | 90  | 10.5    | 0.016     | 941          |
| Office/Institutional/Multi-Family | D     | 92  | 0.3     | 0.000     | 24           |
| High Density Residential          | B     | 75  | 9.2     | 0.014     | 689          |
| High Density Residential          | B/D   | 75  | 0.5     | 0.001     | 40           |
| High Density Residential          | C     | 83  | 0.8     | 0.001     | 69           |
| High Density Residential          | D     | 87  | 1.2     | 0.002     | 100          |
| Medium Density Residential        | B     | 70  | 0.5     | 0.001     | 32           |
| Medium Density Residential        | C     | 80  | 1.2     | 0.002     | 100          |
| Medium Density Residential        | D     | 85  | 0.3     | 0.000     | 26           |
| Low Density Residential           | B     | 68  | 2.2     | 0.003     | 147          |
| Low Density Residential           | C     | 79  | 4.4     | 0.007     | 347          |
| Low Density Residential           | D     | 84  | 0.3     | 0.000     | 23           |
| Conservation/Open Space           | B     | 69  | 1.0     | 0.002     | 68           |
| Conservation/Open Space           | B/D   | 69  | 0.2     | 0.000     | 15           |
| Conservation/Open Space           | C     | 79  | 0.2     | 0.000     | 17           |
| Conservation/Open Space           | D     | 84  | 0.4     | 0.001     | 33           |
| <b>Totals =</b>                   |       |     | 56.14   | 0.088     | 4742.2       |

**Total (weighted) RCN = total product/total area = 84.46**

**RCN used = 84**

**Subbasin: FSUT3-10A**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B     | 89  | 6.3     | 0.010     | 557          |
| Right-Of-Way                      | B/D   | 89  | 1.2     | 0.002     | 105          |
| Right-Of-Way                      | C     | 92  | 10.0    | 0.016     | 920          |
| Right-Of-Way                      | D     | 93  | 1.8     | 0.003     | 169          |
| Office/Institutional/Multi-Family | B/D   | 85  | 0.0     | 0.000     | 0            |
| Office/Institutional/Multi-Family | C     | 90  | 0.0     | 0.000     | 1            |
| High Density Residential          | B     | 75  | 0.9     | 0.001     | 68           |
| High Density Residential          | B/D   | 75  | 5.1     | 0.008     | 384          |
| High Density Residential          | C     | 83  | 21.2    | 0.033     | 1756         |
| High Density Residential          | D     | 87  | 0.1     | 0.000     | 4            |
| Medium Density Residential        | B     | 70  | 9.2     | 0.014     | 647          |
| Medium Density Residential        | B/D   | 70  | 5.7     | 0.009     | 396          |
| Medium Density Residential        | C     | 80  | 20.6    | 0.032     | 1647         |
| Medium Density Residential        | D     | 85  | 0.2     | 0.000     | 16           |
| Low Density Residential           | B     | 68  | 22.8    | 0.036     | 1547         |
| Low Density Residential           | B/D   | 68  | 0.1     | 0.000     | 9            |
| Low Density Residential           | C     | 79  | 27.2    | 0.043     | 2150         |
| Low Density Residential           | D     | 84  | 7.1     | 0.011     | 593          |
| Very Low Density Residential      | B     | 69  | 0.0     | 0.000     | 2            |
| Very Low Density Residential      | C     | 79  | 0.0     | 0.000     | 1            |
| Conservation/Open Space           | B     | 69  | 0.1     | 0.000     | 6            |
| Conservation/Open Space           | B/D   | 69  | 6.2     | 0.010     | 429          |
| Conservation/Open Space           | C     | 79  | 2.4     | 0.004     | 189          |
| Conservation/Open Space           | D     | 84  | 8.6     | 0.013     | 724          |
| <b>Totals =</b>                   |       |     | 156.70  | 0.245     | 12321.6      |

**Total (weighted) RCN = total product/total area = 78.63**

**RCN used = 79**

**Subbasin: FSUT3-10B**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | B/D   | 89  | 0.8     | 0.001     | 67           |
| Right-Of-Way                      | C     | 92  | 0.1     | 0.000     | 11           |
| Right-Of-Way                      | D     | 93  | 0.2     | 0.000     | 17           |
| Commercial                        | B/D   | 92  | 2.8     | 0.004     | 259          |
| Commercial                        | C     | 94  | 0.6     | 0.001     | 55           |
| Commercial                        | D     | 95  | 0.1     | 0.000     | 10           |
| Office/Institutional/Multi-Family | B/D   | 85  | 14.5    | 0.023     | 1229         |
| Office/Institutional/Multi-Family | C     | 90  | 19.1    | 0.030     | 1721         |
| Office/Institutional/Multi-Family | D     | 92  | 1.3     | 0.002     | 124          |
| High Density Residential          | B     | 75  | 0.5     | 0.001     | 35           |
| High Density Residential          | B/D   | 75  | 5.7     | 0.009     | 426          |
| High Density Residential          | C     | 83  | 4.0     | 0.006     | 329          |
| High Density Residential          | D     | 87  | 1.2     | 0.002     | 101          |
| Medium Density Residential        | B/D   | 70  | 1.0     | 0.002     | 67           |
| Medium Density Residential        | D     | 85  | 0.2     | 0.000     | 19           |
| Very Low Density Residential      | B/D   | 69  | 3.9     | 0.006     | 269          |
| Very Low Density Residential      | D     | 84  | 0.1     | 0.000     | 8            |
| <b>Totals =</b>                   |       |     | 55.98   | 0.087     | 4750.4       |

**Total (weighted) RCN = total product/total area = 84.86**

**RCN used = 85**

**Subbasin: FSUT3-10C**

| Landuse                           | Soil  |     | Area    | Area      | Product of   |
|-----------------------------------|-------|-----|---------|-----------|--------------|
|                                   | Group | RCN | (Acres) | (Sq. Mi.) | RCN and Area |
| Right-Of-Way                      | A     | 83  | 3.1     | 0.005     | 258          |
| Right-Of-Way                      | B     | 89  | 6.0     | 0.009     | 536          |
| Right-Of-Way                      | B/D   | 89  | 1.5     | 0.002     | 136          |
| Right-Of-Way                      | C     | 92  | 3.6     | 0.006     | 332          |
| Right-Of-Way                      | D     | 93  | 0.9     | 0.001     | 82           |
| Office/Institutional/Multi-Family | D     | 92  | 0.1     | 0.000     | 5            |
| High Density Residential          | C     | 83  | 0.0     | 0.000     | 0            |
| Medium Density Residential        | A     | 54  | 9.7     | 0.015     | 523          |
| Medium Density Residential        | B     | 70  | 25.2    | 0.039     | 1761         |
| Medium Density Residential        | B/D   | 70  | 31.7    | 0.050     | 2220         |
| Medium Density Residential        | C     | 80  | 22.5    | 0.035     | 1803         |
| Medium Density Residential        | D     | 85  | 5.6     | 0.009     | 479          |
| Low Density Residential           | B     | 68  | 0.1     | 0.000     | 10           |
| Low Density Residential           | C     | 79  | 0.5     | 0.001     | 38           |
| Very Low Density Residential      | B     | 69  | 0.3     | 0.000     | 18           |
| Very Low Density Residential      | C     | 79  | 0.2     | 0.000     | 19           |
| Conservation/Open Space           | A     | 49  | 0.1     | 0.000     | 3            |
| Conservation/Open Space           | B     | 69  | 0.0     | 0.000     | 2            |
| Conservation/Open Space           | B/D   | 69  | 15.6    | 0.024     | 1073         |
| Conservation/Open Space           | C     | 79  | 0.3     | 0.001     | 26           |
| Conservation/Open Space           | D     | 84  | 12.1    | 0.019     | 1018         |
| <b>Totals =</b>                   |       |     | 139.17  | 0.217     | 10343.3      |

**Total (weighted) RCN = total product/total area = 74.32**

**RCN used = 74**

---

## **Appendix F:**

### **Time of Concentration Calculations**

Project: Greenville Watershed Master Plan  
 Prepared by: EVH  
 Checked by: DJK  
 Date: 5/12/2015

### Time of Concentration - Fork Swamp Watershed

| Sub-basin | Sheet Flow  |      |                     |             |                       |             | Shallow Concentration                    |                     |                  |                    |             | Channel Flow                       |                           |                          |                  |       |                    |                     | Lag<br>(min) | Calibration<br>(min) |             |             |
|-----------|-------------|------|---------------------|-------------|-----------------------|-------------|--|---------------------|------------------|--------------------|-------------|------------------------------------|---------------------------|--------------------------|------------------|-------|--------------------|---------------------|--------------|----------------------|-------------|-------------|
|           | Description | n    | Flow Length<br>(ft) | P-2<br>(in) | Land Slope<br>(ft/ft) | Tt<br>(min) | Surface Description<br>0-Unpaved/1-Paved | Flow Length<br>(ft) | Slope<br>(ft/ft) | Velocity<br>(ft/s) | Tt<br>(min) | Channel Area<br>(ft <sup>2</sup> ) | Channel Perimeter<br>(ft) | Hydraulic Radius<br>(ft) | Slope<br>(ft/ft) | n     | Velocity<br>(ft/s) | Flow Length<br>(ft) |              |                      | Tt<br>(min) | Tc<br>(min) |
| FS-1A     | Grass       | 0.24 | 324                 | 3.76        | 0.006                 | 54.04       | 1  | 494                 | 0.004            | 1.29               | 6.36        | 57.5                               | 21.4                      | 2.69                     | 0.001            | 0.04  | 1.80               | 1503.8              | 13.89        | 74.29                | 44.57       |             |
| FS-1B     | Grass       | 0.24 | 276                 | 3.76        | 0.007                 | 44.56       | 0  | 468                 | 0.004            | 1.03               | 7.54        | Pipe                               |                           |                          | 0.004            | 0.013 | 5.00               | 272                 | 0.91         | 65.87                | 39.52       |             |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 125                                | 30                        | 4.17                     | 0.001            | 0.04  | 2.20               | 1701                | 12.86        |                      |             |             |
| FS-2A     | Grass       | 0.24 | 313                 | 3.76        | 0.001                 | 118.70      | 1  | 439                 | 0.002            | 0.92               | 7.94        | 57                                 | 20                        | 2.85                     | 0.000            | 0.04  | 1.43               | 1076.7              | 12.55        | 139.19               | 83.51       |             |
| FS-2B     | Grass       | 0.24 | 238                 | 3.76        | 0.002                 | 68.72       | 0  | 311                 | 0.005            | 1.17               | 4.43        | Pipe                               |                           |                          | 0.009            | 0.013 | 5.00               | 218                 | 0.73         | 76.68                | 46.01       |             |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 110                                | 28.3                      | 3.89                     | 0.003            | 0.04  | 4.73               | 795                 | 2.80         |                      |             |             |
| FS-3      | Grass       | 0.24 | 248                 | 3.76        | 0.001                 | 110.22      | 0  | 600                 | 0.003            | 0.90               | 11.17       | Pipe                               |                           |                          | 0.005            | 0.013 | 5.00               | 1094                | 3.65         | 133.71               | 80.23       |             |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 130                                | 30.4                      | 4.28                     | 0.000            | 0.04  | 1.41               | 734                 | 8.67         |                      |             |             |
| FS-4A     | Grass       | 0.24 | 148                 | 3.76        | 0.002                 | 46.89       | 0  | 329                 | 0.001            | 0.48               | 11.45       | 29.6                               | 14.9                      | 1.99                     | 0.000            | 0.04  | 1.07               | 2218.6              | 34.55        | 92.90                | 55.74       |             |
| FS-4B     | Grass       | 0.24 | 120                 | 3.76        | 0.007                 | 23.05       | 0  | 293                 | 0.004            | 0.98               | 5.01        | Pipe                               |                           |                          | 0.001            | 0.013 | 5.00               | 1744                | 5.81         | 38.66                | 23.20       |             |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 125                                | 30                        | 4.17                     | 0.002            | 0.04  | 4.71               | 1353                | 4.79         |                      |             |             |
| FS-5      | Grass       | 0.24 | 188                 | 3.76        | 0.011                 | 27.99       | 0  | 476                 | 0.012            | 1.73               | 4.58        | 204.3                              | 44.6                      | 4.58                     | 0.000            | 0.045 | 2.03               | 699                 | 5.74         | 38.31                | 22.98       |             |
| FS-6A     | Woods       | 0.40 | 243                 | 3.76        | 0.008                 | 57.48       | 0  | 640                 | 0.002            | 0.66               | 16.13       | Pipe                               |                           |                          | 0.001            | 0.013 | 5.00               | 1482                | 4.94         | 78.55                | 47.13       | 94.26       |
| FS-6B     | Woods       | 0.40 | 217                 | 3.76        | 0.002                 | 103.08      | 0  | 629                 | 0.003            | 0.91               | 11.52       | Pipe                               |                           |                          | 0.004            | 0.013 | 5.00               | 1154                | 3.85         | 118.44               | 71.07       | 142.13      |
| FS-6C     | Woods       | 0.40 | 305                 | 3.76        | 0.004                 | 95.95       | 0  | 348                 | 0.001            | 0.43               | 13.40       | Pipe                               |                           |                          | 0.002            | 0.013 | 5.00               | 1326                | 4.42         | 120.31               | 72.19       | 144.37      |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 184.32                             | 43.6                      | 4.23                     | 0.003            | 0.045 | 4.87               | 1911                | 6.54         |                      |             |             |
| FS-6D     | Woods       | 0.40 | 210                 | 3.76        | 0.001                 | 110.83      | 0  | 326                 | 0.003            | 0.86               | 6.35        | 204.3                              | 44.6                      | 4.58                     | 0.002            | 0.045 | 3.72               | 2226                | 9.97         | 127.15               | 76.29       | 152.58      |
| FS-6E     | Grass       | 0.24 | 225                 | 3.76        | 0.001                 | 80.03       | 0  | 250                 | 0.008            | 1.44               | 2.90        | Pipe                               |                           |                          | 0.004            | 0.013 | 5.00               | 2128                | 7.09         | 90.02                | 54.01       | 108.03      |
| FS-6F     | Grass       | 0.24 | 293                 | 3.76        | 0.000                 | 158.50      | 0  | 474                 | 0.008            | 1.48               | 5.32        | 73.28                              | 24                        | 3.05                     | 0.006            | 0.045 | 5.61               | 1867                | 5.55         | 169.37               | 101.62      | 203.25      |
| FS-7A     | Grass       | 0.24 | 277                 | 3.76        | 0.004                 | 56.68       | 0  | 393                 | 0.001            | 0.41               | 16.09       | Pipe                               |                           |                          | 0.003            | 0.013 | 5.00               | 3122                | 10.41        | 88.17                | 52.90       | 105.81      |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 27.5                               | 18.9                      | 1.46                     | 0.007            | 0.045 | 3.64               | 1093                | 5.00         |                      |             |             |
| FS-7B     | Grass       | 0.24 | 181                 | 3.76        | 0.001                 | 61.68       | 1  | 211                 | 0.001            | 0.70               | 5.03        | Pipe                               |                           |                          | 0.005            | 0.013 | 5.00               | 2376                | 7.92         | 76.60                | 45.96       | 91.92       |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 143                                | 43.8                      | 3.26                     | 0.006            | 0.045 | 5.72               | 677                 | 1.97         |                      |             |             |
| FS-8A     | Woods       | 0.40 | 306                 | 3.76        | 0.004                 | 96.03       | 0  | 357                 | 0.001            | 0.43               | 13.91       | 108.5                              | 27.7                      | 3.92                     | 0.000            | 0.045 | 1.76               | 1789                | 16.95        | 126.89               | 76.14       |             |
| FS-8B     | Woods       | 0.40 | 222                 | 3.76        | 0.001                 | 118.72      | 0  | 642                 | 0.003            | 0.90               | 11.88       | Pipe                               |                           |                          | 0.000            | 0.013 | 5.00               | 2128                | 7.09         | 137.69               | 82.61       |             |
| FS-8C     | Grass       | 0.24 | 169                 | 3.76        | 0.001                 | 58.62       | 0  | 399                 | 0.015            | 1.96               | 3.39        | Pipe                               |                           |                          | 0.004            | 0.013 | 5.00               | 582                 | 1.94         | 67.56                | 40.54       |             |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 68.3                               | 22.5                      | 3.04                     | 0.003            | 0.045 | 3.55               | 770                 | 3.61         |                      |             |             |
| FS-8D     | Grass       | 0.24 | 254                 | 3.76        | 0.002                 | 71.42       | 0  | 194                 | 0.012            | 1.80               | 1.79        | Pipe                               |                           |                          | 0.008            | 0.013 | 5.00               | 1265                | 4.22         | 81.69                | 49.02       |             |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 97.9                               | 27.2                      | 3.60                     | 0.006            | 0.045 | 6.20               | 1585                | 4.26         |                      |             |             |
| FS-8E     | Woods       | 0.40 | 181                 | 3.76        | 0.011                 | 41.04       | 0  | 645                 | 0.012            | 1.80               | 5.98        | 93.9                               | 25.6                      | 3.67                     | 0.003            | 0.045 | 4.61               | 2651                | 9.58         | 56.60                | 33.96       |             |
| FS-9      | Woods       | 0.40 | 332                 | 3.76        | 0.003                 | 117.32      | 0  | 545                 | 0.004            | 0.98               | 9.29        | 93.9                               | 25.6                      | 3.67                     | 0.003            | 0.045 | 4.29               | 1362                | 5.29         | 131.90               | 79.14       |             |
| FS-10A    | Woods       | 0.40 | 165                 | 3.76        | 0.001                 | 99.97       | 0  | 191                 | 0.004            | 0.98               | 3.26        | Pipe                               |                           |                          | 0.001            | 0.013 | 5.00               | 1043                | 3.48         | 106.71               | 64.03       |             |



| Sub-basin | Sheet Flow  |      |                     |             |                       |             | Shallow Concentration                    |                     |                  |                    |             | Channel Flow          |                           |                          |                  |       |                    |                     |             | Lag<br>(min) | Calibration<br>(min) |             |
|-----------|-------------|------|---------------------|-------------|-----------------------|-------------|--|---------------------|------------------|--------------------|-------------|-----------------------|---------------------------|--------------------------|------------------|-------|--------------------|---------------------|-------------|--------------|----------------------|-------------|
|           | Description | n    | Flow Length<br>(ft) | P-2<br>(in) | Land Slope<br>(ft/ft) | Tt<br>(min) | Surface Description<br>0-Unpaved/1-Paved | Flow Length<br>(ft) | Slope<br>(ft/ft) | Velocity<br>(ft/s) | Tt<br>(min) | Channel Area<br>(ft2) | Channel Perimeter<br>(ft) | Hydraulic Radius<br>(ft) | Slope<br>(ft/ft) | n     | Velocity<br>(ft/s) | Flow Length<br>(ft) | Tt<br>(min) |              |                      | Tc<br>(min) |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             |                       |                           |                          |                  |       |                    |                     |             |              |                      |             |
| FS-10B    | Grass       | 0.24 | 155                 | 3.76        | 0.001                 | 74.10       | 0  | 224                 | 0.001            | 0.54               | 6.91        | 44                    | 18.3                      | 2.40                     | 0.004            | 0.045 | 3.86               | 4244                | 18.30       | 99.31        | 59.59                |             |
| FS-10C    | Grass       | 0.24 | 229                 | 3.76        | 0.001                 | 100.35      | 0  | 319                 | 0.031            | 2.86               | 1.86        | 93.9                  | 25.6                      | 3.67                     | 0.000            | 0.045 | 0.56               | 2027                | 60.83       | 163.03       | 97.82                |             |
| FS-10D    | Grass       | 0.24 | 298                 | 3.76        | 0.000                 | 141.53      | 0  | 549                 | 0.003            | 0.90               | 10.20       | 16.5                  | 10.7                      | 1.54                     | 0.007            | 0.045 | 3.65               | 3530                | 16.12       | 167.86       | 100.72               |             |
| FS-10E    | Grass       | 0.24 | 219                 | 3.76        | 0.010                 | 33.07       | 0  | 527                 | 0.011            | 1.70               | 5.15        | 93.9                  | 25.6                      | 3.67                     | 0.002            | 0.045 | 3.82               | 2441                | 10.65       | 48.87        | 29.32                |             |
| FS-10F    | Woods       | 0.40 | 182                 | 3.76        | 0.009                 | 44.18       | 0  | 261                 | 0.002            | 0.63               | 6.89        | 45.1                  | 17.8                      | 2.53                     | 0.006            | 0.045 | 4.72               | 2390                | 8.43        | 59.50        | 35.70                |             |
| FSUT1-1A  | Woods       | 0.40 | 403                 | 3.76        | 0.005                 | 105.60      | 0  | 426                 | 0.000            | 0.08               | 90.67       | 32.5                  | 15.2                      | 2.14                     | 0.000            | 0.045 | 1.08               | 5189                | 79.95       | 276.22       | 165.73               |             |
| FSUT1-1B  | Grass       | 0.24 | 293                 | 3.76        | 0.001                 | 93.99       | 0  | 343                 | 0.005            | 1.11               | 5.16        | 32.5                  | 15.2                      | 2.14                     | 0.001            | 0.045 | 2.00               | 4551                | 37.92       | 137.07       | 82.24                |             |
| FSUT1-1C  | Woods       | 0.40 | 352                 | 3.76        | 0.009                 | 74.16       | 0  | 274                 | 0.010            | 1.63               | 2.81        | 32.5                  | 15.2                      | 2.14                     | 0.002            | 0.045 | 2.46               | 4051                | 27.39       | 104.36       | 62.61                |             |
| FSUT1-2A  | Woods       | 0.40 | 512                 | 3.76        | 0.003                 | 158.54      | 0  | 676                 | 0.003            | 0.88               | 12.84       | 16.5                  | 10.7                      | 1.54                     | 0.000            | 0.045 | 0.88               | 5005                | 94.28       | 265.66       | 159.40               |             |
| FSUT1-2B  | Woods       | 0.40 | 317                 | 3.76        | 0.000                 | 230.33      | 0  | 768                 | 0.003            | 0.81               | 15.85       | 16.5                  | 10.7                      | 1.54                     | 0.001            | 0.045 | 1.11               | 3180                | 47.75       | 293.94       | 176.36               |             |
| FSUT1-2C  | Woods       | 0.40 | 286                 | 3.76        | 0.001                 | 175.84      | 0  | 331                 | 0.006            | 1.25               | 4.40        | 16.5                  | 10.7                      | 1.54                     | 0.002            | 0.045 | 1.88               | 2224                | 19.74       | 199.98       | 119.99               |             |
| FSUT1-2D  | Woods       | 0.40 | 442                 | 3.76        | 0.001                 | 270.57      | 0  | 621                 | 0.019            | 2.25               | 4.60        | 41.3                  | 18.3                      | 2.26                     | 0.002            | 0.045 | 2.34               | 2379                | 16.93       | 292.10       | 175.26               |             |
| FSUT1-2E  | Woods       | 0.40 | 288                 | 3.76        | 0.005                 | 81.15       | 0  | 475                 | 0.006            | 1.28               | 6.18        | Pipe                  |                           |                          | 0.006            | 0.013 | 5.00               | 1369                | 4.56        | 98.40        | 59.04                |             |
| FSUT1-2F  | Grass       | 0.24 | 280                 | 3.76        | 0.014                 | 34.38       | 0  | 267.00001           | 0.022            | 2.42               | 1.84        | 150                   | 32.4                      | 4.63                     | 0.004            | 0.045 | 5.48               | 2137                | 6.50        |              |                      |             |
| FSUT1-2G  | Grass       | 0.24 | 234                 | 3.76        | 0.018                 | 27.20       | 0  | 479                 | 0.005            | 1.09               | 7.33        | 16.5                  | 10.7                      | 1.54                     | 0.006            | 0.045 | 3.30               | 2121                | 10.70       | 46.92        | 28.15                |             |
| FSUT1-3   | Grass       | 0.24 | 194                 | 3.76        | 0.009                 | 30.43       | 0  | 339                 | 0.021            | 2.34               | 2.41        | Pipe                  |                           |                          | 0.015            | 0.013 | 5.00               | 980                 | 3.27        | 45.07        | 27.04                |             |
| FSUT2-1   | Woods       | 0.40 | 132                 | 3.76        | 0.002                 | 63.41       | 0  | 839                 | 0.001            | 0.53               | 26.33       | 88                    | 31.8                      | 2.77                     | 0.003            | 0.045 | 3.63               | 1951                | 8.95        |              |                      | 37          |
| FSUT2-2   | Woods       | 0.40 | 39                  | 3.76        | 0.003                 | 21.19       | 0  | 220                 | 0.007            | 1.37               | 2.67        | 145                   | 34.8                      | 4.17                     | 0.008            | 0.045 | 7.91               | 302                 | 0.64        |              |                      |             |
| FSUT2-3   | Woods       | 0.40 | 83                  | 3.76        | 0.011                 | 21.93       | 0  | 331                 | 0.003            | 0.88               | 6.24        | 145                   | 34.8                      | 4.17                     | 0.000            | 0.035 | 1.08               | 1046.7              | 16.12       | 39.98        | 23.99                |             |
| FSUT2-4   | Grass       | 0.24 | 251                 | 3.76        | 0.001                 | 91.34       | 0  | 869                 | 0.002            | 0.77               | 18.72       | 108.5                 | 27.7                      | 3.92                     | 0.002            | 0.035 | 4.27               | 3057.9              | 11.93       | 40.10        | 24.06                | 48          |
| FSUT2-5   | Grass       | 0.24 | 43                  | 3.76        | 0.006                 | 11.07       | 0  | 468                 | 0.000            | 0.24               | 33.04       | 95                    | 30.6                      | 3.10                     | 0.001            | 0.035 | 2.56               | 2524.1              | 16.43       | 126.50       | 75.90                | 151.80      |
| FSUT2-6   | Woods       | 0.4  | 166                 | 3.76        | 0.001                 | 120.32      | 0  | 672                 | 0.000            | 0.31               | 36.03       | Pipe                  |                           |                          | 0.001            | 0.013 | 5.00               | 2231.6              | 7.44        | 56.14        | 33.68                | 101.04      |
| FSUT2-7A  | Grass       | 0.24 | 150                 | 3.76        | 0.009                 | 25.59       | 0  | 528                 | 0.000            | 0.24               | 36.19       | 296                   | 58.5                      | 5.06                     | 0.002            | 0.035 | 6.14               | 1687.8              | 4.58        |              |                      |             |
| FSUT2-7B  | Grass       | 0.24 | 235                 | 3.76        | 0.009                 | 36.62       | 0  | 478                 | 0.004            | 0.97               | 8.24        | 108.5                 | 27.7                      | 3.92                     | 0.003            | 0.045 | 4.75               | 3033                | 10.65       | 166.99       | 100.20               |             |
| FSUT2-8A  | Grass       | 0.24 | 251                 | 3.76        | 0.000                 | 131.36      | 0  | 359                 | 0.001            | 0.43               | 14.03       | 94                    | 25.6                      | 3.67                     | 0.004            | 0.045 | 5.07               | 3446.3              | 11.34       | 56.20        | 33.72                |             |
| FSUT2-8B  | Grass       | 0.24 | 129                 | 3.76        | 0.001                 | 59.37       | 0  | 343                 | 0.001            | 0.43               | 13.21       | 94                    | 25.6                      | 3.67                     | 0.005            | 0.045 | 5.71               | 3826.7              | 11.17       | 156.56       | 93.94                | 300         |
| FSUT2-9A  | Grass       | 0.24 | 183                 | 3.76        | 0.011                 | 27.27       | 1  | 274                 | 0.000            | 0.42               | 10.88       | 94                    | 25.6                      | 3.67                     | 0.004            | 0.045 | 5.07               | 3446.3              | 11.34       | 83.91        | 50.35                | 20          |
| FSUT2-9B  | Grass       | 0.24 | 128                 | 3.76        | 0.016                 | 17.76       | 1  | 275                 | 0.014            | 2.42               | 1.89        | 16.5                  | 10.7                      | 1.54                     | 0.003            | 0.045 | 2.49               | 2418.1              | 16.20       | 54.35        | 32.61                | 16          |
| FSUT3-1A  | Grass       | 0.24 | 153                 | 3.76        | 0.005                 | 33.38       | 0  | 214                 | 0.000            | 0.22               | 16.14       | Pipe                  |                           |                          | 0.006            | 0.013 | 5.00               | 715                 | 2.38        | 30.80        | 18.48                | 15          |
| FSUT3-1B  | Grass       | 0.24 | 145                 | 3.76        | 0.014                 | 20.52       | 0  | 489                 | 0.000            | 0.23               | 35.35       | 94                    | 25.6                      | 3.67                     | 0.004            | 0.045 | 4.72               | 2480.1              | 8.76        |              |                      |             |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | Pipe                  |                           |                          | 0.001            | 0.013 | 5.00               | 1057.8              | 3.53        |              |                      |             |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | Pipe                  |                           |                          | 0.003            | 0.013 | 5.00               | 951                 | 3.17        | 61.01        | 36.61                |             |
|           |             |      |                     |             |                       |             |  |                     |                  |                    |             | 270                   | 44.4                      | 6.08                     | 0.002            | 0.045 | 4.49               | 531                 | 1.97        |              |                      |             |

| Sub-basin | Sheet Flow  |      |                     |             |                       |             | Shallow Concentration                    |                     |                  |                    |             | Channel Flow          |                           |                          |                  |       |                    |                     |             | Lag<br>(min) | Calibration<br>(min) |             |        |
|-----------|-------------|------|---------------------|-------------|-----------------------|-------------|--|---------------------|------------------|--------------------|-------------|-----------------------|---------------------------|--------------------------|------------------|-------|--------------------|---------------------|-------------|--------------|----------------------|-------------|--------|
|           | Description | n    | Flow Length<br>(ft) | P-2<br>(in) | Land Slope<br>(ft/ft) | Tt<br>(min) | Surface Description<br>0-Unpaved/1-Paved | Flow Length<br>(ft) | Slope<br>(ft/ft) | Velocity<br>(ft/s) | Tt<br>(min) | Channel Area<br>(ft2) | Channel Perimeter<br>(ft) | Hydraulic Radius<br>(ft) | Slope<br>(ft/ft) | n     | Velocity<br>(ft/s) | Flow Length<br>(ft) | Tt<br>(min) |              |                      | Tc<br>(min) |        |
| FSUT3-1C  | Woods       | 0.40 | 184                 | 3.76        | 0.001                 | 136.05      | 0  | 270                 | 0.000            | 0.31               | 14.53       | Pipe                  |                           |                          |                  | 0.001 | 0.013              | 5.00                | 2118        | 7.06         | 157.64               | 94.59       | 57.33  |
| FSUT3-1D  | Woods       | 0.40 | 158                 | 3.76        | 0.003                 | 65.20       | 0  | 465                 | 0.001            | 0.39               | 19.92       | Pipe                  | 69.8                      | 22.2                     | 3.14             | 0.002 | 0.013              | 5.00                | 662         | 2.21         | 95.55                | 57.33       |        |
| FSUT3-1E  | Woods       | 0.40 | 79                  | 3.76        | 0.001                 | 49.73       | 0  | 245                 | 0.001            | 0.61               | 6.70        | Pipe                  | 170                       | 35.3                     | 4.82             | 0.003 | 0.013              | 5.00                | 272         | 0.91         | 63.29                | 37.97       |        |
| FSUT3-2A  | Woods       | 0.40 | 168                 | 3.76        | 0.001                 | 122.75      | 0  | 490                 | 0.001            | 0.36               | 22.40       | Pipe                  | 16.5                      | 10.7                     | 1.54             | 0.002 | 0.045              | 1.84                | 1162        | 10.55        | 157.68               | 94.61       |        |
| FSUT3-2B  | Woods       | 0.40 | 194                 | 3.76        | 0.001                 | 145.31      | 0  | 465                 | 0.013            | 1.83               | 4.23        | Pipe                  | 344                       | 56.7                     | 6.07             | 0.001 | 0.045              | 4.11                | 1454        | 5.90         | 155.44               | 93.26       |        |
| FSUT3-3   | Woods       | 0.40 | 160                 | 3.76        | 0.003                 | 63.93       | 0  | 271                 | 0.001            | 0.38               | 11.88       | Pipe                  | 344                       | 56.7                     | 6.07             | 0.005 | 0.013              | 5.00                | 1821        | 6.07         | 85.03                | 51.02       | 200.00 |
| FSUT3-4A  | Woods       | 0.40 | 333                 | 3.76        | 0.000                 | 278.47      | 0  | 356                 | 0.001            | 0.43               | 13.87       | Pipe                  | 160                       | 35.6                     | 4.49             | 0.003 | 0.013              | 5.00                | 1072        | 3.57         | 298.21               | 178.93      | 89.46  |
| FSUT3-4B  | Woods       | 0.40 | 201                 | 3.76        | 0.000                 | 152.10      | 1  | 229                 | 0.000            | 0.42               | 8.98        | Pipe                  | 160                       | 35.6                     | 4.49             | 0.003 | 0.013              | 5.00                | 832         | 2.77         | 175.28               | 105.17      | 52.59  |
| FSUT3-4C  | Woods       | 0.40 | 177                 | 3.76        | 0.003                 | 64.96       | 0  | 318                 | 0.000            | 0.29               | 18.53       | Pipe                  | 160                       | 35.6                     | 4.49             | 0.002 | 0.013              | 5.00                | 1735        | 5.78         | 95.93                | 57.56       |        |
| FSUT3-4D  | Grass       | 0.24 | 161                 | 3.76        | 0.005                 | 34.00       | 1  | 380                 | 0.011            | 2.09               | 3.03        | Pipe                  | 250                       | 54.3                     | 4.60             | 0.003 | 0.045              | 5.06                | 1990        | 6.56         | 43.59                | 26.15       | 52.30  |
| FSUT3-5   | Woods       | 0.4  | 357                 | 3.76        | 0.004                 | 102.33      | 0  | 534                 | 0.004            | 1.00               | 8.94        | Pipe                  | 135                       | 34.8                     | 3.88             | 0.005 | 0.045              | 5.85                | 1570.9      | 4.48         | 115.74               | 69.45       | 21.00  |
| FSUT3-6   | Grass       | 0.24 | 205                 | 3.76        | 0.005                 | 41.12       | 0  | 295                 | 0.006            | 1.26               | 3.91        | Pipe                  | 161                       | 36                       | 4.47             | 0.003 | 0.045              | 4.86                | 1959.4      | 6.71         | 51.75                | 31.05       | 20.00  |
| FSUT3-7   | Woods       | 0.4  | 263                 | 3.76        | 0.003                 | 93.54       | 0  | 484                 | 0.003            | 0.82               | 9.83        | Pipe                  | 119                       | 33.2                     | 3.58             | 0.003 | 0.045              | 4.35                | 2560.3      | 9.80         | 113.17               | 67.90       | 95.80  |
| FSUT3-8   | Grass       | 0.24 | 190                 | 3.76        | 0.005                 | 38.06       | 0  | 451                 | 0.014            | 1.91               | 3.93        | Pipe                  | 119                       | 33.2                     | 3.58             | 0.002 | 0.045              | 3.27                | 1238.8      | 6.32         | 48.32                | 28.99       | 220.00 |
| FSUT3-9A  | Grass       | 0.24 | 181                 | 3.76        | 0.001                 | 88.74       | 1  | 238                 | 0.001            | 0.66               | 6.01        | Pipe                  | 45                        | 18.6                     | 2.42             | 0.006 | 0.045              | 4.54                | 1389        | 5.10         | 99.86                | 59.91       |        |
| FSUT3-9B  | Grass       | 0.24 | 394                 | 3.76        | 0.000                 | 225.88      | 0  | 559                 | 0.011            | 1.67               | 5.58        | Pipe                  | 60                        | 20.6                     | 2.91             | 0.001 | 0.045              | 2.02                | 2244        | 18.49        | 249.95               | 149.97      |        |
| FSUT3-9C  | Grass       | 0.24 | 238                 | 3.76        | 0.008                 | 37.50       | 0  | 560                 | 0.004            | 0.97               | 9.62        | Pipe                  | 84                        | 26                       | 3.23             | 0.003 | 0.013              | 5.00                | 626         | 2.09         | 55.16                | 33.10       |        |
| FSUT3-9D  | Grass       | 0.24 | 316                 | 3.76        | 0.004                 | 61.75       | 0  | 127                 | 0.016            | 2.02               | 1.05        | Pipe                  | 16.5                      | 10.7                     | 1.54             | 0.005 | 0.013              | 5.00                | 1165        | 3.88         | 79.77                | 47.86       |        |
| FSUT3-10A | Grass       | 0.24 | 295                 | 3.76        | 0.000                 | 159.68      | 1  | 593                 | 0.000            | 0.42               | 23.70       | Pipe                  | 16.5                      | 10.7                     | 1.54             | 0.001 | 0.045              | 1.71                | 1342        | 13.09        |                      | 121.61      |        |
| FSUT3-10B | Grass       | 0.24 | 155                 | 3.76        | 0.001                 | 73.99       | 0  | 475                 | 0.001            | 0.37               | 21.42       | Pipe                  | 16.5                      | 10.7                     | 1.54             | 0.005 | 0.045              | 3.14                | 1841        | 9.77         | 105.17               | 63.10       |        |
| FSUT3-10C | Grass       | 0.24 | 236                 | 3.76        | 0.005                 | 44.93       | 0  | 390                 | 0.007            | 1.36               | 4.76        | Pipe                  | 16.5                      | 10.7                     | 1.54             | 0.003 | 0.05               | 2.18                | 4694        | 35.96        | 85.66                | 51.40       |        |

---

## **Appendix G:**

### **Preliminary Opinion of Probable Construction Costs**

#### List of Contents:

1. Unit Cost Table
  2. Flood Control Projects
  3. Stream Stabilization Projects
  4. BMP Projects
-

### Unit Costs - Fork Swamp Watershed Master Plan

| <i>Item Description</i> |  | <i>Unit</i> | <i>Unit Price</i> |
|-------------------------|--|-------------|-------------------|
| 1                       | Mobilization (10%)                             | LS          |                   |
| 2                       | Comprehensive Grading (20%)                    | LS          |                   |
| 3                       | Excavation                                     | CY          | \$ 25.00          |
| 4                       | Hauling  | CY          | \$ 4.00           |
| 5                       | Clearing & Grubbing                            | AC          | \$ 5,000.00       |
| 6                       | Channel Grading including seeding              | SY          | \$ 15.00          |
| 7                       | Construction Staking (0-300000)                | LS          | \$ 3,000.00       |
| 8                       | Construction Staking (300000-800000)           | LS          | \$ 6,000.00       |
| 9                       | Construction Staking (Greater than 800000)     | LS          | \$ 10,000.00      |
| 10                      | Select Material                                | CY          | \$ 25.00          |
| 11                      | Flowable Fill                                  | CY          | \$ 500.00         |
| 12                      | 8" Perforated PVC Underdrain                   | LF          | \$ 10.00          |
| 13                      | 8" PVC Pipe, SDR 35                            | LF          | \$ 10.00          |
| 14                      | 15" PVC Pipe, SDR 35                           | LF          | \$ 18.00          |
| 15                      | 18" PVC Pipe, SDR 35                           | LF          | \$ 25.00          |
| 16                      | 24" PVC Pipe, SDR 35                           | LF          | \$ 28.00          |
| 17                      | 12" R.C. Pipe Culvert, Class III               | LF          | \$ 45.00          |
| 18                      | 15" R.C. Pipe Culvert, Class III               | LF          | \$ 50.00          |
| 19                      | 18" R.C. Pipe Culvert, Class III               | LF          | \$ 55.00          |
| 20                      | 18" R.C. Pipe Culvert, Class IV                | LF          | \$ 60.00          |
| 21                      | 24" R.C. Pipe Culvert, Class III               | LF          | \$ 70.00          |
| 22                      | 24" R.C. Pipe Culvert, Class IV                | LF          | \$ 75.00          |
| 23                      | 30" R.C. Pipe Culvert, Class III               | LF          | \$ 90.00          |
| 24                      | 30" R.C. Pipe Culvert, Class IV, 0' - 6' depth | LF          | \$ 100.00         |
| 25                      | 36" R.C. Pipe Culvert, Class III               | LF          | \$ 120.00         |
| 26                      | 36" R.C. Pipe Culvert, Class IV                | LF          | \$ 130.00         |
| 27                      | 36" Steel Pipe Culvert (Tunnel Installation)   | LF          | \$ 800.00         |
| 28                      | 42" R.C. Pipe Culvert, Class III               | LF          | \$ 150.00         |
| 29                      | 42" R.C. Pipe Culvert, Class IV                | LF          | \$ 165.00         |
| 30                      | 48" R.C. Pipe Culvert, Class III               | LF          | \$ 180.00         |
| 31                      | 48" R.C. Pipe Culvert, Class IV                | LF          | \$ 195.00         |
| 32                      | 48" Steel Pipe Culvert (Tunnel Installation)   | LF          | \$ 1,100.00       |
| 33                      | 54" R.C. Pipe Culvert, Class III               | LF          | \$ 200.00         |
| 34                      | 60" R.C. Pipe Culvert, Class III               | LF          | \$ 225.00         |
| 35                      | 60" Steel Pipe Culvert (Tunnel Installation)   | LF          | \$ 1,500.00       |
| 36                      | 66" R.C. Pipe Culverts, Class III              | LF          | \$ 260.00         |
| 37                      | 72" R.C. Pipe Culvert, Class III               | LF          | \$ 320.00         |
| 38                      | 72" R.C. Pipe Culvert, Class IV                | LF          | \$ 370.00         |
| 39                      | 72" Steel Pipe Culvert (Tunnel Installation)   | LF          | \$ 1,800.00       |
| 40                      | 78" R.C. Pipe Culvert, Class III               | LF          | \$ 350.00         |
| 41                      | 4' x 4' Precast R.C. Box Culvert               | LF          | \$ 400.00         |
| 42                      | 5' x 3' Precast R.C. Box Culvert               | LF          | \$ 450.00         |
| 43                      | 5' x 4' Precast R.C. Box Culvert               | LF          | \$ 500.00         |
| 44                      | 6' x 3' Precast R.C. Box Culvert               | LF          | \$ 600.00         |
| 45                      | 6' x 4' Precast R.C. Box Culvert               | LF          | \$ 650.00         |
| 46                      | 6' x 5' Precast R.C. Box Culvert               | LF          | \$ 700.00         |
| 47                      | 7' x 5' Precast R.C. Box Culvert               | LF          | \$ 750.00         |
| 48                      | 7' x 6' Precast R.C. Box Culvert               | LF          | \$ 850.00         |
| 49                      | 7' x 7' Reinforced Concrete Box Culvert        | LF          | \$ 1,200.00       |

| <b>Item Description</b> |   | <b>Unit</b> | <b>Unit Price</b> |
|-------------------------|---|-------------|-------------------|
| 50                      | 8' x 4' Precast R.C. Box Culvert                        | LF          | \$ 750.00         |
| 51                      | 8' x 5' Precast R.C. Box Culvert                        | LF          | \$ 900.00         |
| 52                      | 8' X 6' Reinforced Concrete Box Culvert                 | LF          | \$ 1,200.00       |
| 53                      | 9' x 5' Precast R.C. Box Culvert                        | LF          | \$ 1,100.00       |
| 54                      | 9' X 6' Reinforced Concrete Box Culvert                 | LF          | \$ 1,400.00       |
| 55                      | 10' x 4' Precast R.C. Box Culvert                       | LF          | \$ 1,050.00       |
| 56                      | 10 x 5' Precast R.C. Box Culvert                        | LF          | \$ 1,200.00       |
| 57                      | 10' x 6' Precast R.C. Box Culvert                       | LF          | \$ 1,450.00       |
| 58                      | 11' x 4' Precast R.C. Box Culvert                       | LF          | \$ 1,150.00       |
| 59                      | 11' x 6' Precast R.C. Box Culvert                       | LF          | \$ 1,500.00       |
| 60                      | 11' x 7' Precast R.C. Box Culvert                       | LF          | \$ 1,800.00       |
| 61                      | Drainage Structures, Manhole                            | EA          | \$ 3,500.00       |
| 62                      | Drainage Structures, Inlet                              | EA          | \$ 3,000.00       |
| 63                      | Drainage Structures, DOT Standard Endwall               | EA          | \$ 6,000.00       |
| 64                      | Drainage Structures, Box Culvert Custom Endwall         | EA          | \$ 15,000.00      |
| 65                      | BMP Outlet Structure                                    | EA          | \$ 4,000.00       |
| 66                      | Convert Yard Inlet to Junction Box                      | EA          | \$ 1,500.00       |
| 67                      | Curb Cut  | EA          | \$ 400.00         |
| 68                      | Flared End Section, 18 inch                             | EA          | \$ 1,000.00       |
| 69                      | Flared End Section, 24 inch                             | EA          | \$ 2,000.00       |
| 70                      | Flared End Section, 36 inch                             | EA          | \$ 2,500.00       |
| 71                      | Flared End Section, 42 inch                             | EA          | \$ 2,500.00       |
| 72                      | Flared End Section, 48 inch                             | EA          | \$ 3,000.00       |
| 73                      | Custom Junction Box                                     | EA          | \$ 15,000.00      |
| 74                      | Concrete Curb and Gutter                                | LF          | \$ 35.00          |
| 75                      | 6" Concrete Driveway Replacement                        | EA          | \$ 1,500.00       |
| 76                      | 4" Concrete Sidewalk                                    | LF          | \$ 40.00          |
| 77                      | Concrete Pipe Plug                                      | EA          | \$ 450.00         |
| 78                      | Asphalt Milling/Overlay                                 | SY          | \$ 30.00          |
| 79                      | Asphalt Replacement (Surface, Base Course, & Milling)   | SY          | \$ 55.00          |
| 80                      | ABC Stone   | TN          | \$ 35.00          |
| 81                      | Rip Rap Stone, Class B                                  | TN          | \$ 65.00          |
| 82                      | Rip Rap Stone, Class 1                                  | TN          | \$ 70.00          |
| 83                      | Rip Rap Stone, Class A                                  | TN          | \$ 65.00          |
| 84                      | #5 stone  | TN          | \$ 50.00          |
| 85                      | #57 stone   | TN          | \$ 65.00          |
| 86                      | Gravel Walkway #78 stone                                | TN          | \$ 65.00          |
| 87                      | Stone Boulder   | TN          | \$ 200.00         |
| 88                      | Sand 2S   | CY          | \$ 60.00          |
| 89                      | Rock Grade Control                                      | EA          | \$ 10,000.00      |
| 90                      | Traffic Control (Single 2-lane road)                    | LS          | \$ 10,000.00      |
| 91                      | Traffic Control (4+ lane road or multiple 2-lane roads) | LS          | \$ 20,000.00      |
| 92                      | Erosion Control (1-2 acre LOD)                          | LS          | \$ 15,000.00      |
| 93                      | Erosion Control (2-5 acre LOD)                          | LS          | \$ 30,000.00      |
| 94                      | Erosion Control (Greater than 5 acre LOD)               | LS          | \$ 50,000.00      |
| 95                      | Erosion Control Matting                                 | SY          | \$ 10.00          |
| 96                      | Fence Removal / Replacement                             | LF          | \$ 50.00          |
| 97                      | 4' Personnel Gates                                      | EA          | \$ 375.00         |
| 98                      | 20' Roadway Gates                                       | EA          | \$ 400.00         |
| 99                      | Soil Media  | CY          | \$ 50.00          |

| <i>Item Description</i> |   | <i>Unit</i> | <i>Unit Price</i> |
|-------------------------|---|-------------|-------------------|
| 100                     | BMP Plantings   | SF          | \$ 2.00           |
| 101                     | Riparian Seed Mix   | SY          | \$ 1.50           |
| 102                     | Live Staking  | SY          | \$ 15.00          |
| 103                     | Seeding and Mulching  | AC          | \$ 7,500.00       |
| 104                     | Wood Retaining Wall (4' high)   | LF          | \$ 100.00         |
| 105                     | Log Grade Control Structure   | EA          | \$ 2,000.00       |
| 106                     | Gabion Wall   | LF          | \$ 300.00         |
| 107                     | Foundation Protection   | EA          | \$ 15,000.00      |
| 108                     | Utility Relocations (Minor Water line adjustments)                          | LS          | \$ 5,000.00       |
| 109                     | Utility Relocations (Substantial Water line adjustments including)          | LS          | \$ 15,000.00      |
| 110                     | Utility Relocations (Substantial sanitary sewer and water line adjustments) | LS          | \$ 30,000.00      |
| 111                     | Buffer Plantings  | SY          | \$ 4.00           |
| 112                     | PICP (Permeable Pavers), 3.5" thick   | SF          | \$ 20.00          |
| 113                     | Hauling   | CY          | \$ 45.00          |
| 114                     | Cascade Boulder   | TN          | \$ 75.00          |
| 115                     | Cobble  | TN          | \$ 75.00          |
| 116                     | RSC Sand/Wood Chip Mixture  | CY          | \$ 45.00          |

## Railroad Crossing (Fork Swamp)

| <i>Item Number</i>  | <i>Item Description</i>              | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|---|--------------------------------------|-------------------|-------------|-------------------|----------------------|
| 1   | Mobilization (10%)                   | 1                 | LS          | \$ 2,500.00       | \$ 2,500.00          |
| 2   | Comprehensive Grading (20%)*         | 1                 | LS          | \$ 4,200.00       | \$ 4,200.00          |
| 3   | Construction Staking (300000-800000) | 1                 | LS          | \$ 6,000.00       | \$ 6,000.00          |
| 4   | Utility Relocations **               | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 5   | Excavation                           | 17232             | CY          | \$ 25.00          | \$ 430,800.00        |
| 6   | Hauling                              | 17232             | CY          | \$ 4.00           | \$ 68,928.00         |
| 7   | Clearing & Grubbing                  | 2.6               | AC          | \$ 5,000.00       | \$ 13,000.00         |
| 8   | 20' Roadway Gates                    | 12584             | SY          | \$ 1.50           | \$ 18,876.00         |
| 9   | Traffic Control (Single 2-lane road) | 1                 | LS          | \$ 30,000.00      | \$ 30,000.00         |
| Subtotal  |                                      |                   |             |                   | \$ 589,300.00        |
| 30% Contingency   |                                      |                   |             |                   | \$176,800.00         |
| <b>Total</b>  |                                      |                   |             |                   | <b>\$ 766,100.00</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs)  |                                      |                   |             |                   | 229,800.00           |
| <b>Total Opinion of Project Cost</b>  |                                      |                   |             |                   | <b>\$ 995,900.00</b> |
| <p>* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.</p> <p>** Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.</p> <p>The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.</p> |                                      |                   |             |                   |                      |

## Evans Street (Fork Swamp)

| <i>Item Number</i> | <i>Item Description</i>                    | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>          |
|--------------------|--|-------------------|-------------|-------------------|------------------------|
| 1                  | Mobilization (10%)                         | 1                 | LS          | \$ 30,400.00      | \$ 30,400.00           |
| 2                  | Comprehensive Grading (20%)*               | 1                 | LS          | \$ 50,600.00      | \$ 50,600.00           |
| 3                  | Construction Staking (Greater than 800000) | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 4                  | Select Material                            | 422               | CY          | \$ 25.00          | \$ 10,550.00           |
| 5                  | 8' x 4' Precast R.C. Box Culvert           | 148               | LF          | \$ 1,200.00       | \$ 177,600.00          |
| 6                  | 4" Concrete Sidewalk                       | 181               | SY          | \$ 55.00          | \$ 9,955.00            |
| 7                  | Drainage Structures, Inlet                 | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00           |
| 8                  | Utility Relocations **                     | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00           |
| 9                  | Excavation                                 | 24535             | CY          | \$ 25.00          | \$ 613,375.00          |
| 10                 | Hauling                                    | 24535             | CY          | \$ 4.00           | \$ 98,140.00           |
| 11                 | Clearing & Grubbing                        | 4.8               | AC          | \$ 5,000.00       | \$ 24,000.00           |
| 12                 | 20' Roadway Gates                          | 23444             | SY          | \$ 1.50           | \$ 35,166.00           |
| 13                 | Traffic Control (Single 2-lane road)       | 1                 | LS          | \$ 30,000.00      | \$ 30,000.00           |
| 14                 | Stone Boulder                              | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| Subtotal           |  |                   |             |                   | \$ 1,134,800.00        |
| 30% Contingency    |  |                   |             |                   | \$ 340,400.00          |
| <b>Total</b>       |  |                   |             |                   | <b>\$ 1,475,200.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 442,600.00

**Total Opinion of Project Cost \$ 1,917,800.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.



## East Fire Tower Road (Fork Swamp)

| <i>Item Number</i> | <i>Item Description</i>                    | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>          |
|--------------------|--|-------------------|-------------|-------------------|------------------------|
| 1                  | Mobilization (10%)                         | 1                 | LS          | \$ 93,500.00      | \$ 93,500.00           |
| 2                  | Comprehensive Grading (20%)*               | 1                 | LS          | \$ 155,800.00     | \$ 155,800.00          |
| 3                  | Construction Staking (Greater than 800000) | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 4                  | Excavation                                 | 26353             | CY          | \$ 25.00          | \$ 658,825.00          |
| 5                  | Hauling                                    | 26353             | CY          | \$ 4.00           | \$ 105,412.00          |
| 6                  | Log Grade Control Structure                | 1                 | LS          | \$ 5,000.00       | \$ 5,000.00            |
| 7                  | Clearing & Grubbing                        | 4                 | AC          | \$ 5,000.00       | \$ 20,000.00           |
| 8                  | Traffic Control (Single 2-lane road)       | 1                 | LS          | \$ 30,000.00      | \$ 30,000.00           |
| 9                  | 20' Roadway Gates                          | 19278             | SY          | \$ 1.50           | \$ 28,917.00           |
| Subtotal           |  |                   |             |                   | \$ 1,028,500.00        |
| 30% Contingency    |  |                   |             |                   | \$ 308,600.00          |
| <b>Total</b>       |  |                   |             |                   | <b>\$ 1,337,100.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 401,100.00

**Total Opinion of Project Cost \$ 1,738,200.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Fork Swamp Main Branch Floodplain Benching

| <i>Item Number</i>   | <i>Item Description</i>                                 | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>          |
|--|---|-------------------|-------------|-------------------|------------------------|
| 1  | Mobilization (10%)                                      | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00            |
| 2  | Comprehensive Grading (20%)*                            | 1                 | LS          | \$ 5,000.00       | \$ 5,000.00            |
| 3  | Construction Staking (Greater than 800000)              | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 4  | Utility Relocations **                                  | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00           |
| 5  | Excavation  | 99505             | CY          | \$ 25.00          | \$ 2,487,625.00        |
| 6  | Hauling   | 99505             | CY          | \$ 4.00           | \$ 398,020.00          |
| 7  | Clearing & Grubbing                                     | 10.8              | AC          | \$ 5,000.00       | \$ 54,000.00           |
| 8  | 20' Roadway Gates                                       | 52272             | SY          | \$ 1.50           | \$ 78,408.00           |
| 9  | Traffic Control (4+ lane road or multiple 2-lane roads) | 1                 | LS          | \$ 50,000.00      | \$ 50,000.00           |
| Subtotal   |   |                   |             |                   | \$ 3,101,100.00        |
| 30% Contingency  |   |                   |             |                   | \$ 930,300.00          |
| <b>Total</b>   |   |                   |             |                   | <b>\$ 4,031,400.00</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |   |                   |             |                   | 1,209,400.00           |
| <b>Total Opinion of Project Cost</b>                                 |   |                   |             |                   | <b>\$ 5,240,800.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Trafalgar Drive - South (FSUT1)

| <i>Item Number</i> | <i>Item Description</i>          | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--------------------|----------------------------------|-------------------|-------------|-------------------|----------------------|
| 1                  | Mobilization (10%)               | 1                 | LS          | \$ 8,200.00       | \$ 8,200.00          |
| 2                  | Comprehensive Grading (20%)*     | 1                 | LS          | \$ 13,600.00      | \$ 13,600.00         |
| 3                  | Construction Staking (0-300000)  | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4                  | Select Material                  | 80                | CY          | \$ 25.00          | \$ 2,000.00          |
| 5                  | 60" R.C. Pipe Culvert, Class III | 62                | LF          | \$ 225.00         | \$ 13,950.00         |
| 6                  | Drainage Structures, Inlet       | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00         |
| 7                  | 4" Concrete Sidewalk             | 61                | SY          | \$ 55.00          | \$ 3,355.00          |
| 8                  | Flared End Section, 42 inch      | 20                | LF          | \$ 35.00          | \$ 700.00            |
| 9                  | Stone Boulder                    | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00         |
| 10                 | Utility Relocations (Minor)**    | 1                 | LS          | \$ 5,000.00       | \$ 5,000.00          |
| 11                 | Rock Grade Control               | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| Subtotal           |                                  |                   |             |                   | \$ 104,800.00        |
| 30% Contingency    |                                  |                   |             |                   | \$ 31,400.00         |
| <b>Total</b>       |                                  |                   |             |                   | <b>\$ 136,200.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 40,900.00

**Total Opinion of Project Cost \$ 177,100.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Trafalgar Drive - North (FSUT1)

| <i>Item Number</i>   | <i>Item Description</i>                 | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|---|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)                      | 1                 | LS          | \$ 22,400.00      | \$ 22,400.00         |
| 2  | Comprehensive Grading (20%)*            | 1                 | LS          | \$ 37,400.00      | \$ 37,400.00         |
| 3  | Construction Staking (300000-800000)    | 1                 | LS          | \$ 6,000.00       | \$ 6,000.00          |
| 4  | Select Material                         | 228               | CY          | \$ 25.00          | \$ 5,700.00          |
| 5  | 8' X 5' Reinforced Concrete Box Culvert | 122               | LF          | \$ 900.00         | \$ 109,800.00        |
| 6  | Drainage Structures, Inlet              | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00         |
| 7  | 4" Concrete Sidewalk                    | 163               | SY          | \$ 55.00          | \$ 8,965.00          |
| 8  | Flared End Section, 42 inch             | 30                | LF          | \$ 35.00          | \$ 1,050.00          |
| 9  | Stone Boulder                           | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00         |
| 10   | Utility Relocations**                   | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 11   | Rock Grade Control                      | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| Subtotal   |   |                   |             |                   | \$ 261,300.00        |
| 30% Contingency  |   |                   |             |                   | \$ 78,400.00         |
| <b>Total</b>   |   |                   |             |                   | <b>\$ 339,700.00</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |   |                   |             |                   | 101,900.00           |
| <b>Total Opinion of Project Cost</b>                                 |   |                   |             |                   | <b>\$ 441,600.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Corey Road (FSUT1)

| <i>Item Number</i> | <i>Item Description</i>                                 | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>          |
|--------------------|---|-------------------|-------------|-------------------|------------------------|
| 1                  | Mobilization (10%)                                      | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 2                  | Comprehensive Grading (20%)*                            | 1                 | LS          | \$ 16,600.00      | \$ 16,600.00           |
| 3                  | Construction Staking (Greater than 800000)              | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 4                  | Select Material   | 125               | CY          | \$ 25.00          | \$ 3,125.00            |
| 5                  | 48" R.C. Pipe Culvert, Class III                        | 110               | LF          | \$ 180.00         | \$ 19,800.00           |
| 6                  | 4" Concrete Sidewalk                                    | 98                | SY          | \$ 55.00          | \$ 5,390.00            |
| 7                  | Drainage Structures, Inlet                              | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00           |
| 8                  | Utility Relocations **                                  | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00           |
| 9                  | Excavation  | 125,143           | CY          | \$ 25.00          | \$ 3,128,575.00        |
| 10                 | Hauling   | 125,143           | CY          | \$ 4.00           | \$ 500,572.00          |
| 11                 | Clearing & Grubbing                                     | 22.4              | AC          | \$ 5,000.00       | \$ 112,000.00          |
| 12                 | 20' Roadway Gates                                       | 108416            | SY          | \$ 1.50           | \$ 162,624.00          |
| 13                 | Traffic Control (4+ lane road or multiple 2-lane roads) | 1                 | LS          | \$ 50,000.00      | \$ 50,000.00           |
| 14                 | Stone Boulder   | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| Subtotal           |   |                   |             |                   | \$ 4,063,700.00        |
| 30% Contingency    |   |                   |             |                   | \$ 1,219,100.00        |
| <b>Total</b>       |   |                   |             |                   | <b>\$ 5,282,800.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 1,584,800.00

**Total Opinion of Project Cost \$ 6,867,600.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Corey Road Regional Detention (FSUT1)

| <i>Item Number</i> | <i>Item Description</i>                                 | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>          |
|--------------------|---|-------------------|-------------|-------------------|------------------------|
| 1                  | Mobilization (10%)                                      | 1                 | LS          | \$ 2,700.00       | \$ 2,700.00            |
| 2                  | Comprehensive Grading (20%)*                            | 1                 | LS          | \$ 4,600.00       | \$ 4,600.00            |
| 3                  | Construction Staking (Greater than 800000)              | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 4                  | Select Material   | 500               | CY          | \$ 25.00          | \$ 12,500.00           |
| 5                  | Excavation  | 158970            | CY          | \$ 25.00          | \$ 3,974,249.35        |
| 6                  | Hauling   | 158970            | CY          | \$ 4.00           | \$ 635,879.90          |
| 7                  | Clearing & Grubbing                                     | 50                | AC          | \$ 5,000.00       | \$ 251,609.46          |
| 8                  | 20' Roadway Gates                                       | 1141              | SY          | \$ 1.50           | \$ 1,711.64            |
| 9                  | Utility Relocations*                                    | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 10                 | Traffic Control (4+ lane road or multiple 2-lane roads) | 1                 | LS          | \$ 50,000.00      | \$ 50,000.00           |
| 11                 | Stone Boulder   | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| Subtotal           |   |                   |             |                   | \$ 4,953,300.00        |
| 30% Contingency    |   |                   |             |                   | \$ 1,486,000.00        |
| <b>Total</b>       |   |                   |             |                   | <b>\$ 6,439,300.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 1,931,800.00

**Total Opinion of Project Cost \$ 8,371,100.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Corey Road Regional Detention - 25 YEAR (FSUT1)

| <i>Item Number</i> | <i>Item Description</i>                                 | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>          |
|--------------------|---|-------------------|-------------|-------------------|------------------------|
| 1                  | Mobilization (10%)                                      | 1                 | LS          | \$ 1,900.00       | \$ 1,900.00            |
| 2                  | Comprehensive Grading (20%)*                            | 1                 | LS          | \$ 3,200.00       | \$ 3,200.00            |
| 3                  | Construction Staking (Greater than 800000)              | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 4                  | Select Material   | 250               | CY          | \$ 25.00          | \$ 6,250.00            |
| 5                  | Excavation  | 47484             | CY          | \$ 25.00          | \$ 1,187,100.75        |
| 6                  | Hauling   | 47484             | CY          | \$ 4.00           | \$ 189,936.12          |
| 7                  | Clearing & Grubbing                                     | 50                | AC          | \$ 5,000.00       | \$ 251,609.46          |
| 8                  | 20' Roadway Gates                                       | 305               | SY          | \$ 1.50           | \$ 457.50              |
| 9                  | Utility Relocations*                                    | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 10                 | Traffic Control (4+ lane road or multiple 2-lane roads) | 1                 | LS          | \$ 50,000.00      | \$ 50,000.00           |
| 11                 | Stone Boulder   | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| Subtotal           |   |                   |             |                   | \$ 1,710,500.00        |
| 30% Contingency    |   |                   |             |                   | \$ 513,200.00          |
| <b>Total</b>       |   |                   |             |                   | <b>\$ 2,223,700.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 667,100.00

**Total Opinion of Project Cost \$ 2,890,800.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

### County Home Road (FSUT3)

| <i>Item Number</i> | <i>Item Description</i>          | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--------------------|----------------------------------|-------------------|-------------|-------------------|----------------------|
| 1                  | Mobilization (10%)               | 1                 | LS          | \$ 8,200.00       | \$ 8,200.00          |
| 2                  | Comprehensive Grading (20%)*     | 1                 | LS          | \$ 13,600.00      | \$ 13,600.00         |
| 3                  | Construction Staking (0-300000)  | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4                  | Select Material                  | 90                | CY          | \$ 25.00          | \$ 2,250.00          |
| 5                  | 42" R.C. Pipe Culvert, Class III | 93                | LF          | \$ 150.00         | \$ 13,950.00         |
| 6                  | 4" Concrete Sidewalk             | 78                | SY          | \$ 55.00          | \$ 4,290.00          |
| 7                  | Drainage Structures, Inlet       | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00         |
| 8                  | Utility Relocations **           | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 9                  | Excavation                       | 646               | CY          | \$ 25.00          | \$ 16,150.00         |
| 10                 | Hauling                          | 646               | CY          | \$ 4.00           | \$ 2,584.00          |
| 11                 | Clearing & Grubbing              | 0.2               | AC          | \$ 5,000.00       | \$ 1,000.00          |
| 12                 | 20' Roadway Gates                | 968               | SY          | \$ 1.50           | \$ 1,452.00          |
| 13                 | Rock Grade Control               | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 14                 | Sand 2S                          | 1                 | LS          | \$ 20,000.00      | \$ 20,000.00         |
| Subtotal           |                                  |                   |             |                   | \$ 126,500.00        |
| 30% Contingency    |                                  |                   |             |                   | \$ 38,000.00         |
| <b>Total</b>       |                                  |                   |             |                   | <b>\$ 164,500.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 49,400.00

**Total Opinion of Project Cost \$ 213,900.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.



### East Fire Tower Road - Upstream (FSUT3)

| <i>Item Number</i> | <i>Item Description</i>                 | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--------------------|---|-------------------|-------------|-------------------|----------------------|
| 1                  | Mobilization (10%)                      | 1                 | LS          | \$ 35,200.00      | \$ 35,200.00         |
| 2                  | Comprehensive Grading (20%)*            | 1                 | LS          | \$ 58,600.00      | \$ 58,600.00         |
| 3                  | Construction Staking (300000-800000)    | 1                 | LS          | \$ 6,000.00       | \$ 6,000.00          |
| 4                  | Select Material                         | 386               | CY          | \$ 25.00          | \$ 9,650.00          |
| 5                  | 6' X 6' Reinforced Concrete Box Culvert | 266               | LF          | \$ 750.00         | \$ 199,500.00        |
| 6                  | Drainage Structures, Inlet              | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00         |
| 7                  | 4" Concrete Sidewalk                    | 236               | SY          | \$ 55.00          | \$ 12,980.00         |
| 8                  | Sand 2S                                 | 1                 | LS          | \$ 20,000.00      | \$ 20,000.00         |
| 9                  | Utility Relocations**                   | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 10                 | Rock Grade Control                      | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| Subtotal           |   |                   |             |                   | \$ 401,900.00        |
| 30% Contingency    |   |                   |             |                   | \$120,600.00         |
| <b>Total</b>       |   |                   |             |                   | <b>\$ 522,500.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 156,800.00  
**Total Opinion of Project Cost \$ 679,300.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

### Wimbledon Drive (FSUT3)

| <i>Item Number</i>   | <i>Item Description</i>              | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|--------------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)                   | 1                 | LS          | \$ 28,600.00      | \$ 28,600.00         |
| 2  | Comprehensive Grading (20%)*         | 1                 | LS          | \$ 47,800.00      | \$ 47,800.00         |
| 3  | Construction Staking (300000-800000) | 1                 | LS          | \$ 6,000.00       | \$ 6,000.00          |
| 4  | Select Material                      | 305               | CY          | \$ 25.00          | \$ 7,625.00          |
| 5  | 10 x 5' Precast R.C. Box Culvert     | 140               | LF          | \$ 1,200.00       | \$ 168,000.00        |
| 6  | 4" Concrete Sidewalk                 | 218               | SY          | \$ 55.00          | \$ 11,990.00         |
| 7  | Drainage Structures, Inlet           | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00         |
| 8  | Utility Relocations **               | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 9  | Excavation                           | 975               | CY          | \$ 25.00          | \$ 24,375.00         |
| 10   | Hauling                              | 975               | CY          | \$ 4.00           | \$ 3,900.00          |
| 11   | Clearing & Grubbing                  | 0.4               | AC          | \$ 5,000.00       | \$ 2,000.00          |
| 12   | 20' Roadway Gates                    | 1936              | SY          | \$ 1.50           | \$ 2,904.00          |
| 13   | Rock Grade Control                   | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 14   | Stone Boulder                        | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00         |
| Subtotal   |                                      |                   |             |                   | \$ 363,200.00        |
| 30% Contingency  |                                      |                   |             |                   | \$ 109,000.00        |
| <b>Total</b>   |                                      |                   |             |                   | <b>\$ 472,200.00</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                      |                   |             |                   | 141,700.00           |
| <b>Total Opinion of Project Cost</b>                                 |                                      |                   |             |                   | <b>\$ 613,900.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Tower Place (FSUT3)

| <i>Item Number</i>   | <i>Item Description</i>              | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|--------------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)                   | 1                 | LS          | \$ 33,000.00      | \$ 33,000.00         |
| 2  | Comprehensive Grading (20%)*         | 1                 | LS          | \$ 55,000.00      | \$ 55,000.00         |
| 3  | Construction Staking (300000-800000) | 1                 | LS          | \$ 6,000.00       | \$ 6,000.00          |
| 4  | Select Material                      | 348               | CY          | \$ 25.00          | \$ 8,700.00          |
| 5  | 10 x 5' Precast R.C. Box Culvert     | 160               | LF          | \$ 1,200.00       | \$ 192,000.00        |
| 6  | Drainage Structures, Inlet           | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00         |
| 7  | 4" Concrete Sidewalk                 | 249               | SY          | \$ 55.00          | \$ 13,695.00         |
| 8  | Stone Boulder                        | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00         |
| 9  | Utility Relocations**                | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 10   | Rock Grade Control                   | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| Subtotal   |                                      |                   |             |                   | \$ 378,400.00        |
| 30% Contingency  |                                      |                   |             |                   | \$113,500.00         |
| <b>Total</b>   |                                      |                   |             |                   | <b>\$ 491,900.00</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                      |                   |             |                   | 147,600.00           |
| <b>Total Opinion of Project Cost</b>                                 |                                      |                   |             |                   | <b>\$ 639,500.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

### Summerhaven Drive (FSUT3)

| <i>Item Number</i> | <i>Item Description</i>                 | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--------------------|---|-------------------|-------------|-------------------|----------------------|
| 1                  | Mobilization (10%)                      | 1                 | LS          | \$ 30,900.00      | \$ 30,900.00         |
| 2                  | Comprehensive Grading (20%)*            | 1                 | LS          | \$ 51,400.00      | \$ 51,400.00         |
| 3                  | Construction Staking (300000-800000)    | 1                 | LS          | \$ 6,000.00       | \$ 6,000.00          |
| 4                  | Select Material                         | 334               | CY          | \$ 25.00          | \$ 8,350.00          |
| 5                  | 6' X 6' Reinforced Concrete Box Culvert | 248               | LF          | \$ 750.00         | \$ 186,000.00        |
| 6                  | 4" Concrete Sidewalk                    | 220               | SY          | \$ 55.00          | \$ 12,100.00         |
| 7                  | Drainage Structures, Inlet              | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00         |
| 8                  | Utility Relocations **                  | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 9                  | Excavation                              | 830               | CY          | \$ 25.00          | \$ 20,750.00         |
| 10                 | Hauling                                 | 830               | CY          | \$ 4.00           | \$ 3,320.00          |
| 11                 | Clearing & Grubbing                     | 0.5               | AC          | \$ 5,000.00       | \$ 2,500.00          |
| 12                 | 20' Roadway Gates                       | 2420              | SY          | \$ 1.50           | \$ 3,630.00          |
| 13                 | Rock Grade Control                      | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 14                 | Stone Boulder                           | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00         |
| Subtotal           |   |                   |             |                   | \$ 385,000.00        |
| 30% Contingency    |   |                   |             |                   | \$115,500.00         |
| <b>Total</b>       |   |                   |             |                   | <b>\$ 500,500.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 150,200.00  
**Total Opinion of Project Cost \$ 650,700.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

### East Fire Tower Road - Downstream (FSUT3)

| <i>Item Number</i> | <i>Item Description</i>                                 | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>          |
|--------------------|---|-------------------|-------------|-------------------|------------------------|
| 1                  | Mobilization (10%)                                      | 1                 | LS          | \$ 70,700.00      | \$ 70,700.00           |
| 2                  | Comprehensive Grading (20%)*                            | 1                 | LS          | \$ 117,800.00     | \$ 117,800.00          |
| 3                  | Construction Staking (300000-800000)                    | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 4                  | Select Material   | 942               | CY          | \$ 25.00          | \$ 23,550.00           |
| 5                  | 6' X 7' Reinforced Concrete Box Culverts                | 568               | LF          | \$ 850.00         | \$ 482,800.00          |
| 6                  | 4" Concrete Sidewalk                                    | 505               | SY          | \$ 55.00          | \$ 27,775.00           |
| 7                  | Drainage Structures, Inlet                              | 2                 | EA          | \$ 15,000.00      | \$ 30,000.00           |
| 8                  | Utility Relocations **                                  | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00           |
| 9                  | Excavation  | 50045             | CY          | \$ 25.00          | \$ 1,251,125.00        |
| 10                 | Hauling   | 50045             | CY          | \$ 4.00           | \$ 200,180.00          |
| 11                 | Clearing & Grubbing                                     | 7.12              | AC          | \$ 5,000.00       | \$ 35,600.00           |
| 12                 | 20' Roadway Gates                                       | 34461             | SY          | \$ 1.50           | \$ 51,691.20           |
| 13                 | Traffic Control (4+ lane road or multiple 2-lane roads) | 1                 | LS          | \$ 50,000.00      | \$ 50,000.00           |
| 14                 | Sand 2S   | 1                 | LS          | \$ 20,000.00      | \$ 20,000.00           |
| Subtotal           |   |                   |             |                   | \$ 2,366,200.00        |
| 30% Contingency    |   |                   |             |                   | \$ 709,900.00          |
| <b>Total</b>       |   |                   |             |                   | <b>\$ 3,076,100.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 922,800.00

**Total Opinion of Project Cost \$ 3,998,900.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

### Corey Road Open/Closed System (FSUT3)

| Item Number  | Item Description                                      | Quantities | Unit | Unit Price   | Amount               |
|--|---|------------|------|--------------|----------------------|
| 1  | Mobilization (10%)                                    | 1          | LS   | \$ 19,700.00 | \$ 19,700.00         |
| 2  | Comprehensive Grading (20%)*                          | 1          | LS   | \$ 32,800.00 | \$ 32,800.00         |
| 3  | Construction Staking (0-300000)                       | 1          | LS   | \$ 3,000.00  | \$ 3,000.00          |
| 4  | Select Material                                       | 250        | CY   | \$ 25.00     | \$ 6,250.00          |
| 5  | 24" R.C. Pipe Culvert, Class IV                       | 83         | LF   | \$ 75.00     | \$ 6,225.00          |
| 6  | 30" R.C. Pipe Culvert, Class IV, 0' - 6' depth        | 98         | LF   | \$ 100.00    | \$ 9,800.00          |
| 7  | 48" R.C. Pipe Culvert, Class III                      | 294        | LF   | \$ 180.00    | \$ 52,920.00         |
| 8  | Drainage Structures, DOT Standard Endwall             | 6          | EA   | \$ 6,000.00  | \$ 36,000.00         |
| 9  | 11' x 7' Precast R.C. Box Culvert                     | 1          | EA   | \$ 3,000.00  | \$ 3,000.00          |
| 10   | Asphalt Replacement (Surface, Base Course, & Milling) | 46         | SY   | \$ 55.00     | \$ 2,530.00          |
| 11   | Flared End Section, 42 inch                           | 40         | LF   | \$ 35.00     | \$ 1,400.00          |
| 12   | Rip Rap Stone, Class 1                                | 205        | TN   | \$ 65.00     | \$ 13,314.84         |
| 13   | Stone Boulder   | 1          | LS   | \$ 10,000.00 | \$ 10,000.00         |
| 14   | Rock Grade Control                                    | 1          | LS   | \$ 15,000.00 | \$ 15,000.00         |
| 15   | Log Grade Control Structure                           | 1          | LS   | \$ 5,000.00  | \$ 5,000.00          |
| Subtotal   |   |            |      |              | \$ 216,900.00        |
| 30% Contingency  |   |            |      |              | \$65,100.00          |
| <b>Total</b>   |   |            |      |              | <b>\$ 282,000.00</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |   |            |      |              | 84,600.00            |
| <b>Total Opinion of Project Cost</b>                                 |   |            |      |              | <b>\$ 366,600.00</b> |

disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

### Lynndale Closed System Phase I (FSUT3)

| Item Number     | Item Description   | Quantities | Unit | Unit Price   | Amount               |
|-----------------|--|------------|------|--------------|----------------------|
| 1               | Mobilization (10%)   | 1          | LS   | \$ 54,300.00 | \$ 54,300.00         |
| 2               | Comprehensive Grading (20%)*   | 1          | LS   | \$ 90,400.00 | \$ 90,400.00         |
| 3               | Construction Staking (Greater than 800000)                           | 1          | LS   | \$ 10,000.00 | \$ 10,000.00         |
| 4               | Select Material  | 500        | CY   | \$ 25.00     | \$ 12,500.00         |
| 5               | 15" R.C. Pipe Culvert, Class III                                     | 130        | LF   | \$ 50.00     | \$ 6,500.00          |
| 6               | 18" R.C. Pipe Culvert, Class IV                                      | 954        | LF   | \$ 60.00     | \$ 57,240.00         |
| 7               | 18" PVC Pipe, SDR 35   | 197        | LF   | \$ 25.00     | \$ 4,925.00          |
| 8               | 24" R.C. Pipe Culvert, Class IV                                      | 107        | LF   | \$ 75.00     | \$ 8,025.00          |
| 9               | 24" PVC Pipe, SDR 35   | 203        | LF   | \$ 28.00     | \$ 5,684.00          |
| 10              | 66" R.C. Pipe Culverts, Class III                                    | 200        | LF   | \$ 260.00    | \$ 52,000.00         |
| 11              | 72" R.C. Pipe Culvert, Class III                                     | 26         | LF   | \$ 320.00    | \$ 8,320.00          |
| 12              | 78" R.C. Pipe Culvert, Class III                                     | 168        | LF   | \$ 350.00    | \$ 58,800.00         |
| 13              | Convert Yard Inlet to Junction Box                                   | 2          | EA   | \$ 1,000.00  | \$ 2,000.00          |
| 14              | Flared End Section, 48 inch  | 2          | EA   | \$ 3,000.00  | \$ 6,000.00          |
| 15              | Drainage Structures, Manhole   | 2          | EA   | \$ 6,000.00  | \$ 12,000.00         |
| 16              | 11' x 7' Precast R.C. Box Culvert                                    | 24         | EA   | \$ 3,000.00  | \$ 72,000.00         |
| 17              | Asphalt Replacement (Surface, Base Course, & Milling)                | 315        | SY   | \$ 55.00     | \$ 17,328.40         |
| 18              | Flared End Section, 42 inch  | 1109       | LF   | \$ 35.00     | \$ 38,815.00         |
| 19              | Rip Rap Stone, Class 1   | 447        | TN   | \$ 65.00     | \$ 29,055.00         |
| 20              | Asphalt Replacement (Surface, Base Course, & Milling)                | 80         | TN   | \$ 70.00     | \$ 5,600.00          |
| 21              | Asphalt Milling/Overlay  | 85         | TN   | \$ 65.00     | \$ 5,525.00          |
| 22              | Stone Boulder  | 1          | LS   | \$ 10,000.00 | \$ 10,000.00         |
| 23              | Rock Grade Control   | 1          | LS   | \$ 15,000.00 | \$ 15,000.00         |
| 24              | Utility Relocations (Substantial Water line adjustments including)** | 1          | LS   | \$ 15,000.00 | \$ 15,000.00         |
| Subtotal        |  |            |      |              | \$ 597,000.00        |
| 30% Contingency |  |            |      |              | \$ 179,100.00        |
| <b>Total</b>    |  |            |      |              | <b>\$ 776,100.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 232,800.00

**Total Opinion of Project Cost \$ 1,008,900.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

### Lynndale Closed System Phase II (FSUT3)

| Item Number | Item Description   | Quantities | Unit | Unit Price      | Amount                 |
|-------------|--|------------|------|-----------------|------------------------|
| 1           | Mobilization (10%)   | 1          | LS   | \$ 183,900.00   | \$ 183,900.00          |
| 2           | Comprehensive Grading (20%)*   | 1          | LS   | \$ 306,600.00   | \$ 306,600.00          |
| 3           | Construction Staking (Greater than 800000)                           | 1          | LS   | \$ 10,000.00    | \$ 10,000.00           |
| 4           | Select Material  | 500        | CY   | \$ 25.00        | \$ 12,500.00           |
| 5           | 15" R.C. Pipe Culvert, Class III                                     | 637        | LF   | \$ 50.00        | \$ 31,850.00           |
| 6           | 18" R.C. Pipe Culvert, Class IV                                      | 796        | LF   | \$ 60.00        | \$ 47,760.00           |
| 7           | 24" R.C. Pipe Culvert, Class IV                                      | 1685       | LF   | \$ 75.00        | \$ 126,375.00          |
| 8           | 30" R.C. Pipe Culvert, Class IV, 0' - 6' depth                       | 447        | LF   | \$ 100.00       | \$ 44,700.00           |
| 9           | 36" R.C. Pipe Culvert, Class IV                                      | 152        | LF   | \$ 130.00       | \$ 19,760.00           |
| 10          | 42" R.C. Pipe Culvert, Class IV                                      | 626        | LF   | \$ 165.00       | \$ 103,290.00          |
| 11          | 48" R.C. Pipe Culvert, Class IV                                      | 646        | LF   | \$ 195.00       | \$ 125,970.00          |
| 12          | 54" R.C. Pipe Culvert, Class III                                     | 870        | LF   | \$ 200.00       | \$ 174,000.00          |
| 13          | 60" R.C. Pipe Culvert, Class III                                     | 367        | LF   | \$ 225.00       | \$ 82,575.00           |
| 14          | 66" R.C. Pipe Culverts, Class III                                    | 160        | LF   | \$ 260.00       | \$ 41,600.00           |
| 15          | Drainage Structures, Manhole   | 1          | EA   | \$ 6,000.00     | \$ 6,000.00            |
| 16          | 11' x 7' Precast R.C. Box Culvert                                    | 71         | EA   | \$ 3,000.00     | \$ 213,000.00          |
| 17          | 11' x 6' Precast R.C. Box Culvert                                    | 4          | EA   | \$ 3,500.00     | \$ 14,000.00           |
| 18          | Flared End Section, 36 inch  | 4          | EA   | \$ 15,000.00    | \$ 60,000.00           |
| 19          | Asphalt Replacement (Surface, Base Course, & Milling)                | 1447       | SY   | \$ 55.00        | \$ 79,566.67           |
| 20          | Flared End Section, 42 inch  | 5859       | LF   | \$ 35.00        | \$ 205,065.00          |
| 21          | Rip Rap Stone, Class 1   | 1197       | TN   | \$ 65.00        | \$ 77,829.38           |
| 22          | Asphalt Replacement (Surface, Base Course, & Milling)                | 25         | TN   | \$ 70.00        | \$ 1,750.00            |
| 23          | Stone Boulder  | 1          | LS   | \$ 10,000.00    | \$ 10,000.00           |
| 24          | Traffic Control (Single 2-lane road)                                 | 1          | LS   | \$ 30,000.00    | \$ 30,000.00           |
| 25          | Utility Relocations (Substantial Water line adjustments including)** | 1          | LS   | \$ 15,000.00    | \$ 15,000.00           |
|             |  |            |      | Subtotal        | \$ 2,023,100.00        |
|             |  |            |      | 30% Contingency | \$606,900.00           |
|             |  |            |      | <b>Total</b>    | <b>\$ 2,630,000.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 789,000.00  
**Total Opinion of Project Cost \$ 3,419,000.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.



### Lynndale Closed System Phase III (FSUT3)

| <i>Item Number</i> | <i>Item Description</i>  | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>          |
|--------------------|--|-------------------|-------------|-------------------|------------------------|
| 1                  | Mobilization (10%)   | 1                 | LS          | \$ 148,100.00     | \$ 148,100.00          |
| 2                  | Comprehensive Grading (20%)*   | 1                 | LS          | \$ 246,800.00     | \$ 246,800.00          |
| 3                  | Construction Staking (Greater than 800000)                           | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 4                  | Select Material  | 500               | CY          | \$ 25.00          | \$ 12,500.00           |
| 5                  | Flowable Fill  | 22                | CY          | \$ 500.00         | \$ 11,028.30           |
| 6                  | 15" R.C. Pipe Culvert, Class III                                     | 832               | LF          | \$ 50.00          | \$ 41,600.00           |
| 7                  | 18" R.C. Pipe Culvert, Class IV                                      | 961               | LF          | \$ 60.00          | \$ 57,660.00           |
| 8                  | 24" R.C. Pipe Culvert, Class IV                                      | 902               | LF          | \$ 75.00          | \$ 67,650.00           |
| 9                  | 30" R.C. Pipe Culvert, Class IV, 0' - 6' depth                       | 736               | LF          | \$ 100.00         | \$ 73,600.00           |
| 10                 | 36" R.C. Pipe Culvert, Class IV                                      | 110               | LF          | \$ 130.00         | \$ 14,300.00           |
| 11                 | 42" R.C. Pipe Culvert, Class IV                                      | 916               | LF          | \$ 165.00         | \$ 151,140.00          |
| 12                 | 48" R.C. Pipe Culvert, Class IV                                      | 1051              | LF          | \$ 195.00         | \$ 204,945.00          |
| 13                 | 11' x 7' Precast R.C. Box Culvert                                    | 57                | EA          | \$ 3,000.00       | \$ 171,000.00          |
| 14                 | 11' x 6' Precast R.C. Box Culvert                                    | 8                 | EA          | \$ 3,500.00       | \$ 28,000.00           |
| 15                 | Asphalt Replacement (Surface, Base Course, & Milling)                | 1360              | SY          | \$ 55.00          | \$ 74,800.00           |
| 16                 | Flared End Section, 42 inch  | 5508              | LF          | \$ 35.00          | \$ 192,780.00          |
| 17                 | Rip Rap Stone, Class 1   | 1033              | TN          | \$ 65.00          | \$ 67,128.75           |
| 18                 | Asphalt Milling/Overlay  | 20                | TN          | \$ 65.00          | \$ 1,300.00            |
| 19                 | Stone Boulder  | 1                 | LS          | \$ 10,000.00      | \$ 10,000.00           |
| 20                 | Traffic Control (Single 2-lane road)                                 | 1                 | LS          | \$ 30,000.00      | \$ 30,000.00           |
| 21                 | Utility Relocations (Substantial Water line adjustments including)** | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00           |
| Subtotal           |  |                   |             |                   | \$ 1,629,300.00        |
| 30% Contingency    |  |                   |             |                   | \$ 488,800.00          |
| <b>Total</b>       |  |                   |             |                   | <b>\$ 2,118,100.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 635,400.00

**Total Opinion of Project Cost \$ 2,753,500.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

\*\* Cost for utility conflicts includes all utilities that need to be moved including sanitary sewer and potable water lines. Additional survey may be required to locate pressurized utilities.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Stream Stabilization Project #1 -Live Oak Lane

| <i>Item Number</i> | <i>Item Description</i>         | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--------------------|---------------------------------|-------------------|-------------|-------------------|----------------------|
| 1                  | Mobilization (10%)              | 1                 | LS          | \$ 14,804.00      | \$ 14,804.00         |
| 2                  | Comprehensive Grading*          | 1                 | LS          | \$ 24,600.00      | \$ 24,600.00         |
| 3                  | Construction Staking (0-300000) | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4                  | Channel Grading                 | 1890              | SY          | \$ 15.00          | \$ 28,350.00         |
| 5                  | Erosion Control Matting         | 1890              | SY          | \$ 10.00          | \$ 18,900.00         |
| 6                  | Live Staking                    | 1890              | SY          | \$ 15.00          | \$ 28,350.00         |
| 7                  | Riparian Seed Mix               | 1890              | SY          | \$ 1.50           | \$ 2,835.00          |
| 8                  | Rock Grade Control              | 2                 | EA          | \$ 10,000.00      | \$ 20,000.00         |
| 9                  | Rip Rap Stone, Class 1          | 100               | TN          | \$ 70.00          | \$ 7,000.00          |
| 10                 | Rock Grade Control              | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| Subtotal           |                                 |                   |             |                   | \$ 162,800.00        |
| 30% Contingency    |                                 |                   |             |                   | \$ 48,800.00         |
| <b>Total</b>       |                                 |                   |             |                   | <b>\$ 211,600.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 63,500.00

**Total Opinion of Project Cost \$ 275,100.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Stream Stabilization Project #2 - Corey Road

| <i>Item Number</i>   | <i>Item Description</i>              | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|--------------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)                   | 1                 | LS          | \$ 31,660.00      | \$ 31,660.00         |
| 2  | Comprehensive Grading*               | 1                 | LS          | \$ 52,800.00      | \$ 52,800.00         |
| 3  | Construction Staking (300000-800000) | 1                 | LS          | \$ 6,000.00       | \$ 6,000.00          |
| 4  | Channel Grading                      | 4970              | SY          | \$ 15.00          | \$ 74,550.00         |
| 5  | Erosion Control Matting              | 4970              | SY          | \$ 10.00          | \$ 49,700.00         |
| 6  | Live Staking                         | 1210              | SY          | \$ 15.00          | \$ 18,150.00         |
| 7  | Buffer Plantings                     | 16111             | SY          | \$ 4.00           | \$ 64,444.44         |
| 8  | Riparian Seed Mix                    | 4970              | SY          | \$ 1.50           | \$ 7,455.00          |
| 9  | Rock Grade Control                   | 1                 | EA          | \$ 10,000.00      | \$ 10,000.00         |
| 10   | Rip Rap Stone, Class 1               | 150               | TN          | \$ 70.00          | \$ 10,500.00         |
| 11   | Log Grade Control Structure          | 4                 | EA          | \$ 2,000.00       | \$ 8,000.00          |
| 12   | Rock Grade Control                   | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| Subtotal   |                                      |                   |             |                   | \$ 348,300.00        |
| 30% Contingency  |                                      |                   |             |                   | \$104,500.00         |
| <b>Total</b>   |                                      |                   |             |                   | <b>\$ 452,800.00</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                      |                   |             |                   | 135,800.00           |
| <b>Total Opinion of Project Cost</b>                                 |                                      |                   |             |                   | <b>\$ 588,600.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

### Stream Stabilization Project #3- East Fire Tower Road

| <i>Item Number</i> | <i>Item Description</i>         | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--------------------|---------------------------------|-------------------|-------------|-------------------|----------------------|
| 1                  | Mobilization (10%)              | 1                 | LS          | \$ 12,193.00      | \$ 12,193.00         |
| 2                  | Comprehensive Grading*          | 1                 | LS          | \$ 20,400.00      | \$ 20,400.00         |
| 3                  | Construction Staking (0-300000) | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4                  | Channel Grading                 | 1740              | SY          | \$ 15.00          | \$ 26,100.00         |
| 5                  | Erosion Control Matting         | 1740              | SY          | \$ 10.00          | \$ 17,400.00         |
| 6                  | Live Staking                    | 780               | SY          | \$ 15.00          | \$ 11,700.00         |
| 7                  | Buffer Plantings                | 5556              | SY          | \$ 4.00           | \$ 22,222.22         |
| 8                  | Riparian Seed Mix               | 1740              | SY          | \$ 1.50           | \$ 2,610.00          |
| 9                  | Rip Rap Stone, Class 1          | 50                | TN          | \$ 70.00          | \$ 3,500.00          |
| 10                 | Rock Grade Control              | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| Subtotal           |                                 |                   |             |                   | \$ 134,100.00        |
| 30% Contingency    |                                 |                   |             |                   | \$ 40,200.00         |
| <b>Total</b>       |                                 |                   |             |                   | <b>\$ 174,300.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 52,300.00

**Total Opinion of Project Cost \$ 226,600.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Stream Stabilization Project #4- Tower Place

| <i>Item Number</i> | <i>Item Description</i>         | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--------------------|---------------------------------|-------------------|-------------|-------------------|----------------------|
| 1                  | Mobilization (10%)              | 1                 | LS          | \$ 7,313.00       | \$ 7,313.00          |
| 2                  | Comprehensive Grading*          | 1                 | LS          | \$ 12,200.00      | \$ 12,200.00         |
| 3                  | Construction Staking (0-300000) | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4                  | Channel Grading                 | 950               | SY          | \$ 15.00          | \$ 14,250.00         |
| 5                  | Erosion Control Matting         | 950               | SY          | \$ 10.00          | \$ 9,500.00          |
| 6                  | Live Staking                    | 950               | SY          | \$ 15.00          | \$ 14,250.00         |
| 7                  | Riparian Seed Mix               | 950               | SY          | \$ 1.50           | \$ 1,425.00          |
| 8                  | Rip Rap Stone, Class 1          | 50                | TN          | \$ 70.00          | \$ 3,500.00          |
| 9                  | Rock Grade Control              | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| Subtotal           |                                 |                   |             |                   | \$ 80,400.00         |
| 30% Contingency    |                                 |                   |             |                   | \$24,100.00          |
| <b>Total</b>       |                                 |                   |             |                   | <b>\$ 104,500.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 31,400.00

**Total Opinion of Project Cost \$ 135,900.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Stream Stabilization Project #5 -Charles Boulevard

| <i>Item Number</i> | <i>Item Description</i>         | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>       |
|--------------------|---------------------------------|-------------------|-------------|-------------------|---------------------|
| 1                  | Mobilization (10%)              | 1                 | LS          | \$ 4,890.00       | \$ 4,890.00         |
| 2                  | Comprehensive Grading*          | 1                 | LS          | \$ 8,200.00       | \$ 8,200.00         |
| 3                  | Construction Staking (0-300000) | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00         |
| 4                  | Channel Grading                 | 480               | SY          | \$ 15.00          | \$ 7,200.00         |
| 5                  | Erosion Control Matting         | 480               | SY          | \$ 10.00          | \$ 4,800.00         |
| 6                  | Live Staking                    | 480               | SY          | \$ 15.00          | \$ 7,200.00         |
| 7                  | Rip Rap Stone, Class 1          | 50                | TN          | \$ 70.00          | \$ 3,500.00         |
| 8                  | Rock Grade Control              | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00        |
| Subtotal           |                                 |                   |             |                   | \$ 53,800.00        |
| 30% Contingency    |                                 |                   |             |                   | \$ 16,100.00        |
| <b>Total</b>       |                                 |                   |             |                   | <b>\$ 69,900.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 21,000.00

**Total Opinion of Project Cost \$ 90,900.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Stream Stabilization Project #6 -Queen Annes Road

| <i>Item Number</i> | <i>Item Description</i>         | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--------------------|---------------------------------|-------------------|-------------|-------------------|----------------------|
| 1                  | Mobilization (10%)              | 1                 | LS          | \$ 11,875.00      | \$ 11,875.00         |
| 2                  | Comprehensive Grading*          | 1                 | LS          | \$ 19,800.00      | \$ 19,800.00         |
| 3                  | Construction Staking (0-300000) | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4                  | Channel Grading                 | 1300              | SY          | \$ 15.00          | \$ 19,500.00         |
| 5                  | Erosion Control Matting         | 1300              | SY          | \$ 10.00          | \$ 13,000.00         |
| 6                  | Live Staking                    | 1300              | SY          | \$ 15.00          | \$ 19,500.00         |
| 7                  | Riparian Seed Mix               | 1300              | SY          | \$ 1.50           | \$ 1,950.00          |
| 8                  | Rock Grade Control              | 2                 | EA          | \$ 10,000.00      | \$ 20,000.00         |
| 9                  | Rip Rap Stone, Class 1          | 100               | TN          | \$ 70.00          | \$ 7,000.00          |
| 10                 | Rock Grade Control              | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| Subtotal           |                                 |                   |             |                   | \$ 130,600.00        |
| 30% Contingency    |                                 |                   |             |                   | \$ 39,200.00         |
| <b>Total</b>       |                                 |                   |             |                   | <b>\$ 169,800.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 50,900.00

**Total Opinion of Project Cost \$ 220,700.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.

## Stream Stabilization Project #7 -Evans Street

| <i>Item Number</i> | <i>Item Description</i>         | <i>Quantities</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>       |
|--------------------|---------------------------------|-------------------|-------------|-------------------|---------------------|
| 1                  | Mobilization (10%)              | 1                 | LS          | \$ 6,733.00       | \$ 6,733.00         |
| 2                  | Comprehensive Grading*          | 1                 | LS          | \$ 11,200.00      | \$ 11,200.00        |
| 3                  | Construction Staking (0-300000) | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00         |
| 4                  | Channel Grading                 | 750               | SY          | \$ 15.00          | \$ 11,250.00        |
| 5                  | Erosion Control Matting         | 750               | SY          | \$ 10.00          | \$ 7,500.00         |
| 6                  | Live Staking                    | 750               | SY          | \$ 15.00          | \$ 11,250.00        |
| 7                  | Riparian Seed Mix               | 750               | SY          | \$ 1.50           | \$ 1,125.00         |
| 8                  | Rip Rap Stone, Class 1          | 100               | TN          | \$ 70.00          | \$ 7,000.00         |
| 9                  | Rock Grade Control              | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00        |
| Subtotal           |                                 |                   |             |                   | \$ 74,100.00        |
| 30% Contingency    |                                 |                   |             |                   | \$22,200.00         |
| <b>Total</b>       |                                 |                   |             |                   | <b>\$ 96,300.00</b> |

Design, Administration, Fiscal and Legal (30% of Construction Costs) 28,900.00

**Total Opinion of Project Cost \$ 125,200.00**

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.



**Cromwell Drive Bioretention Pond  
Preliminary Opinion of Probable Construction Cost**

| <i>Item Description</i>  |   | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|---|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)                                    | 1                 | LS          | \$ 18,560.00      | \$ 18,560.00         |
| 2  | Comprehensive Grading (20%)                           | 1                 | LS          | \$ 31,000.00      | \$ 31,000.00         |
| 3  | Erosion Control (1-2 acre LOD)                        | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 4  | Excavation  | 1389              | CY          | \$ 25.00          | \$ 34,722.22         |
| 5  | Hauling   | 1389              | CY          | \$ 4.00           | \$ 5,555.56          |
| 6  | Soil Media  | 1389              | CY          | \$ 50.00          | \$ 69,444.44         |
| 7  | Construction Staking (0-300000)                       | 1                 | EA          | \$ 3,000.00       | \$ 3,000.00          |
| 8  | BMP Plantings   | 7500              | SF          | \$ 2.00           | \$ 15,000.00         |
| 9  | Seeding and Mulching                                  | 0.17              | AC          | \$ 7,500.00       | \$ 1,291.32          |
| 10   | 18" R.C. Pipe Culvert, Class III                      | 50                | LF          | \$ 55.00          | \$ 2,750.00          |
| 11   | Flared End Section, 18 inch                           | 1                 | EA          | \$ 1,000.00       | \$ 1,000.00          |
| 12   | Drainage Structures, Inlet                            | 1                 | EA          | \$ 3,000.00       | \$ 3,000.00          |
| 13   | Asphalt Replacement (Surface, Base Course, & Milling) | 44.4              | SY          | \$ 55.00          | \$ 2,442.00          |
| 14   | Concrete Curb and Gutter                              | 40                | LF          | \$ 35.00          | \$ 1,400.00          |
| Subtotal   |   |                   |             |                   | \$ 204,165.54        |
| 30% Contingency  |   |                   |             |                   | \$ 61,200.00         |
| <b>Total</b>   |   |                   |             |                   | <b>\$ 265,365.54</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |   |                   |             |                   | \$ 79,600.00         |
| <b>Total Opinion of Project Cost</b>                                 |   |                   |             |                   | <b>\$ 345,000.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

**H. Boyd Lee Park Bioretention**  
**Preliminary Opinion of Probable Construction Cost**

| <i>Item Description</i>  |                                  | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> |           | <i>Amount</i>        |
|--|----------------------------------|-------------------|-------------|-------------------|-----------|----------------------|
| 1  | Mobilization (10%)               | 1                 | LS          | \$                | 18,440.00 | \$ 18,440.00         |
| 2  | Comprehensive Grading (20%)      | 1                 | LS          | \$                | 30,800.00 | \$ 30,800.00         |
| 3  | Erosion Control (1-2 acre LOD)   | 1                 | LS          | \$                | 15,000.00 | \$ 15,000.00         |
| 4  | Excavation                       | 1389              | CY          | \$                | 25.00     | \$ 34,722.22         |
| 5  | Hauling                          | 1389              | CY          | \$                | 4.00      | \$ 5,555.56          |
| 6  | Soil Media                       | 1389              | CY          | \$                | 50.00     | \$ 69,444.44         |
| 7  | Construction Staking (0-300000)  | 1                 | EA          | \$                | 3,000.00  | \$ 3,000.00          |
| 8  | BMP Plantings                    | 7500              | SF          | \$                | 2.00      | \$ 15,000.00         |
| 9  | Seeding and Mulching             | 0.2               | AC          | \$                | 7,500.00  | \$ 1,291.32          |
| 10   | 24" R.C. Pipe Culvert, Class III | 65                | LF          | \$                | 70.00     | \$ 4,550.00          |
| 11   | Flared End Section, 24 inch      | 1                 | EA          | \$                | 2,000.00  | \$ 2,000.00          |
| 12   | Drainage Structures, Inlet       | 1                 | EA          | \$                | 3,000.00  | \$ 3,000.00          |
| Subtotal   |                                  |                   |             |                   |           | \$ 202,803.54        |
| 30% Contingency  |                                  |                   |             |                   |           | \$ 60,800.00         |
| <b>Total</b>   |                                  |                   |             |                   |           | <b>\$ 263,603.54</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                  |                   |             |                   |           | \$ 79,100.00         |
| <b>Total Opinion of Project Cost</b>                                 |                                  |                   |             |                   |           | <b>\$ 342,700.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

## H. Boyd Lee Park Permeable Pavement Preliminary Opinion of Probable Construction Cost

| <i>Item Description</i>  |                                     | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|-------------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)                  | 1                 | LS          | \$ 53,070.00      | \$ 53,070.00         |
| 2  | Comprehensive Grading (20%)         | 1                 | LS          | \$ 88,400.00      | \$ 88,400.00         |
| 3  | Erosion Control (1-2 acre LOD)      | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 4  | Excavation                          | 813               | CY          | \$ 25.00          | \$ 20,331.79         |
| 5  | Hauling                             | 813               | CY          | \$ 4.00           | \$ 3,253.09          |
| 6  | Rip Rap Stone, Class B              | 472               | TN          | \$ 65.00          | \$ 30,694.44         |
| 7  | Rip Rap Stone, Class 1              | 472               | TN          | \$ 70.00          | \$ 33,055.56         |
| 8  | PICP (Permeable Pavers), 3.5" thick | 17000             | SF          | \$ 20.00          | \$ 340,000.00        |
| Subtotal   |                                     |                   |             |                   | \$ 583,804.88        |
| 30% Contingency  |                                     |                   |             |                   | \$ 175,100.00        |
| <b>Total</b>   |                                     |                   |             |                   | <b>\$ 758,904.88</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                     |                   |             |                   | \$ 227,700.00        |
| <b>Total Opinion of Project Cost</b>                                 |                                     |                   |             |                   | <b>\$ 986,600.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

**Faith Assembly Church Pond Retrofit**  
**Preliminary Opinion of Probable Construction Cost**

| <i>Item Description</i> |                                  | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i>  |           | <i>Amount</i>     |
|-------------------------|----------------------------------|-------------------|-------------|--|-----------|-------------------|
| 1                       | Mobilization (10%)               | 1                 | LS          | \$   | 14,530.00 | \$ 14,530.00      |
| 2                       | Comprehensive Grading (20%)      | 1                 | LS          | \$   | 24,200.00 | \$ 24,200.00      |
| 3                       | Erosion Control (1-2 acre LOD)   | 1                 | LS          | \$   | 15,000.00 | \$ 15,000.00      |
| 4                       | Excavation                       | 3333              | CY          | \$   | 25.00     | \$ 83,333.33      |
| 5                       | Hauling                          | 3333              | CY          | \$   | 4.00      | \$ 13,333.33      |
| 6                       | Construction Staking (0-300000)  | 1                 | EA          | \$   | 3,000.00  | \$ 3,000.00       |
| 7                       | 24" R.C. Pipe Culvert, Class III | 20                | LF          | \$   | 70.00     | \$ 1,400.00       |
| 8                       | Flared End Section, 24 inch      | 1                 | EA          | \$   | 2,000.00  | \$ 2,000.00       |
| 9                       | Drainage Structures, Inlet       | 1                 | EA          | \$   | 3,000.00  | \$ 3,000.00       |
|                         |                                  |                   |             | Subtotal   | \$        | 159,796.67        |
|                         |                                  |                   |             | 30% Contingency  | \$        | 47,900.00         |
|                         |                                  |                   |             | <b>Total</b>   | <b>\$</b> | <b>207,696.67</b> |
|                         |                                  |                   |             | Design, Administration, Fiscal and Legal (30% of Construction Costs) | \$        | 62,300.00         |
|                         |                                  |                   |             | <b>Total Opinion of Project Cost</b>                                 | <b>\$</b> | <b>270,000.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

## County Home Road Regenerative Stormwater Conveyance Preliminary Opinion of Probable Construction Cost

| <i>Item Description</i>  |                                | <b>QUANTITIES</b> | <b>Unit</b> | <b>Unit Price</b> | <b>Amount</b>        |
|--|--------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)             | 1                 | LS          | \$ 26,150.00      | \$ 26,150.00         |
| 2  | Comprehensive Grading (20%)    | 1                 | LS          | \$ 43,580.00      | \$ 43,580.00         |
| 3  | Erosion Control (1-2 acre LOD) | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 4  | Excavation                     | 1194              | CY          | \$ 25.00          | \$ 29,861.11         |
| 5  | Hauling                        | 1194              | CY          | \$ 4.00           | \$ 4,777.78          |
| 6  | RSC Sand/Wood Chip Mixture     | 1322              | CY          | \$ 45.00          | \$ 59,500.00         |
| 7  | Cascade Boulder                | 693               | TN          | \$ 75.00          | \$ 52,000.00         |
| 8  | Cobble                         | 693               | TN          | \$ 75.00          | \$ 52,000.00         |
| 9  | BMP Plantings                  | 2389              | SF          | \$ 2.00           | \$ 4,777.78          |
| Subtotal   |                                |                   |             |                   | \$ 287,646.67        |
| 30% Contingency  |                                |                   |             |                   | \$ 86,300.00         |
| <b>Total</b>   |                                |                   |             |                   | <b>\$ 373,946.67</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                |                   |             |                   | \$ 112,200.00        |
| <b>Total Opinion of Project Cost</b>                                 |                                |                   |             |                   | <b>\$ 486,100.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

## Irish Creek Regenerative Stormwater Conveyance Preliminary Opinion of Probable Construction Cost

| <i>Item Description</i>  |                                | <b>QUANTITIES</b> | <b>Unit</b> | <b>Unit Price</b> | <b>Amount</b>        |
|--|--------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)             | 1                 | LS          | \$ 13,580.00      | \$ 13,580.00         |
| 2  | Comprehensive Grading (20%)    | 1                 | LS          | \$ 22,640.00      | \$ 22,640.00         |
| 3  | Erosion Control (1-2 acre LOD) | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 4  | Excavation                     | 667               | CY          | \$ 25.00          | \$ 16,666.67         |
| 5  | Hauling                        | 667               | CY          | \$ 4.00           | \$ 2,666.67          |
| 6  | RSC Sand/Wood Chip Mixture     | 1025              | CY          | \$ 45.00          | \$ 46,133.33         |
| 7  | Cascade Boulders               | 200               | TN          | \$ 75.00          | \$ 15,022.22         |
| 8  | Cobble                         | 200               | TN          | \$ 75.00          | \$ 15,022.22         |
| 9  | BMP Plantings                  | 1333              | SF          | \$ 2.00           | \$ 2,666.67          |
| Subtotal   |                                |                   |             |                   | \$ 149,397.78        |
| 30% Contingency  |                                |                   |             |                   | \$ 44,800.00         |
| <b>Total</b>   |                                |                   |             |                   | <b>\$ 194,197.78</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                |                   |             |                   | \$ 58,300.00         |
| <b>Total Opinion of Project Cost</b>                                 |                                |                   |             |                   | <b>\$ 252,500.00</b> |

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

## The Oaks Regenerative Stormwater Conveyance Preliminary Opinion of Probable Construction Cost

| <i>Item Description</i>  |                                | <b>QUANTITIES</b> | <b>Unit</b> | <b>Unit Price</b> | <b>Amount</b>        |
|--|--------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)             | 1                 | LS          | \$ 10,930.00      | \$ 10,930.00         |
| 2  | Comprehensive Grading (20%)    | 1                 | LS          | \$ 18,210.00      | \$ 18,210.00         |
| 3  | Erosion Control (1-2 acre LOD) | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 4  | Excavation                     | 667               | CY          | \$ 25.00          | \$ 16,666.67         |
| 5  | Hauling                        | 667               | CY          | \$ 4.00           | \$ 2,666.67          |
| 6  | RSC Sand/Wood Chip Mixture     | 844               | CY          | \$ 45.00          | \$ 38,000.00         |
| 7  | Cascade Boulders               | 123               | TN          | \$ 75.00          | \$ 9,244.44          |
| 8  | Cobble                         | 123               | TN          | \$ 75.00          | \$ 9,244.44          |
| 9  | BMP Plantings                  | 119               | SF          | \$ 2.00           | \$ 237.50            |
| Subtotal   |                                |                   |             |                   | \$ 120,199.72        |
| 30% Contingency  |                                |                   |             |                   | \$ 36,100.00         |
| <b>Total</b>   |                                |                   |             |                   | <b>\$ 156,299.72</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                |                   |             |                   | \$ 46,900.00         |
| <b>Total Opinion of Project Cost</b>                                 |                                |                   |             |                   | <b>\$ 203,200.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

**South Hall Bioretention  
Preliminary Opinion of Probable Construction Cost**

| <i>Item Description</i>  |   | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> |           | <i>Amount</i>        |
|--|---|-------------------|-------------|-------------------|-----------|----------------------|
| 1  | Mobilization (10%)                                    | 1                 | LS          | \$                | 12,660.00 | \$ 12,660.00         |
| 2  | Comprehensive Grading (20%)                           | 1                 | LS          | \$                | 20,600.00 | \$ 20,600.00         |
| 3  | Construction Staking (0-300000)                       | 1                 | LS          | \$                | 3,000.00  | \$ 3,000.00          |
| 4  | Erosion Control (1-2 acre LOD)                        | 1                 | LS          | \$                | 15,000.00 | \$ 15,000.00         |
| 5  | Excavation  | 648               | CY          | \$                | 25.00     | \$ 16,203.70         |
| 6  | Hauling   | 648               | CY          | \$                | 4.00      | \$ 2,592.59          |
| 7  | Soil Media  | 648               | CY          | \$                | 50.00     | \$ 32,407.41         |
| 8  | BMP Plantings   | 3500              | SF          | \$                | 2.00      | \$ 7,000.00          |
| 9  | Seeding and Mulching                                  | 0.1               | AC          | \$                | 7,500.00  | \$ 602.62            |
| 10   | 18" R.C. Pipe Culvert, Class III                      | 199               | LF          | \$                | 55.00     | \$ 10,945.00         |
| 11   | Concrete Curb and Gutter                              | 101               | LF          | \$                | 35.00     | \$ 3,535.00          |
| 12   | Asphalt Replacement (Surface, Base Course, & Milling) | 50                | SY          | \$                | 55.00     | \$ 2,737.78          |
| 13   | Drainage Structures, Inlet                            | 4                 | EA          | \$                | 3,000.00  | \$ 12,000.00         |
| Subtotal   |   |                   |             |                   |           | \$ 139,284.10        |
| 30% Contingency  |   |                   |             |                   |           | \$ 41,800.00         |
| <b>Total</b>   |   |                   |             |                   |           | <b>\$ 181,084.10</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |   |                   |             |                   |           | \$ 54,300.00         |
| <b>Total Opinion of Project Cost</b>                                 |   |                   |             |                   |           | <b>\$ 235,400.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.



**Paramore Park Wetland  
Preliminary Opinion of Probable Construction Cost**

| <i>Item Description</i>  |                                  | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|----------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)               | 1                 | LS          | \$ 11,350.00      | \$ 11,350.00         |
| 2  | Comprehensive Grading (20%)      | 1                 | LS          | \$ 18,400.00      | \$ 18,400.00         |
| 3  | Construction Staking (0-300000)  | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4  | Erosion Control (1-2 acre LOD)   | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 5  | Excavation                       | 667               | CY          | \$ 25.00          | \$ 16,666.67         |
| 6  | Hauling                          | 667               | CY          | \$ 4.00           | \$ 2,666.67          |
| 7  | Soil Media                       | 667               | CY          | \$ 50.00          | \$ 33,333.33         |
| 8  | BMP Plantings                    | 6000              | SF          | \$ 2.00           | \$ 12,000.00         |
| 9  | Seeding and Mulching             | 0.1               | AC          | \$ 7,500.00       | \$ 1,033.06          |
| 10   | 24" R.C. Pipe Culvert, Class III | 120               | LF          | \$ 70.00          | \$ 8,400.00          |
| 11   | Drainage Structures, Inlet       | 1                 | EA          | \$ 3,000.00       | \$ 3,000.00          |
| Subtotal   |                                  |                   |             |                   | \$ 124,849.72        |
| 30% Contingency  |                                  |                   |             |                   | \$ 37,500.00         |
| <b>Total</b>   |                                  |                   |             |                   | <b>\$ 162,349.72</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                  |                   |             |                   | \$ 48,700.00         |
| <b>Total Opinion of Project Cost</b>                                 |                                  |                   |             |                   | <b>\$ 211,000.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

## WGP Properties Regenerative Stormwater Conveyance Preliminary Opinion of Probable Construction Cost

| <i>Item Description</i>  |                                | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>       |
|--|--------------------------------|-------------------|-------------|-------------------|---------------------|
| 1  | Mobilization (10%)             | 1                 | LS          | \$ 3,320.00       | \$ 3,320.00         |
| 2  | Comprehensive Grading (20%)    | 1                 | LS          | \$ 5,600.00       | \$ 5,600.00         |
| 3  | Erosion Control (1-2 acre LOD) | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00        |
| 4  | Excavation                     | 67                | CY          | \$ 25.00          | \$ 1,666.67         |
| 5  | Hauling                        | 67                | CY          | \$ 4.00           | \$ 266.67           |
| 6  | RSC Sand/Wood Chip Mixture     | 133               | CY          | \$ 45.00          | \$ 6,000.00         |
| 7  | Cascade Boulders               | 31                | TN          | \$ 75.00          | \$ 2,311.11         |
| 8  | Cobble                         | 31                | TN          | \$ 75.00          | \$ 2,311.11         |
| 9  | BMP Plantings                  | 19                | SF          | \$ 2.00           | \$ 37.50            |
| Subtotal   |                                |                   |             |                   | \$ 36,513.06        |
| 30% Contingency  |                                |                   |             |                   | \$ 11,000.00        |
| <b>Total</b>   |                                |                   |             |                   | <b>\$ 47,513.06</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                |                   |             |                   | \$ 14,300.00        |
| <b>Total Opinion of Project Cost</b>                                 |                                |                   |             |                   | <b>\$ 61,800.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

**Wintergreen Elementary Bioretention  
Preliminary Opinion of Probable Construction Cost**

| <i>Item Description</i> |                                  | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> |  | <i>Amount</i>        |
|-------------------------|----------------------------------|-------------------|-------------|-------------------|--|----------------------|
| 1                       | Mobilization (10%)               | 1                 | LS          | \$                | 16,880.00  | \$ 16,880.00         |
| 2                       | Comprehensive Grading (20%)      | 1                 | LS          | \$                | 27,600.00  | \$ 27,600.00         |
| 3                       | Construction Staking (0-300000)  | 1                 | LS          | \$                | 3,000.00   | \$ 3,000.00          |
| 4                       | Erosion Control (1-2 acre LOD)   | 1                 | LS          | \$                | 15,000.00  | \$ 15,000.00         |
| 5                       | Excavation                       | 1111              | CY          | \$                | 25.00  | \$ 27,777.78         |
| 6                       | Hauling                          | 1111              | CY          | \$                | 4.00   | \$ 4,444.44          |
| 7                       | Soil Media                       | 1111              | CY          | \$                | 50.00  | \$ 55,555.56         |
| 8                       | BMP Plantings                    | 6000              | SF          | \$                | 2.00   | \$ 12,000.00         |
| 9                       | Seeding and Mulching             | 0.1               | AC          | \$                | 7,500.00   | \$ 1,033.06          |
| 10                      | 24" R.C. Pipe Culvert, Class III | 36                | LF          | \$                | 70.00  | \$ 2,520.00          |
| 11                      | 36" R.C. Pipe Culvert, Class III | 107               | LF          | \$                | 120.00   | \$ 12,840.00         |
| 12                      | Concrete Curb and Gutter         | 30                | LF          | \$                | 35.00  | \$ 1,050.00          |
| 13                      | Drainage Structures, Inlet       | 2                 | EA          | \$                | 3,000.00   | \$ 6,000.00          |
|                         |                                  |                   |             |                   | Subtotal   | \$ 185,700.84        |
|                         |                                  |                   |             |                   | 30% Contingency  | \$ 55,700.00         |
|                         |                                  |                   |             |                   | <b>Total</b>   | <b>\$ 241,400.84</b> |
|                         |                                  |                   |             |                   | Design, Administration, Fiscal and Legal (30% of Construction Costs) | \$ 72,400.00         |
|                         |                                  |                   |             |                   | <b>Total Opinion of Project Cost</b>                                 | <b>\$ 313,800.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

## Wintergreen Elementary Regenerative Stormwater Conveyance Preliminary Opinion of Probable Construction Cost

| Item Description   |   | QUANTITIES | Unit | Unit Price   | Amount               |
|--|---|------------|------|--------------|----------------------|
| 1  | Mobilization (10%)                        | 1          | LS   | \$ 6,200.00  | \$ 6,200.00          |
| 2  | Comprehensive Grading (20%)               | 1          | LS   | \$ 16,800.00 | \$ 16,800.00         |
| 3  | Erosion Control (1-2 acre LOD)            | 1          | LS   | \$ 15,000.00 | \$ 15,000.00         |
| 4  | Excavation                                | 233        | CY   | \$ 25.00     | \$ 5,833.33          |
| 5  | Hauling                                   | 233        | CY   | \$ 4.00      | \$ 933.33            |
| 6  | RSC Sand/Wood Chip Mixture                | 467        | CY   | \$ 45.00     | \$ 21,000.00         |
| 7  | Cascade Boulders                          | 216        | TN   | \$ 75.00     | \$ 16,177.78         |
| 8  | Cobble                                    | 216        | TN   | \$ 75.00     | \$ 16,177.78         |
| 9  | BMP Plantings                             | 66         | SF   | \$ 2.00      | \$ 131.25            |
| 10   | Flared End Section, 48 inch               | 1          | EA   | \$ 2,500.00  | \$ 2,500.00          |
| 11   | Drainage Structures, DOT Standard Endwall | 1          | EA   | \$ 6,000.00  | \$ 6,000.00          |
| Subtotal   |   |            |      |              | \$ 106,753.47        |
| 30% Contingency  |   |            |      |              | \$ 32,000.00         |
| <b>Total</b>   |   |            |      |              | <b>\$ 138,753.47</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |   |            |      |              | \$ 41,600.00         |
| <b>Total Opinion of Project Cost</b>                                 |   |            |      |              | <b>\$ 180,400.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

## Wintergreen Elementary Rainwater Harvesting System

### Preliminary Opinion of Probable Construction Cost

| Item Description   |                    | QUANTITIES | Unit | Unit Price | Amount              |
|--|--------------------|------------|------|------------|---------------------|
| 1  | Mobilization (10%) | 1          | LS   | \$ 960.00  | \$ 960.00           |
| 2  | Cistern            | 3000       | GAL  | \$ 1.00    | \$ 3,000.00         |
| 3  | 8" PVC Gutter      | 120        | LF   | \$ 55.00   | \$ 6,600.00         |
| Subtotal   |                    |            |      |            | \$ 10,560.00        |
| 30% Contingency  |                    |            |      |            | \$ 3,200.00         |
| <b>Total</b>   |                    |            |      |            | <b>\$ 13,760.00</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                    |            |      |            | \$ 4,100.00         |
| <b>Total Opinion of Project Cost</b>                                 |                    |            |      |            | <b>\$ 17,900.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

**Belle Meade Apartments Wetland  
Preliminary Opinion of Probable Construction Cost**

| <i>Item Description</i>  |                                  | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|----------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)               | 1                 | LS          | \$ 30,580.00      | \$ 30,580.00         |
| 2  | Comprehensive Grading (20%)      | 1                 | LS          | \$ 50,400.00      | \$ 50,400.00         |
| 3  | Construction Staking (0-300000)  | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4  | Erosion Control (1-2 acre LOD)   | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 5  | Excavation                       | 2222              | CY          | \$ 25.00          | \$ 55,555.56         |
| 6  | Hauling                          | 2222              | CY          | \$ 4.00           | \$ 8,888.89          |
| 7  | Soil Media                       | 2222              | CY          | \$ 50.00          | \$ 111,111.11        |
| 8  | BMP Plantings                    | 20000             | SF          | \$ 2.00           | \$ 40,000.00         |
| 9  | Seeding and Mulching             | 0.5               | AC          | \$ 7,500.00       | \$ 3,443.53          |
| 10   | 24" R.C. Pipe Culvert, Class III | 45                | LF          | \$ 70.00          | \$ 3,150.00          |
| 11   | Flared End Section, 24 inch      | 1                 | EA          | \$ 2,000.00       | \$ 2,000.00          |
| 12   | 36" R.C. Pipe Culvert, Class III | 40                | LF          | \$ 120.00         | \$ 4,800.00          |
| 13   | Flared End Section, 36 inch      | 1                 | EA          | \$ 2,500.00       | \$ 2,500.00          |
| 14   | Drainage Structures, Inlet       | 2                 | EA          | \$ 3,000.00       | \$ 6,000.00          |
| Subtotal   |                                  |                   |             |                   | \$ 336,429.08        |
| 30% Contingency  |                                  |                   |             |                   | \$ 100,900.00        |
| <b>Total</b>   |                                  |                   |             |                   | <b>\$ 437,329.08</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                  |                   |             |                   | \$ 131,200.00        |
| <b>Total Opinion of Project Cost</b>                                 |                                  |                   |             |                   | <b>\$ 568,500.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

## Greenville Convention Center Permeable Pavement Preliminary Opinion of Probable Construction Cost

| <i>Item Description</i>  |                                     | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>          |
|--|-------------------------------------|-------------------|-------------|-------------------|------------------------|
| 1  | Mobilization (10%)                  | 1                 | LS          | \$ 50,960.00      | \$ 50,960.00           |
| 2  | Comprehensive Grading (20%)         | 1                 | LS          | \$ 274,000.00     | \$ 274,000.00          |
| 3  | Construction Staking (0-300000)     | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00            |
| 4  | Erosion Control (1-2 acre LOD)      | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00           |
| 5  | Excavation                          | 2282              | CY          | \$ 25.00          | \$ 57,055.56           |
| 6  | Hauling                             | 2282              | CY          | \$ 4.00           | \$ 9,128.89            |
| 7  | Bedding Layer                       | 439               | TN          | \$ 50.00          | \$ 21,944.44           |
| 8  | Base Aggregate                      | 878               | TN          | \$ 50.00          | \$ 43,888.89           |
| 9  | Gravel Casing                       | 1317              | TN          | \$ 65.00          | \$ 85,583.33           |
| 10   | PICP (Permeable Pavers), 3.5" thick | 47400             | SF          | \$ 24.00          | \$ 1,137,600.00        |
| Subtotal   |                                     |                   |             |                   | \$ 1,698,161.11        |
| 30% Contingency  |                                     |                   |             |                   | \$ 509,400.00          |
| <b>Total</b>   |                                     |                   |             |                   | <b>\$ 2,207,561.11</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                     |                   |             |                   | \$ 662,300.00          |
| <b>Total Opinion of Project Cost</b>                                 |                                     |                   |             |                   | <b>\$ 2,869,900.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

**Lynndale Court Bioretention  
Preliminary Opinion of Probable Construction Cost**

| <i>Item Description</i>  |                                  | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|----------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)               | 1                 | LS          | \$ 8,310.00       | \$ 8,310.00          |
| 2  | Comprehensive Grading (20%)      | 1                 | LS          | \$ 13,400.00      | \$ 13,400.00         |
| 3  | Construction Staking (0-300000)  | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4  | Erosion Control (1-2 acre LOD)   | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 5  | Excavation                       | 463               | CY          | \$ 25.00          | \$ 11,574.07         |
| 6  | Hauling                          | 463               | CY          | \$ 4.00           | \$ 1,851.85          |
| 7  | Soil Media                       | 463               | CY          | \$ 50.00          | \$ 23,148.15         |
| 8  | BMP Plantings                    | 2500              | SF          | \$ 2.00           | \$ 5,000.00          |
| 9  | Seeding and Mulching             | 0.1               | AC          | \$ 7,500.00       | \$ 430.44            |
| 10   | 15" R.C. Pipe Culvert, Class III | 18                | LF          | \$ 50.00          | \$ 900.00            |
| 11   | Concrete Curb and Gutter         | 80                | LF          | \$ 35.00          | \$ 2,800.00          |
| 12   | Drainage Structures, Inlet       | 2                 | EA          | \$ 3,000.00       | \$ 6,000.00          |
| Subtotal   |                                  |                   |             |                   | \$ 91,414.51         |
| 30% Contingency  |                                  |                   |             |                   | \$ 27,400.00         |
| <b>Total</b>   |                                  |                   |             |                   | <b>\$ 118,814.51</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                  |                   |             |                   | \$ 35,600.00         |
| <b>Total Opinion of Project Cost</b>                                 |                                  |                   |             |                   | <b>\$ 154,400.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.



**Westhaven South Wetland  
Preliminary Opinion of Probable Construction Cost**

| <i>Item Description</i>  |                                  | <i>QUANTITIES</i> | <i>Unit</i> | <i>Unit Price</i> | <i>Amount</i>        |
|--|----------------------------------|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)               | 1                 | LS          | \$ 40,540.00      | \$ 40,540.00         |
| 2  | Comprehensive Grading (20%)      | 1                 | LS          | \$ 73,600.00      | \$ 73,600.00         |
| 3  | Construction Staking (0-300000)  | 1                 | LS          | \$ 3,000.00       | \$ 3,000.00          |
| 4  | Erosion Control (1-2 acre LOD)   | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 5  | Excavation                       | 556               | CY          | \$ 25.00          | \$ 13,888.89         |
| 6  | Hauling                          | 556               | CY          | \$ 4.00           | \$ 2,222.22          |
| 7  | Soil Media                       | 556               | CY          | \$ 50.00          | \$ 27,777.78         |
| 8  | 4" Concrete Sidewalk             | 430               | LF          | \$ 40.00          | \$ 17,200.00         |
| 9  | BMP Plantings                    | 6000              | SF          | \$ 40.00          | \$ 240,000.00        |
| 10   | Seeding and Mulching             | 0.1               | AC          | \$ 7,500.00       | \$ 1,033.06          |
| 11   | 24" R.C. Pipe Culvert, Class III | 81                | LF          | \$ 70.00          | \$ 5,670.00          |
| 12   | Drainage Structures, Inlet       | 2                 | EA          | \$ 3,000.00       | \$ 6,000.00          |
| 13   | 36" R.C. Pipe Culvert, Class III | 328               | LF          | \$ 120.00         | \$ 39,360.00         |
| Subtotal   |                                  |                   |             |                   | \$ 485,291.95        |
| 30% Contingency  |                                  |                   |             |                   | \$ 145,600.00        |
| <b>Total</b>   |                                  |                   |             |                   | <b>\$ 630,891.95</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |                                  |                   |             |                   | \$ 189,300.00        |
| <b>Total Opinion of Project Cost</b>                                 |                                  |                   |             |                   | <b>\$ 820,200.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

## Shamrock Regenerative Stormwater Conveyance Preliminary Opinion of Probable Construction Cost

| <i>Item Description</i>  |   | <b>QUANTITIES</b> | <b>Unit</b> | <b>Unit Price</b> | <b>Amount</b>        |
|--|---|-------------------|-------------|-------------------|----------------------|
| 1  | Mobilization (10%)                        | 1                 | LS          | \$ 2,950.00       | \$ 2,950.00          |
| 2  | Comprehensive Grading (20%)               | 1                 | LS          | \$ 12,600.00      | \$ 12,600.00         |
| 3  | Erosion Control (1-2 acre LOD)            | 1                 | LS          | \$ 15,000.00      | \$ 15,000.00         |
| 4  | Excavation                                | 97                | CY          | \$ 25.00          | \$ 2,430.56          |
| 5  | Hauling                                   | 97                | CY          | \$ 4.00           | \$ 388.89            |
| 6  | RSC Sand/Wood Chip Mixture                | 272               | CY          | \$ 45.00          | \$ 12,250.00         |
| 7  | Cascade Boulders                          | 58                | TN          | \$ 75.00          | \$ 4,333.33          |
| 8  | Cobble                                    | 58                | TN          | \$ 75.00          | \$ 4,333.33          |
| 9  | BMP Plantings                             | 27                | SF          | \$ 2.00           | \$ 54.69             |
| 10   | Flared End Section, 42 inch               | 1                 | EA          | \$ 2,500.00       | \$ 2,500.00          |
| 11   | Drainage Structures, DOT Standard Endwall | 1                 | EA          | \$ 6,000.00       | \$ 6,000.00          |
| 12   | Remove 42" RCP Type III                   | 85                | LF          | \$ 150.00         | \$ 12,750.00         |
| 13   | Remove Drainage Structure, Inlet          | 1                 | EA          | \$ 3,000.00       | \$ 3,000.00          |
| Subtotal   |   |                   |             |                   | \$ 78,590.80         |
| 30% Contingency  |   |                   |             |                   | \$ 23,600.00         |
| <b>Total</b>   |   |                   |             |                   | <b>\$ 102,190.80</b> |
| Design, Administration, Fiscal and Legal (30% of Construction Costs) |   |                   |             |                   | \$ 30,700.00         |
| <b>Total Opinion of Project Cost</b>                                 |   |                   |             |                   | <b>\$ 132,900.00</b> |

\* Cost for comprehensive grading includes roadway excavation, saw cutting, compaction of select material, geotechnical recommendations, home owner coordination, tree and structure protection, structure removal and disposal, shoring, and culvert excavation.

*The Engineer's opinions of probable construction costs are made on the basis of the Engineer's experience and qualifications and represent the Engineer's best judgment as a professional generally familiar with the construction industry. Since the Engineer has no control over the cost of labor, materials, equipment, or services furnished by others; over the contractors methods of determining prices; or over competitive bidding or marketing conditions, the Engineer's cannot and does not guarantee that proposal, bids or actual construction costs will not vary from opinions of probable construction costs prepared by the Engineer.*

---

## Appendix H:

# Hydraulic & Hydrologic Input and Output Data

### List of Contents:

1. HEC-HMS Output (2-,10-,25-,50-, and 100-Year Storms)
    - a. Existing Conditions
    - b. Future Conditions
    - c. Alternative
  
  2. Existing Conditions HEC-RAS Output (2-,10-,25-,50-, and 100-Year Storms)
    - a. Fork Swamp Primary System
    - b. FSUT1 Primary System
    - c. FSUT2R1 Primary System
    - d. FSUT2R2 Primary System
    - e. FSUT3 Primary System
  
  3. Future Conditions HEC-RAS Output (2-,10-,25-,50-, and 100-Year Storms)
    - a. Fork Swamp Primary System
    - b. FSUT1 Primary System
    - c. FSUT2R1 Primary System
    - d. FSUT2R2 Primary System
    - e. FSUT3 Primary System
  
  4. Alternative HEC-RAS Output (2-,10-,25-,50-, and 100-Year Storms)
    - a. Fork Swamp Primary System
    - b. FSUT1 Primary System
    - c. FSUT2R1 Primary System
    - d. FSUT2R2 Primary System
    - e. FSUT3 Primary System
-

- 
5. Existing Conditions HEC-RAS Output (2-,10-,25-,50-, and 100-Year Storms)
    - a. Evans Live Oak Secondary System
    - b. Evans Upstream Secondary System
  6. Existing Conditions SWMM Output for Corey Road (10-Year)
  7. Alternative SWMM Output for Corey Road (10-Year)
  8. Existing Conditions Hydraflow Storm Sewers Trafalgar Drive (10-Year)
-

**PRIMARY SYSTEM  
EXISTING CONDITIONS:  
HEC-HMS OUTPUT**

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR EXISTING</b>       |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 34                              | 04Aug2013, 15:10    | 12.6                      |
| FSUT3-1B                     | 0.10                                      | 41.5                            | 04Aug2013, 13:55    | 8.9                       |
| FSUT3-1C                     | 0.09                                      | 19.8                            | 04Aug2013, 14:45    | 6.4                       |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 77.7                            | 04Aug2013, 14:20    | 27.9                      |
| FSUT3-1D                     | 0.17                                      | 38.9                            | 04Aug2013, 15:50    | 16.8                      |
| RT FSUT3-1D                  | 0.17                                      | 38.9                            | 04Aug2013, 15:50    | 16.8                      |
| FSUT3-1E                     | 0.04                                      | 18.8                            | 04Aug2013, 13:25    | 2.6                       |
| U/S Limit FSUT3              | 0.49                                      | 108.2                           | 04Aug2013, 14:55    | 47.3                      |
| RT FSUT3-1E                  | 0.49                                      | 107.8                           | 04Aug2013, 15:00    | 47                        |
| FSUT3-2A                     | 0.08                                      | 9                               | 04Aug2013, 15:30    | 3.8                       |
| ADD FSUT3-2A                 | 0.58                                      | 116.3                           | 04Aug2013, 15:05    | 50.8                      |
| RT FSUT3-2A                  | 0.58                                      | 116.2                           | 04Aug2013, 15:10    | 50.7                      |
| FSUT3-2B                     | 0.11                                      | 17.7                            | 04Aug2013, 15:25    | 7                         |
| ADD FSUT3-2B                 | 0.69                                      | 133.8                           | 04Aug2013, 15:15    | 57.7                      |
| RT FSUT3-2B                  | 0.69                                      | 133                             | 04Aug2013, 15:20    | 57.2                      |
| FSUT3-3                      | 0.09                                      | 68.3                            | 04Aug2013, 13:20    | 8.2                       |
| ADD FSUT3-3                  | 0.78                                      | 140.9                           | 04Aug2013, 15:20    | 65.5                      |
| Coleman Drive                | 0.78                                      | 140.9                           | 04Aug2013, 15:20    | 65.5                      |
| FSUT3-5                      | 0.16                                      | 62.4                            | 04Aug2013, 14:40    | 19.2                      |
| Country Home Road            | 0.16                                      | 62.4                            | 04Aug2013, 14:40    | 19.2                      |
| RT FSUT3-5                   | 0.16                                      | 62.4                            | 04Aug2013, 14:40    | 19.2                      |
| FSUT3-6                      | 0.11                                      | 26.5                            | 04Aug2013, 14:45    | 8.4                       |
| ADD FSUT3-6                  | 0.27                                      | 88.9                            | 04Aug2013, 14:40    | 27.6                      |
| East Fire Tower Road - North | 0.27                                      | 88.7                            | 04Aug2013, 14:45    | 27.6                      |
| FSUT3-4C                     | 0.13                                      | 21.7                            | 04Aug2013, 16:25    | 10.6                      |
| FSUT3-4B                     | 0.07                                      | 40.8                            | 04Aug2013, 13:55    | 8.7                       |
| FSUT3-4A                     | 0.07                                      | 12.7                            | 04Aug2013, 16:25    | 6.2                       |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 48.5                            | 04Aug2013, 14:00    | 25.4                      |
| RT FSUT3-4C                  | 0.27                                      | 48.3                            | 04Aug2013, 14:10    | 25.3                      |
| FSUT3-4D                     | 0.08                                      | 83.9                            | 04Aug2013, 13:20    | 10.1                      |
| ADD FSUT3-4D                 | 0.62                                      | 143.8                           | 04Aug2013, 14:30    | 63                        |
| Wimbledon Drive              | 0.62                                      | 141.8                           | 04Aug2013, 14:40    | 62.9                      |
| FSUT3-7                      | 0.14                                      | 28.1                            | 04Aug2013, 16:25    | 13.6                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 158.6                           | 04Aug2013, 15:00    | 76.5                      |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 297.9                           | 04Aug2013, 15:10    | 141.9                     |
| FSUT3-8                      | 0.08                                      | 35.5                            | 04Aug2013, 13:45    | 6.7                       |
| East Fire Tower - South      | 1.62                                      | 308.4                           | 04Aug2013, 15:05    | 148.6                     |
| FSUT3-9B                     | 0.16                                      | 21                              | 04Aug2013, 17:40    | 12                        |
| FSUT3-9A                     | 0.05                                      | 25.2                            | 04Aug2013, 14:05    | 6                         |
| RT FSUT3-9A                  | 0.05                                      | 24.7                            | 04Aug2013, 14:25    | 5.9                       |
| ADD FSUT3-9B                 | 0.22                                      | 29.5                            | 04Aug2013, 14:30    | 17.9                      |
| Corey Road - FSUT3           | 0.22                                      | 29.5                            | 04Aug2013, 14:30    | 17.9                      |
| FSUT3-9C                     | 0.16                                      | 34.4                            | 04Aug2013, 15:50    | 14.9                      |
| ADD FSUT3-9C                 | 1.99                                      | 365.4                           | 04Aug2013, 15:10    | 181.4                     |
| RT FSUT 3-9C                 | 1.99                                      | 364.5                           | 04Aug2013, 15:15    | 180.9                     |
| FSUT3-9D                     | 0.09                                      | 81.1                            | 04Aug2013, 13:20    | 9.7                       |
| ADD FSUT3-9D                 | 2.08                                      | 373.3                           | 04Aug2013, 15:15    | 190.6                     |
| RT FSUT3-9D                  | 2.08                                      | 372.3                           | 04Aug2013, 15:20    | 189.5                     |
| FSUT3-10A                    | 0.24                                      | 34.5                            | 04Aug2013, 17:05    | 18.4                      |
| ADD FSUT3-10A                | 2.32                                      | 395.7                           | 04Aug2013, 15:30    | 208                       |
| RT FSUT3-10A                 | 2.32                                      | 395.2                           | 04Aug2013, 15:35    | 207.3                     |
| FSUT3-10C                    | 0.22                                      | 29.7                            | 04Aug2013, 16:00    | 13.4                      |
| FSUT3-10B                    | 0.09                                      | 87                              | 04Aug2013, 13:20    | 10.5                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 432.2                           | 04Aug2013, 15:35    | 231.2                     |
| RT FSUT3                     | 2.63                                      | 432.2                           | 04Aug2013, 21:05    | 185.9                     |
| FS-1B                        | 0.13                                      | 48.9                            | 04Aug2013, 14:40    | 15                        |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR EXISTING</b>     |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FS-1A                      | 0.12                                      | 52.6                            | 04Aug2013, 14:35    | 16.2                      |
| RT FS-1A                   | 0.12                                      | 52.5                            | 04Aug2013, 14:40    | 16.2                      |
| ADD FS-1B                  | 0.25                                      | 101.4                           | 04Aug2013, 14:40    | 31.2                      |
| RT FS-1B                   | 0.25                                      | 100.8                           | 04Aug2013, 14:45    | 31.1                      |
| FS-2A                      | 0.16                                      | 48.2                            | 04Aug2013, 14:40    | 14.9                      |
| RT FS-2A                   | 0.16                                      | 48                              | 04Aug2013, 14:45    | 14.9                      |
| FS-2B                      | 0.08                                      | 62                              | 04Aug2013, 13:30    | 9.1                       |
| ADD FS-2B                  | 0.23                                      | 74                              | 04Aug2013, 13:30    | 24                        |
| RT FS-2B                   | 0.23                                      | 73.1                            | 04Aug2013, 13:35    | 23.9                      |
| ADD FS1-2                  | 0.48                                      | 160.9                           | 04Aug2013, 14:45    | 55.1                      |
| FS-3                       | 0.08                                      | 37.1                            | 04Aug2013, 14:05    | 8.8                       |
| East Baywood Lane          | 0.56                                      | 188                             | 04Aug2013, 14:40    | 63.8                      |
| U/S Limit FS               | 0.56                                      | 188                             | 04Aug2013, 14:40    | 63.8                      |
| FS-4B                      | 0.12                                      | 61.1                            | 04Aug2013, 14:05    | 14.5                      |
| FS-4A                      | 0.10                                      | 24.2                            | 04Aug2013, 15:45    | 10.4                      |
| RT FS-4A                   | 0.10                                      | 24.2                            | 04Aug2013, 15:55    | 10.4                      |
| ADD FS-4B                  | 0.22                                      | 70                              | 04Aug2013, 14:10    | 24.9                      |
| RT FS-4B                   | 0.22                                      | 67.6                            | 04Aug2013, 14:20    | 24.7                      |
| Railroad                   | 0.78                                      | 250.5                           | 04Aug2013, 14:45    | 88.4                      |
| FS-5                       | 0.05                                      | 38.7                            | 04Aug2013, 13:20    | 4.7                       |
| Evans Street               | 0.83                                      | 255.9                           | 04Aug2013, 14:45    | 93                        |
| FS-6A                      | 0.16                                      | 43.2                            | 04Aug2013, 15:45    | 18.5                      |
| FS-6B                      | 0.09                                      | 58.4                            | 04Aug2013, 13:25    | 7.9                       |
| RT FS-6A-6B                | 0.25                                      | 64.1                            | 04Aug2013, 13:35    | 26.3                      |
| FS-6E                      | 0.11                                      | 19                              | 04Aug2013, 15:55    | 8.3                       |
| FS-6D                      | 0.10                                      | 25                              | 04Aug2013, 15:15    | 9.4                       |
| ADD FS-6D-6E               | 0.20                                      | 42.9                            | 04Aug2013, 15:30    | 17.7                      |
| FS-6C                      | 0.15                                      | 46.6                            | 04Aug2013, 14:40    | 14.5                      |
| ADD FS-6C                  | 1.44                                      | 382.4                           | 04Aug2013, 14:50    | 151.5                     |
| FS-6F                      | 0.17                                      | 24.3                            | 04Aug2013, 17:35    | 13.9                      |
| ADD FS-6F                  | 1.60                                      | 391.8                           | 04Aug2013, 14:55    | 165.3                     |
| RT FS-6F                   | 1.60                                      | 387.2                           | 04Aug2013, 15:00    | 164.3                     |
| FS-7A                      | 0.15                                      | 131.6                           | 04Aug2013, 13:20    | 15.8                      |
| ADD FS-7A                  | 1.75                                      | 403.3                           | 04Aug2013, 15:00    | 180.1                     |
| RT FS-7A                   | 1.75                                      | 402.7                           | 04Aug2013, 15:05    | 179.8                     |
| FS-7B                      | 0.15                                      | 36.8                            | 04Aug2013, 14:45    | 11.7                      |
| ADD FS-7B                  | 1.90                                      | 437.8                           | 04Aug2013, 15:00    | 191.5                     |
| E Fire Tower Road (Bridge) | 1.90                                      | 437.8                           | 04Aug2013, 15:00    | 191.5                     |
| RT FS-7B                   | 1.90                                      | 434.8                           | 04Aug2013, 15:10    | 190.7                     |
| FS-8E                      | 0.12                                      | 44.3                            | 04Aug2013, 13:40    | 8                         |
| ADD FS8-E                  | 2.03                                      | 447.1                           | 04Aug2013, 15:05    | 198.7                     |
| RT FS-8E                   | 2.03                                      | 446.5                           | 04Aug2013, 15:10    | 198.5                     |
| FS-8B                      | 0.13                                      | 27.9                            | 04Aug2013, 15:05    | 10.1                      |
| FS-8C                      | 0.09                                      | 55.3                            | 04Aug2013, 13:35    | 8.9                       |
| FS-8A                      | 0.06                                      | 11.1                            | 04Aug2013, 16:25    | 5.4                       |
| ADD FS-8A-8B-8C            | 0.28                                      | 63.9                            | 04Aug2013, 13:40    | 24.4                      |
| RT FS-8C                   | 0.28                                      | 63.5                            | 04Aug2013, 13:45    | 24.3                      |
| FS-8D                      | 0.07                                      | 43                              | 04Aug2013, 13:20    | 5.3                       |
| ADD FS-8D                  | 2.38                                      | 499.5                           | 04Aug2013, 15:10    | 228                       |
| ADD FSUT3 to FS            | 5.01                                      | 538                             | 04Aug2013, 20:55    | 413.9                     |
| FS-9                       | 0.14                                      | 29.4                            | 04Aug2013, 14:15    | 7.7                       |
| ADD FS-9                   | 5.15                                      | 541                             | 04Aug2013, 20:55    | 421.6                     |
| RT FS-9                    | 5.15                                      | 540.4                           | 04Aug2013, 20:55    | 419.7                     |
| FSUT2-3                    | 0.21                                      | 22.3                            | 04Aug2013, 17:50    | 12.9                      |
| FSUT2-1                    | 0.14                                      | 50.8                            | 04Aug2013, 14:05    | 11.6                      |
| U/S Limit FSUT2-2          | 0.14                                      | 50.8                            | 04Aug2013, 14:05    | 11.6                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR EXISTING</b>    |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 48.8                            | 04Aug2013, 14:10    | 11.6                      |
| FSUT2-2                   | 0.03                                      | 20.3                            | 04Aug2013, 13:20    | 2.5                       |
| ADD FSUT2-2               | 0.17                                      | 53.4                            | 04Aug2013, 14:10    | 14                        |
| RT FSUT2-2                | 0.17                                      | 53                              | 04Aug2013, 14:15    | 14                        |
| ADD FSUT2-3               | 0.38                                      | 56.5                            | 04Aug2013, 14:15    | 27                        |
| RT FSUT2-3                | 0.38                                      | 56.4                            | 04Aug2013, 14:20    | 26.9                      |
| FSUT2-4                   | 0.14                                      | 31.1                            | 04Aug2013, 15:50    | 13.5                      |
| ADD FSUT2-4               | 0.52                                      | 73.9                            | 04Aug2013, 14:30    | 40.4                      |
| RT FSUT2-4                | 0.52                                      | 73.7                            | 04Aug2013, 14:40    | 40.2                      |
| FSUT2-5                   | 0.21                                      | 36.2                            | 04Aug2013, 17:00    | 19.2                      |
| West Fire Tower Rd        | 0.73                                      | 99.3                            | 04Aug2013, 16:25    | 59.2                      |
| D/S Limit FSUT2-2         | 0.73                                      | 99.3                            | 04Aug2013, 16:25    | 59.2                      |
| FSUT2-6                   | 0.31                                      | 52.5                            | 04Aug2013, 17:30    | 29.8                      |
| ADD FSUT2-6               | 1.05                                      | 148.5                           | 04Aug2013, 16:50    | 89                        |
| RT FSUT2-6                | 1.05                                      | 148.3                           | 04Aug2013, 17:00    | 88.2                      |
| FSUT2-7A                  | 0.19                                      | 27.4                            | 04Aug2013, 17:05    | 14.7                      |
| ADD FSUT2-7A              | 1.24                                      | 175.7                           | 04Aug2013, 17:00    | 102.8                     |
| RT FSUT2-7A               | 1.24                                      | 175.5                           | 04Aug2013, 17:10    | 102.1                     |
| FSUT2-7B                  | 0.42                                      | 45.7                            | 04Aug2013, 18:50    | 28.6                      |
| ADD FSUT2-7B              | 1.66                                      | 214.8                           | 04Aug2013, 17:25    | 130.7                     |
| FSUT2-8A                  | 0.27                                      | 56                              | 04Aug2013, 15:50    | 24.3                      |
| FSUT2-8B                  | 0.06                                      | 50.9                            | 04Aug2013, 13:20    | 6.1                       |
| U/S Limit FSUT2-1         | 1.99                                      | 260.5                           | 04Aug2013, 16:55    | 161.1                     |
| RT FSUT2-8A-8B            | 1.99                                      | 260.4                           | 04Aug2013, 17:05    | 160.3                     |
| FSUT2-9B                  | 0.11                                      | 35.8                            | 04Aug2013, 14:25    | 9.9                       |
| FSUT2-9A                  | 0.10                                      | 73.5                            | 04Aug2013, 13:20    | 8.9                       |
| ADD FSUT2-9A-9B           | 2.20                                      | 276.1                           | 04Aug2013, 16:55    | 179.1                     |
| RT FSUT2-9A-9B            | 2.20                                      | 276.1                           | 04Aug2013, 18:25    | 169.5                     |
| ADD FSUT2                 | 7.35                                      | 757                             | 04Aug2013, 20:35    | 589.2                     |
| FSUT1-2A                  | 0.45                                      | 29                              | 04Aug2013, 21:00    | 18.9                      |
| FSUT1-2B                  | 0.24                                      | 33.2                            | 04Aug2013, 17:10    | 18                        |
| ADD FSUT1-2A-2B           | 0.69                                      | 52.2                            | 04Aug2013, 18:20    | 36.9                      |
| FSUT1-2D                  | 0.18                                      | 47.9                            | 04Aug2013, 14:40    | 15.1                      |
| FSUT1-2C                  | 0.11                                      | 58.3                            | 04Aug2013, 13:25    | 8                         |
| RT FSUT1-2C               | 0.11                                      | 42.2                            | 04Aug2013, 13:50    | 7.8                       |
| ADD FSUT1-2D              | 0.98                                      | 81.8                            | 04Aug2013, 14:25    | 59.8                      |
| RT-FSUT1-2D               | 0.98                                      | 81                              | 04Aug2013, 14:45    | 58.7                      |
| FSUT1-2E                  | 0.17                                      | 128.4                           | 04Aug2013, 13:20    | 15.5                      |
| ADD FSUT1-2E              | 1.15                                      | 134.1                           | 04Aug2013, 13:20    | 74.1                      |
| RT FSUT1-2E               | 1.15                                      | 120.6                           | 04Aug2013, 13:25    | 73.7                      |
| FSUT1-2F                  | 0.11                                      | 22.7                            | 04Aug2013, 14:55    | 7.8                       |
| ADD FSUT1-2F              | 1.26                                      | 124.7                           | 04Aug2013, 13:25    | 81.4                      |
| RT FSUT1-2F               | 1.26                                      | 121.9                           | 04Aug2013, 14:45    | 81.2                      |
| FSUT1-1A                  | 0.40                                      | 36.4                            | 04Aug2013, 20:00    | 23.7                      |
| FSUT1-1B                  | 0.39                                      | 54.2                            | 04Aug2013, 18:20    | 33                        |
| RT FSUT1-1A-1B            | 0.80                                      | 87.6                            | 04Aug2013, 19:20    | 54.9                      |
| FSUT1-1C                  | 0.27                                      | 41.1                            | 04Aug2013, 15:55    | 18.3                      |
| U/S Limit FSUT1           | 1.07                                      | 107.3                           | 04Aug2013, 18:40    | 73.2                      |
| FSUT1-2G                  | 0.09                                      | 52.3                            | 04Aug2013, 13:50    | 10.4                      |
| Trafalgar Drive           | 1.16                                      | 111.4                           | 04Aug2013, 18:45    | 82.3                      |
| Corey Road - FSUT1        | 2.41                                      | 194.5                           | 04Aug2013, 17:50    | 163.1                     |
| FSUT1-3                   | 0.19                                      | 26.2                            | 04Aug2013, 14:50    | 9.1                       |
| ADD FSUT1-3               | 2.60                                      | 208.9                           | 04Aug2013, 15:00    | 172.3                     |
| RT FSUT1                  | 2.60                                      | 208.9                           | 04Aug2013, 21:20    | 98.9                      |
| FS-10C                    | 0.10                                      | 22.3                            | 04Aug2013, 14:55    | 7.5                       |
| ADD FSUT1                 | 10.05                                     | 962.9                           | 04Aug2013, 20:45    | 695.6                     |



**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR EXISTING</b>    |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FS-10                  | 10.05                                     | 959.9                           | 04Aug2013, 20:50    | 691.1                     |
| FS-10D                    | 0.18                                      | 49.5                            | 04Aug2013, 14:55    | 16.6                      |
| FS-10B                    | 0.15                                      | 41.8                            | 04Aug2013, 14:10    | 10.4                      |
| FS-10A                    | 0.03                                      | 13.7                            | 04Aug2013, 14:10    | 3.4                       |
| RT FS-10A                 | 0.03                                      | 13.5                            | 04Aug2013, 14:40    | 3.4                       |
| ADD FS-10B-10C-10D        | 10.42                                     | 971.5                           | 04Aug2013, 20:50    | 721.5                     |
| RT FS-10B-10D             | 10.42                                     | 969.7                           | 04Aug2013, 20:55    | 718.5                     |
| FS-10F                    | 0.15                                      | 38.9                            | 04Aug2013, 13:45    | 7.7                       |
| FS-10E                    | 0.07                                      | 30.4                            | 04Aug2013, 13:35    | 5                         |
| ADD FS-10E-10F            | 10.64                                     | 974.2                           | 04Aug2013, 20:55    | 731.2                     |
| RT FS-10E-10F             | 10.64                                     | 969.2                           | 04Aug2013, 21:00    | 724.3                     |
| OUTLET                    | 10.64                                     | 969.2                           | 04Aug2013, 21:00    | 724.3                     |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR EXISTING</b>      |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 61.4                            | 04Aug2013, 15:10    | 23                        |
| FSUT3-1B                     | 0.10                                      | 83.4                            | 04Aug2013, 13:55    | 17.6                      |
| FSUT3-1C                     | 0.09                                      | 44.7                            | 04Aug2013, 14:40    | 13.8                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 157                             | 04Aug2013, 14:15    | 54.4                      |
| FSUT3-1D                     | 0.17                                      | 74.9                            | 04Aug2013, 15:45    | 32.2                      |
| RT FSUT3-1D                  | 0.17                                      | 74.9                            | 04Aug2013, 15:45    | 32.2                      |
| FSUT3-1E                     | 0.04                                      | 42.9                            | 04Aug2013, 13:25    | 5.7                       |
| U/S Limit FSUT3              | 0.49                                      | 213.2                           | 04Aug2013, 14:45    | 92.4                      |
| RT FSUT3-1E                  | 0.49                                      | 212.7                           | 04Aug2013, 14:50    | 92                        |
| FSUT3-2A                     | 0.08                                      | 24.6                            | 04Aug2013, 15:20    | 9.5                       |
| ADD FSUT3-2A                 | 0.58                                      | 235.7                           | 04Aug2013, 14:55    | 101.5                     |
| RT FSUT3-2A                  | 0.58                                      | 235.4                           | 04Aug2013, 15:00    | 101.3                     |
| FSUT3-2B                     | 0.11                                      | 41.8                            | 04Aug2013, 15:15    | 15.7                      |
| ADD FSUT3-2B                 | 0.69                                      | 276.6                           | 04Aug2013, 15:05    | 117                       |
| RT FSUT3-2B                  | 0.69                                      | 275                             | 04Aug2013, 15:10    | 116.3                     |
| FSUT3-3                      | 0.09                                      | 137.7                           | 04Aug2013, 13:20    | 16.5                      |
| ADD FSUT3-3                  | 0.78                                      | 290.1                           | 04Aug2013, 15:10    | 132.9                     |
| Coleman Drive                | 0.78                                      | 290.2                           | 04Aug2013, 15:10    | 132.9                     |
| FSUT3-5                      | 0.16                                      | 112.6                           | 04Aug2013, 14:35    | 34.9                      |
| Country Home Road            | 0.16                                      | 112.6                           | 04Aug2013, 14:35    | 34.9                      |
| RT FSUT3-5                   | 0.16                                      | 112.6                           | 04Aug2013, 14:35    | 34.9                      |
| FSUT3-6                      | 0.11                                      | 57.6                            | 04Aug2013, 14:40    | 17.8                      |
| ADD FSUT3-6                  | 0.27                                      | 170                             | 04Aug2013, 14:40    | 52.6                      |
| East Fire Tower Road - North | 0.27                                      | 162.5                           | 04Aug2013, 14:55    | 52.6                      |
| FSUT3-4C                     | 0.13                                      | 45.4                            | 04Aug2013, 16:20    | 21.8                      |
| FSUT3-4B                     | 0.07                                      | 72.3                            | 04Aug2013, 13:55    | 15.5                      |
| FSUT3-4A                     | 0.07                                      | 25.2                            | 04Aug2013, 16:20    | 12.2                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 92                              | 04Aug2013, 14:00    | 49.5                      |
| RT FSUT3-4C                  | 0.27                                      | 91.7                            | 04Aug2013, 14:10    | 49.3                      |
| FSUT3-4D                     | 0.08                                      | 152.6                           | 04Aug2013, 13:15    | 18.5                      |
| ADD FSUT3-4D                 | 0.62                                      | 263.2                           | 04Aug2013, 14:35    | 120.5                     |
| Wimbledon Drive              | 0.62                                      | 260.2                           | 04Aug2013, 14:50    | 120.3                     |
| FSUT3-7                      | 0.14                                      | 55                              | 04Aug2013, 16:20    | 26.5                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 301.9                           | 04Aug2013, 15:20    | 146.8                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 591.5                           | 04Aug2013, 15:15    | 279.6                     |
| FSUT3-8                      | 0.08                                      | 73.7                            | 04Aug2013, 13:45    | 13.7                      |
| East Fire Tower - South      | 1.62                                      | 609.9                           | 04Aug2013, 15:15    | 293.2                     |
| FSUT3-9B                     | 0.16                                      | 44.5                            | 04Aug2013, 17:30    | 25.2                      |
| FSUT3-9A                     | 0.05                                      | 46.7                            | 04Aug2013, 14:05    | 11.1                      |
| RT FSUT3-9A                  | 0.05                                      | 45.7                            | 04Aug2013, 14:20    | 11                        |
| ADD FSUT3-9B                 | 0.22                                      | 57.7                            | 04Aug2013, 14:30    | 36.3                      |
| Corey Road - FSUT3           | 0.22                                      | 57.7                            | 04Aug2013, 14:30    | 36.3                      |
| FSUT3-9C                     | 0.16                                      | 68.4                            | 04Aug2013, 15:45    | 29.3                      |
| ADD FSUT3-9C                 | 1.99                                      | 725.4                           | 04Aug2013, 15:15    | 358.8                     |
| RT FSUT 3-9C                 | 1.99                                      | 723.9                           | 04Aug2013, 15:20    | 358                       |
| FSUT3-9D                     | 0.09                                      | 151.5                           | 04Aug2013, 13:15    | 18.3                      |
| ADD FSUT3-9D                 | 2.08                                      | 738.6                           | 04Aug2013, 15:20    | 376.3                     |
| RT FSUT3-9D                  | 2.08                                      | 736.8                           | 04Aug2013, 15:25    | 374.6                     |
| FSUT3-10A                    | 0.24                                      | 73.1                            | 04Aug2013, 16:55    | 38.6                      |
| ADD FSUT3-10A                | 2.32                                      | 791.9                           | 04Aug2013, 15:30    | 413.2                     |
| RT FSUT3-10A                 | 2.32                                      | 790.6                           | 04Aug2013, 15:35    | 412.2                     |
| FSUT3-10C                    | 0.22                                      | 69.7                            | 04Aug2013, 15:50    | 30.3                      |
| FSUT3-10B                    | 0.09                                      | 158.4                           | 04Aug2013, 13:15    | 19.2                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 873.3                           | 04Aug2013, 15:35    | 461.7                     |
| RT FSUT3                     | 2.63                                      | 873.3                           | 04Aug2013, 21:05    | 380.2                     |
| FS-1B                        | 0.13                                      | 89.5                            | 04Aug2013, 14:35    | 27.7                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR EXISTING</b>    |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FS-1A                      | 0.12                                      | 90.9                            | 04Aug2013, 14:35    | 28.4                      |
| RT FS-1A                   | 0.12                                      | 90.7                            | 04Aug2013, 14:40    | 28.4                      |
| ADD FS-1B                  | 0.25                                      | 180.1                           | 04Aug2013, 14:35    | 56.1                      |
| RT FS-1B                   | 0.25                                      | 179.2                           | 04Aug2013, 14:45    | 55.9                      |
| FS-2A                      | 0.16                                      | 95.4                            | 04Aug2013, 14:40    | 29.3                      |
| RT FS-2A                   | 0.16                                      | 95.1                            | 04Aug2013, 14:40    | 29.3                      |
| FS-2B                      | 0.08                                      | 112.2                           | 04Aug2013, 13:30    | 16.7                      |
| ADD FS-2B                  | 0.23                                      | 142.4                           | 04Aug2013, 13:30    | 46                        |
| RT FS-2B                   | 0.23                                      | 140.6                           | 04Aug2013, 13:35    | 45.9                      |
| ADD FS1-2                  | 0.48                                      | 296.1                           | 04Aug2013, 14:40    | 101.8                     |
| FS-3                       | 0.08                                      | 71                              | 04Aug2013, 14:05    | 16.8                      |
| East Baywood Lane          | 0.56                                      | 352.4                           | 04Aug2013, 14:30    | 118.6                     |
| U/S Limit FS               | 0.56                                      | 352.4                           | 04Aug2013, 14:30    | 118.6                     |
| FS-4B                      | 0.12                                      | 109.9                           | 04Aug2013, 14:05    | 26.3                      |
| FS-4A                      | 0.10                                      | 45.9                            | 04Aug2013, 15:45    | 19.7                      |
| RT FS-4A                   | 0.10                                      | 45.8                            | 04Aug2013, 15:50    | 19.7                      |
| ADD FS-4B                  | 0.22                                      | 129.3                           | 04Aug2013, 14:10    | 46                        |
| RT FS-4B                   | 0.22                                      | 124.7                           | 04Aug2013, 14:20    | 45.7                      |
| Railroad                   | 0.78                                      | 474.6                           | 04Aug2013, 14:30    | 164.2                     |
| FS-5                       | 0.05                                      | 78                              | 04Aug2013, 13:20    | 9.4                       |
| Evans Street               | 0.83                                      | 485.6                           | 04Aug2013, 14:30    | 173.3                     |
| FS-6A                      | 0.16                                      | 79.4                            | 04Aug2013, 15:40    | 34.2                      |
| FS-6B                      | 0.09                                      | 120.2                           | 04Aug2013, 13:25    | 16                        |
| RT FS-6A-6B                | 0.25                                      | 134.2                           | 04Aug2013, 13:30    | 50.1                      |
| FS-6E                      | 0.11                                      | 40.4                            | 04Aug2013, 15:45    | 17.4                      |
| FS-6D                      | 0.10                                      | 49.7                            | 04Aug2013, 15:10    | 18.4                      |
| ADD FS-6D-6E               | 0.20                                      | 88.1                            | 04Aug2013, 15:25    | 35.8                      |
| FS-6C                      | 0.15                                      | 92.3                            | 04Aug2013, 14:40    | 28.4                      |
| ADD FS-6C                  | 1.44                                      | 726.3                           | 04Aug2013, 14:40    | 287.6                     |
| FS-6F                      | 0.17                                      | 49.1                            | 04Aug2013, 17:25    | 27.8                      |
| ADD FS-6F                  | 1.60                                      | 744.3                           | 04Aug2013, 14:40    | 315.5                     |
| RT FS-6F                   | 1.60                                      | 736                             | 04Aug2013, 14:50    | 314.1                     |
| FS-7A                      | 0.15                                      | 249.2                           | 04Aug2013, 13:15    | 30.1                      |
| ADD FS-7A                  | 1.75                                      | 766.2                           | 04Aug2013, 14:45    | 344.2                     |
| RT FS-7A                   | 1.75                                      | 765.5                           | 04Aug2013, 14:50    | 343.7                     |
| FS-7B                      | 0.15                                      | 79.9                            | 04Aug2013, 14:40    | 24.6                      |
| ADD FS-7B                  | 1.90                                      | 844.1                           | 04Aug2013, 14:50    | 368.4                     |
| E Fire Tower Road (Bridge) | 1.90                                      | 844.1                           | 04Aug2013, 14:50    | 368.4                     |
| RT FS-7B                   | 1.90                                      | 838.6                           | 04Aug2013, 14:55    | 367                       |
| FS-8E                      | 0.12                                      | 104.2                           | 04Aug2013, 13:40    | 17.9                      |
| ADD FS8-E                  | 2.03                                      | 867.3                           | 04Aug2013, 14:50    | 384.9                     |
| RT FS-8E                   | 2.03                                      | 866.3                           | 04Aug2013, 14:55    | 384.5                     |
| FS-8B                      | 0.13                                      | 59.5                            | 04Aug2013, 15:00    | 20.9                      |
| FS-8C                      | 0.09                                      | 110.4                           | 04Aug2013, 13:35    | 17.6                      |
| FS-8A                      | 0.06                                      | 22.8                            | 04Aug2013, 16:20    | 11                        |
| ADD FS-8A-8B-8C            | 0.28                                      | 133.1                           | 04Aug2013, 13:35    | 49.5                      |
| RT FS-8C                   | 0.28                                      | 132.4                           | 04Aug2013, 13:45    | 49.4                      |
| FS-8D                      | 0.07                                      | 93.5                            | 04Aug2013, 13:20    | 11.2                      |
| ADD FS-8D                  | 2.38                                      | 976.3                           | 04Aug2013, 14:50    | 445.1                     |
| ADD FSUT3 to FS            | 5.01                                      | 1055                            | 04Aug2013, 20:55    | 825.2                     |
| FS-9                       | 0.14                                      | 74.9                            | 04Aug2013, 14:10    | 18.2                      |
| ADD FS-9                   | 5.15                                      | 1060.9                          | 04Aug2013, 20:55    | 843.4                     |
| RT FS-9                    | 5.15                                      | 1059.6                          | 04Aug2013, 21:00    | 840.3                     |
| FSUT2-3                    | 0.21                                      | 50.9                            | 04Aug2013, 17:35    | 28.9                      |
| FSUT2-1                    | 0.14                                      | 105.9                           | 04Aug2013, 14:00    | 23.8                      |
| U/S Limit FSUT2-2          | 0.14                                      | 105.9                           | 04Aug2013, 14:00    | 23.8                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR EXISTING</b>   |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 102.1                           | 04Aug2013, 14:10    | 23.6                      |
| FSUT2-2                   | 0.03                                      | 43.3                            | 04Aug2013, 13:20    | 5.2                       |
| ADD FSUT2-2               | 0.17                                      | 111.5                           | 04Aug2013, 14:05    | 28.8                      |
| RT FSUT2-2                | 0.17                                      | 110.7                           | 04Aug2013, 14:10    | 28.8                      |
| ADD FSUT2-3               | 0.38                                      | 120.3                           | 04Aug2013, 14:10    | 57.7                      |
| RT FSUT2-3                | 0.38                                      | 120.2                           | 04Aug2013, 14:15    | 57.6                      |
| FSUT2-4                   | 0.14                                      | 60.7                            | 04Aug2013, 15:45    | 26.3                      |
| ADD FSUT2-4               | 0.52                                      | 154.3                           | 04Aug2013, 14:25    | 83.9                      |
| RT FSUT2-4                | 0.52                                      | 153.6                           | 04Aug2013, 14:30    | 83.6                      |
| FSUT2-5                   | 0.21                                      | 71.8                            | 04Aug2013, 16:50    | 37.9                      |
| West Fire Tower Rd        | 0.73                                      | 201.4                           | 04Aug2013, 16:20    | 121.3                     |
| D/S Limit FSUT2-2         | 0.73                                      | 201.4                           | 04Aug2013, 16:20    | 121.3                     |
| FSUT2-6                   | 0.31                                      | 101                             | 04Aug2013, 17:25    | 57.4                      |
| ADD FSUT2-6               | 1.05                                      | 297                             | 04Aug2013, 16:45    | 178.7                     |
| RT FSUT2-6                | 1.05                                      | 296.7                           | 04Aug2013, 16:55    | 177.5                     |
| FSUT2-7A                  | 0.19                                      | 58.2                            | 04Aug2013, 16:55    | 30.7                      |
| ADD FSUT2-7A              | 1.24                                      | 354.9                           | 04Aug2013, 16:55    | 208.2                     |
| RT FSUT2-7A               | 1.24                                      | 354.4                           | 04Aug2013, 17:00    | 207.2                     |
| FSUT2-7B                  | 0.42                                      | 96.5                            | 04Aug2013, 18:35    | 60.3                      |
| ADD FSUT2-7B              | 1.66                                      | 438.5                           | 04Aug2013, 17:20    | 267.5                     |
| FSUT2-8A                  | 0.27                                      | 113.1                           | 04Aug2013, 15:45    | 48.6                      |
| FSUT2-8B                  | 0.06                                      | 96.4                            | 04Aug2013, 13:15    | 11.6                      |
| U/S Limit FSUT2-1         | 1.99                                      | 531                             | 04Aug2013, 16:50    | 327.7                     |
| RT FSUT2-8A-8B            | 1.99                                      | 530.8                           | 04Aug2013, 16:55    | 326.5                     |
| FSUT2-9B                  | 0.11                                      | 73.4                            | 04Aug2013, 14:20    | 20                        |
| FSUT2-9A                  | 0.10                                      | 148.2                           | 04Aug2013, 13:20    | 17.8                      |
| ADD FSUT2-9A-9B           | 2.20                                      | 561                             | 04Aug2013, 16:45    | 364.4                     |
| RT FSUT2-9A-9B            | 2.20                                      | 561                             | 04Aug2013, 18:15    | 347.1                     |
| ADD FSUT2                 | 7.35                                      | 1477.2                          | 04Aug2013, 20:40    | 1187.4                    |
| FSUT1-2A                  | 0.45                                      | 67.7                            | 04Aug2013, 20:40    | 44.5                      |
| FSUT1-2B                  | 0.24                                      | 70.5                            | 04Aug2013, 17:00    | 37.7                      |
| ADD FSUT1-2A-2B           | 0.69                                      | 116.2                           | 04Aug2013, 18:15    | 82.2                      |
| FSUT1-2D                  | 0.18                                      | 100.1                           | 04Aug2013, 14:40    | 30.8                      |
| FSUT1-2C                  | 0.11                                      | 130.1                           | 04Aug2013, 13:25    | 17.3                      |
| RT FSUT1-2C               | 0.11                                      | 98.2                            | 04Aug2013, 13:40    | 17                        |
| ADD FSUT1-2D              | 0.98                                      | 174.9                           | 04Aug2013, 14:15    | 130.1                     |
| RT-FSUT1-2D               | 0.98                                      | 172.7                           | 04Aug2013, 14:40    | 128.1                     |
| FSUT1-2E                  | 0.17                                      | 258.8                           | 04Aug2013, 13:20    | 31.1                      |
| ADD FSUT1-2E              | 1.15                                      | 310.3                           | 04Aug2013, 13:20    | 159.2                     |
| RT FSUT1-2E               | 1.15                                      | 285.8                           | 04Aug2013, 13:25    | 158.5                     |
| FSUT1-2F                  | 0.11                                      | 50.2                            | 04Aug2013, 14:50    | 16.6                      |
| ADD FSUT1-2F              | 1.26                                      | 298.3                           | 04Aug2013, 13:25    | 175.1                     |
| RT FSUT1-2F               | 1.26                                      | 289.2                           | 04Aug2013, 13:25    | 174.8                     |
| FSUT1-1A                  | 0.40                                      | 78                              | 04Aug2013, 19:45    | 51.2                      |
| FSUT1-1B                  | 0.39                                      | 107.5                           | 04Aug2013, 18:10    | 65.6                      |
| RT FSUT1-1A-1B            | 0.80                                      | 179.4                           | 04Aug2013, 19:05    | 113.9                     |
| FSUT1-1C                  | 0.27                                      | 92.5                            | 04Aug2013, 15:50    | 40                        |
| U/S Limit FSUT1           | 1.07                                      | 222.7                           | 04Aug2013, 18:20    | 153.8                     |
| FSUT1-2G                  | 0.09                                      | 96.7                            | 04Aug2013, 13:50    | 19.4                      |
| Trafalgar Drive           | 1.16                                      | 230.5                           | 04Aug2013, 18:20    | 171                       |
| Corey Road - FSUT1        | 2.41                                      | 410.4                           | 04Aug2013, 17:35    | 345.1                     |
| FSUT1-3                   | 0.19                                      | 70.4                            | 04Aug2013, 14:45    | 22.4                      |
| ADD FSUT1-3               | 2.60                                      | 462.3                           | 04Aug2013, 14:50    | 367.5                     |
| RT FSUT1                  | 2.60                                      | 462.3                           | 04Aug2013, 21:10    | 219.4                     |
| FS-10C                    | 0.10                                      | 49.3                            | 04Aug2013, 14:50    | 16.1                      |
| ADD FSUT1                 | 10.05                                     | 1936.8                          | 04Aug2013, 20:45    | 1422.9                    |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR EXISTING</b>   |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FS-10                  | 10.05                                     | 1931.9                          | 04Aug2013, 20:50    | 1415.5                    |
| FS-10D                    | 0.18                                      | 99.8                            | 04Aug2013, 14:50    | 33                        |
| FS-10B                    | 0.15                                      | 96.2                            | 04Aug2013, 14:05    | 22.9                      |
| FS-10A                    | 0.03                                      | 26.6                            | 04Aug2013, 14:10    | 6.6                       |
| RT FS-10A                 | 0.03                                      | 26.3                            | 04Aug2013, 14:30    | 6.5                       |
| ADD FS-10B-10C-10D        | 10.42                                     | 1952.6                          | 04Aug2013, 20:50    | 1478                      |
| RT FS-10B-10D             | 10.42                                     | 1949.2                          | 04Aug2013, 20:50    | 1473.1                    |
| FS-10F                    | 0.15                                      | 104                             | 04Aug2013, 13:40    | 18.8                      |
| FS-10E                    | 0.07                                      | 66.7                            | 04Aug2013, 13:35    | 10.6                      |
| ADD FS-10E-10F            | 10.64                                     | 1958                            | 04Aug2013, 20:50    | 1502.4                    |
| RT FS-10E-10F             | 10.64                                     | 1949.3                          | 04Aug2013, 20:55    | 1491                      |
| OUTLET                    | 10.64                                     | 1949.3                          | 04Aug2013, 20:55    | 1491                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>25-YEAR EXISTING</b>      |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 80.6                            | 04Aug2013, 15:05    | 30.4                      |
| FSUT3-1B                     | 0.10                                      | 113.6                           | 04Aug2013, 13:55    | 24.1                      |
| FSUT3-1C                     | 0.09                                      | 63.6                            | 04Aug2013, 14:40    | 19.6                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 214.9                           | 04Aug2013, 14:15    | 74                        |
| FSUT3-1D                     | 0.17                                      | 100.7                           | 04Aug2013, 15:40    | 43.4                      |
| RT FSUT3-1D                  | 0.17                                      | 100.7                           | 04Aug2013, 15:40    | 43.4                      |
| FSUT3-1E                     | 0.04                                      | 61                              | 04Aug2013, 13:25    | 8.1                       |
| U/S Limit FSUT3              | 0.49                                      | 289.8                           | 04Aug2013, 14:40    | 125.6                     |
| RT FSUT3-1E                  | 0.49                                      | 289.1                           | 04Aug2013, 14:45    | 125.1                     |
| FSUT3-2A                     | 0.08                                      | 37.3                            | 04Aug2013, 15:15    | 14.1                      |
| ADD FSUT3-2A                 | 0.58                                      | 323.9                           | 04Aug2013, 14:55    | 139.2                     |
| RT FSUT3-2A                  | 0.58                                      | 323.5                           | 04Aug2013, 14:55    | 139                       |
| FSUT3-2B                     | 0.11                                      | 60.3                            | 04Aug2013, 15:15    | 22.5                      |
| ADD FSUT3-2B                 | 0.69                                      | 382.8                           | 04Aug2013, 15:00    | 161.4                     |
| RT FSUT3-2B                  | 0.69                                      | 380.7                           | 04Aug2013, 15:10    | 160.6                     |
| FSUT3-3                      | 0.09                                      | 188.2                           | 04Aug2013, 13:15    | 22.7                      |
| ADD FSUT3-3                  | 0.78                                      | 401.2                           | 04Aug2013, 15:05    | 183.4                     |
| Coleman Drive                | 0.78                                      | 400.9                           | 04Aug2013, 15:05    | 183.3                     |
| FSUT3-5                      | 0.16                                      | 147.7                           | 04Aug2013, 14:35    | 46.1                      |
| Country Home Road            | 0.16                                      | 147.5                           | 04Aug2013, 14:40    | 46.1                      |
| RT FSUT3-5                   | 0.16                                      | 147.5                           | 04Aug2013, 14:40    | 46.1                      |
| FSUT3-6                      | 0.11                                      | 80.7                            | 04Aug2013, 14:40    | 24.8                      |
| ADD FSUT3-6                  | 0.27                                      | 228.2                           | 04Aug2013, 14:40    | 70.9                      |
| East Fire Tower Road - North | 0.27                                      | 202.3                           | 04Aug2013, 15:10    | 70.9                      |
| FSUT3-4C                     | 0.13                                      | 62.8                            | 04Aug2013, 16:20    | 30.3                      |
| FSUT3-4B                     | 0.07                                      | 94                              | 04Aug2013, 13:55    | 20.4                      |
| FSUT3-4A                     | 0.07                                      | 34.3                            | 04Aug2013, 16:15    | 16.6                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 123.7                           | 04Aug2013, 14:00    | 67.3                      |
| RT FSUT3-4C                  | 0.27                                      | 123.2                           | 04Aug2013, 14:10    | 67                        |
| FSUT3-4D                     | 0.08                                      | 200.8                           | 04Aug2013, 13:15    | 24.6                      |
| ADD FSUT3-4D                 | 0.62                                      | 331.2                           | 04Aug2013, 15:05    | 162.5                     |
| Wimbledon Drive              | 0.62                                      | 330.9                           | 04Aug2013, 15:10    | 162.3                     |
| FSUT3-7                      | 0.14                                      | 74.4                            | 04Aug2013, 16:15    | 35.9                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 391.6                           | 04Aug2013, 15:30    | 198.2                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 787.1                           | 04Aug2013, 15:20    | 381.5                     |
| FSUT3-8                      | 0.08                                      | 101.6                           | 04Aug2013, 13:45    | 18.9                      |
| East Fire Tower - South      | 1.62                                      | 810.1                           | 04Aug2013, 15:20    | 400.3                     |
| FSUT3-9B                     | 0.16                                      | 62.1                            | 04Aug2013, 17:25    | 35.2                      |
| FSUT3-9A                     | 0.05                                      | 61.8                            | 04Aug2013, 14:05    | 14.8                      |
| RT FSUT3-9A                  | 0.05                                      | 60.5                            | 04Aug2013, 14:20    | 14.7                      |
| ADD FSUT3-9B                 | 0.22                                      | 78.5                            | 04Aug2013, 14:25    | 49.9                      |
| Corey Road - FSUT3           | 0.22                                      | 78.5                            | 04Aug2013, 14:25    | 49.9                      |
| FSUT3-9C                     | 0.16                                      | 92.9                            | 04Aug2013, 15:45    | 40                        |
| ADD FSUT3-9C                 | 1.99                                      | 969.3                           | 04Aug2013, 15:20    | 490.2                     |
| RT FSUT 3-9C                 | 1.99                                      | 967.7                           | 04Aug2013, 15:25    | 489.2                     |
| FSUT3-9D                     | 0.09                                      | 201.5                           | 04Aug2013, 13:15    | 24.5                      |
| ADD FSUT3-9D                 | 2.08                                      | 986.2                           | 04Aug2013, 15:20    | 513.8                     |
| RT FSUT3-9D                  | 2.08                                      | 984.5                           | 04Aug2013, 15:30    | 512.1                     |
| FSUT3-10A                    | 0.24                                      | 102                             | 04Aug2013, 16:50    | 53.8                      |
| ADD FSUT3-10A                | 2.32                                      | 1065.5                          | 04Aug2013, 15:35    | 565.9                     |
| RT FSUT3-10A                 | 2.32                                      | 1064.2                          | 04Aug2013, 15:40    | 564.6                     |
| FSUT3-10C                    | 0.22                                      | 100.6                           | 04Aug2013, 15:45    | 43.3                      |
| FSUT3-10B                    | 0.09                                      | 208.3                           | 04Aug2013, 13:15    | 25.5                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 1182                            | 04Aug2013, 15:40    | 633.4                     |
| RT FSUT3                     | 2.63                                      | 1182                            | 04Aug2013, 21:10    | 526.3                     |
| FS-1B                        | 0.13                                      | 118.1                           | 04Aug2013, 14:35    | 36.7                      |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 25-YEAR EXISTING           |                                  |                      |                  |                |
|----------------------------|----------------------------------|----------------------|------------------|----------------|
| Hydrologic Element         | Drainage Area (mi <sup>2</sup> ) | Peak Discharge (CFS) | Time of Peak     | Volume (AC-FT) |
| FS-1A                      | 0.12                             | 117.4                | 04Aug2013, 14:35 | 37.1           |
| RT FS-1A                   | 0.12                             | 117.2                | 04Aug2013, 14:40 | 37.1           |
| ADD FS-1B                  | 0.25                             | 235.1                | 04Aug2013, 14:35 | 73.8           |
| RT FS-1B                   | 0.25                             | 233.9                | 04Aug2013, 14:40 | 73.6           |
| FS-2A                      | 0.16                             | 129.5                | 04Aug2013, 14:35 | 39.9           |
| RT FS-2A                   | 0.16                             | 129                  | 04Aug2013, 14:40 | 39.8           |
| FS-2B                      | 0.08                             | 147.2                | 04Aug2013, 13:30 | 22.2           |
| ADD FS-2B                  | 0.23                             | 191.5                | 04Aug2013, 13:30 | 62             |
| RT FS-2B                   | 0.23                             | 189.5                | 04Aug2013, 13:35 | 61.9           |
| ADD FS1-2                  | 0.48                             | 391.2                | 04Aug2013, 14:40 | 135.5          |
| FS-3                       | 0.08                             | 95.1                 | 04Aug2013, 14:05 | 22.7           |
| East Baywood Lane          | 0.56                             | 467.7                | 04Aug2013, 14:30 | 158.1          |
| U/S Limit FS               | 0.56                             | 467.7                | 04Aug2013, 14:30 | 158.1          |
| FS-4B                      | 0.12                             | 143.8                | 04Aug2013, 14:05 | 34.7           |
| FS-4A                      | 0.10                             | 61.4                 | 04Aug2013, 15:40 | 26.5           |
| RT FS-4A                   | 0.10                             | 61.3                 | 04Aug2013, 15:45 | 26.4           |
| ADD FS-4B                  | 0.22                             | 171                  | 04Aug2013, 14:10 | 61.2           |
| RT FS-4B                   | 0.22                             | 165.2                | 04Aug2013, 14:15 | 60.9           |
| Railroad                   | 0.78                             | 629.3                | 04Aug2013, 14:30 | 218.9          |
| FS-5                       | 0.05                             | 106.6                | 04Aug2013, 13:15 | 12.9           |
| Evans Street               | 0.83                             | 641.9                | 04Aug2013, 14:35 | 231.3          |
| FS-6A                      | 0.16                             | 104.9                | 04Aug2013, 15:40 | 45.5           |
| FS-6B                      | 0.09                             | 165.1                | 04Aug2013, 13:25 | 22.1           |
| RT FS-6A-6B                | 0.25                             | 185.7                | 04Aug2013, 13:30 | 67.4           |
| FS-6E                      | 0.11                             | 56.3                 | 04Aug2013, 15:45 | 24.2           |
| FS-6D                      | 0.10                             | 67.5                 | 04Aug2013, 15:10 | 25.1           |
| ADD FS-6D-6E               | 0.20                             | 121.2                | 04Aug2013, 15:20 | 49.3           |
| FS-6C                      | 0.15                             | 125.3                | 04Aug2013, 14:35 | 38.6           |
| ADD FS-6C                  | 1.44                             | 973.1                | 04Aug2013, 14:40 | 386.6          |
| FS-6F                      | 0.17                             | 67.2                 | 04Aug2013, 17:25 | 38.2           |
| ADD FS-6F                  | 1.60                             | 1000                 | 04Aug2013, 14:45 | 424.9          |
| RT FS-6F                   | 1.60                             | 990.3                | 04Aug2013, 14:50 | 423.3          |
| FS-7A                      | 0.15                             | 333.5                | 04Aug2013, 13:15 | 40.5           |
| ADD FS-7A                  | 1.75                             | 1029.3               | 04Aug2013, 14:45 | 463.8          |
| RT FS-7A                   | 1.75                             | 1028.5               | 04Aug2013, 14:50 | 463.2          |
| FS-7B                      | 0.15                             | 111.9                | 04Aug2013, 14:40 | 34.4           |
| ADD FS-7B                  | 1.90                             | 1138.2               | 04Aug2013, 14:50 | 497.6          |
| E Fire Tower Road (Bridge) | 1.90                             | 1138.2               | 04Aug2013, 14:50 | 497.6          |
| RT FS-7B                   | 1.90                             | 1131.4               | 04Aug2013, 14:55 | 496            |
| FS-8E                      | 0.12                             | 149.6                | 04Aug2013, 13:40 | 25.5           |
| ADD FS8-E                  | 2.03                             | 1171.9               | 04Aug2013, 14:50 | 521.5          |
| RT FS-8E                   | 2.03                             | 1170.7               | 04Aug2013, 14:50 | 521            |
| FS-8B                      | 0.13                             | 82.9                 | 04Aug2013, 15:00 | 29.1           |
| FS-8C                      | 0.09                             | 150                  | 04Aug2013, 13:35 | 24.1           |
| FS-8A                      | 0.06                             | 31.4                 | 04Aug2013, 16:15 | 15.1           |
| ADD FS-8A-8B-8C            | 0.28                             | 184.5                | 04Aug2013, 13:35 | 68.3           |
| RT FS-8C                   | 0.28                             | 183                  | 04Aug2013, 13:45 | 68.1           |
| FS-8D                      | 0.07                             | 130.9                | 04Aug2013, 13:20 | 15.7           |
| ADD FS-8D                  | 2.38                             | 1322.6               | 04Aug2013, 14:50 | 604.8          |
| ADD FSUT3 to FS            | 5.01                             | 1414.4               | 04Aug2013, 21:00 | 1131.1         |
| FS-9                       | 0.14                             | 110.5                | 04Aug2013, 14:05 | 26.4           |
| ADD FS-9                   | 5.15                             | 1422.3               | 04Aug2013, 21:00 | 1157.5         |
| RT FS-9                    | 5.15                             | 1421.2               | 04Aug2013, 21:00 | 1153.8         |
| FSUT2-3                    | 0.21                             | 72.9                 | 04Aug2013, 17:30 | 41.3           |
| FSUT2-1                    | 0.14                             | 146.2                | 04Aug2013, 14:00 | 32.8           |
| U/S Limit FSUT2-2          | 0.14                             | 146.2                | 04Aug2013, 14:00 | 32.8           |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>25-YEAR EXISTING</b>   |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 140.8                           | 04Aug2013, 14:05    | 32.6                      |
| FSUT2-2                   | 0.03                                      | 60.2                            | 04Aug2013, 13:20    | 7.2                       |
| ADD FSUT2-2               | 0.17                                      | 154                             | 04Aug2013, 14:05    | 39.9                      |
| RT FSUT2-2                | 0.17                                      | 153.2                           | 04Aug2013, 14:05    | 39.8                      |
| ADD FSUT2-3               | 0.38                                      | 168.4                           | 04Aug2013, 14:10    | 81.1                      |
| RT FSUT2-3                | 0.38                                      | 168                             | 04Aug2013, 14:10    | 81                        |
| FSUT2-4                   | 0.14                                      | 82.1                            | 04Aug2013, 15:45    | 35.6                      |
| ADD FSUT2-4               | 0.52                                      | 214.2                           | 04Aug2013, 14:25    | 116.7                     |
| RT FSUT2-4                | 0.52                                      | 213.4                           | 04Aug2013, 14:30    | 116.3                     |
| FSUT2-5                   | 0.21                                      | 97.7                            | 04Aug2013, 16:50    | 51.7                      |
| West Fire Tower Rd        | 0.73                                      | 276.4                           | 04Aug2013, 16:25    | 167.7                     |
| D/S Limit FSUT2-2         | 0.73                                      | 276.4                           | 04Aug2013, 16:25    | 167.7                     |
| FSUT2-6                   | 0.31                                      | 135.9                           | 04Aug2013, 17:20    | 77.6                      |
| ADD FSUT2-6               | 1.05                                      | 406                             | 04Aug2013, 16:45    | 245.3                     |
| RT FSUT2-6                | 1.05                                      | 405.5                           | 04Aug2013, 16:55    | 243.9                     |
| FSUT2-7A                  | 0.19                                      | 81.1                            | 04Aug2013, 16:50    | 42.8                      |
| ADD FSUT2-7A              | 1.24                                      | 486.6                           | 04Aug2013, 16:55    | 286.6                     |
| RT FSUT2-7A               | 1.24                                      | 486                             | 04Aug2013, 17:00    | 285.4                     |
| FSUT2-7B                  | 0.42                                      | 134.6                           | 04Aug2013, 18:35    | 84.4                      |
| ADD FSUT2-7B              | 1.66                                      | 604.1                           | 04Aug2013, 17:15    | 369.8                     |
| FSUT2-8A                  | 0.27                                      | 154.7                           | 04Aug2013, 15:45    | 66.5                      |
| FSUT2-8B                  | 0.06                                      | 129.1                           | 04Aug2013, 13:15    | 15.7                      |
| U/S Limit FSUT2-1         | 1.99                                      | 730.4                           | 04Aug2013, 16:45    | 452                       |
| RT FSUT2-8A-8B            | 1.99                                      | 730.2                           | 04Aug2013, 16:50    | 450.4                     |
| FSUT2-9B                  | 0.11                                      | 100.8                           | 04Aug2013, 14:20    | 27.5                      |
| FSUT2-9A                  | 0.10                                      | 202.6                           | 04Aug2013, 13:15    | 24.4                      |
| ADD FSUT2-9A-9B           | 2.20                                      | 770.6                           | 04Aug2013, 16:40    | 502.4                     |
| RT FSUT2-9A-9B            | 2.20                                      | 770.6                           | 04Aug2013, 18:10    | 479.6                     |
| ADD FSUT2                 | 7.35                                      | 2003.1                          | 04Aug2013, 20:10    | 1633.4                    |
| FSUT1-2A                  | 0.45                                      | 98                              | 04Aug2013, 20:30    | 64.9                      |
| FSUT1-2B                  | 0.24                                      | 98.3                            | 04Aug2013, 17:00    | 52.5                      |
| ADD FSUT1-2A-2B           | 0.69                                      | 165.6                           | 04Aug2013, 18:10    | 117.4                     |
| FSUT1-2D                  | 0.18                                      | 138.4                           | 04Aug2013, 14:40    | 42.6                      |
| FSUT1-2C                  | 0.11                                      | 183.7                           | 04Aug2013, 13:25    | 24.5                      |
| RT FSUT1-2C               | 0.11                                      | 140.3                           | 04Aug2013, 13:40    | 24.1                      |
| ADD FSUT1-2D              | 0.98                                      | 244.8                           | 04Aug2013, 14:05    | 184.1                     |
| RT-FSUT1-2D               | 0.98                                      | 241.7                           | 04Aug2013, 14:35    | 181.7                     |
| FSUT1-2E                  | 0.17                                      | 353.7                           | 04Aug2013, 13:15    | 42.7                      |
| ADD FSUT1-2E              | 1.15                                      | 447                             | 04Aug2013, 13:20    | 224.4                     |
| RT FSUT1-2E               | 1.15                                      | 414.8                           | 04Aug2013, 13:25    | 223.5                     |
| FSUT1-2F                  | 0.11                                      | 70.9                            | 04Aug2013, 14:50    | 23.3                      |
| ADD FSUT1-2F              | 1.26                                      | 434.4                           | 04Aug2013, 13:25    | 246.8                     |
| RT FSUT1-2F               | 1.26                                      | 422.9                           | 04Aug2013, 13:25    | 246.4                     |
| FSUT1-1A                  | 0.40                                      | 109.3                           | 04Aug2013, 19:40    | 72.2                      |
| FSUT1-1B                  | 0.39                                      | 146.3                           | 04Aug2013, 18:10    | 89.7                      |
| RT FSUT1-1A-1B            | 0.80                                      | 247.6                           | 04Aug2013, 19:00    | 158.3                     |
| FSUT1-1C                  | 0.27                                      | 131.6                           | 04Aug2013, 15:45    | 56.6                      |
| U/S Limit FSUT1           | 1.07                                      | 309                             | 04Aug2013, 18:10    | 214.9                     |
| FSUT1-2G                  | 0.09                                      | 127.9                           | 04Aug2013, 13:50    | 25.8                      |
| Trafalgar Drive           | 1.16                                      | 319.1                           | 04Aug2013, 18:15    | 237.9                     |
| Corey Road - FSUT1        | 2.41                                      | 577                             | 04Aug2013, 17:00    | 483.3                     |
| FSUT1-3                   | 0.19                                      | 105.9                           | 04Aug2013, 14:40    | 33                        |
| ADD FSUT1-3               | 2.60                                      | 651                             | 04Aug2013, 14:45    | 516.3                     |
| RT FSUT1                  | 2.60                                      | 651                             | 04Aug2013, 21:05    | 314.9                     |
| FS-10C                    | 0.10                                      | 69.6                            | 04Aug2013, 14:45    | 22.6                      |
| ADD FSUT1                 | 10.05                                     | 2637.4                          | 04Aug2013, 20:40    | 1970.9                    |



City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 25-YEAR EXISTING   |                                     |                         |                  |                   |
|--------------------|-------------------------------------|-------------------------|------------------|-------------------|
| Hydrologic Element | Drainage Area<br>(mi <sup>2</sup> ) | Peak Discharge<br>(CFS) | Time of Peak     | Volume<br>(AC-FT) |
| RT FS-10           | 10.05                               | 2632.9                  | 04Aug2013, 20:45 | 1961.7            |
| FS-10D             | 0.18                                | 136.4                   | 04Aug2013, 14:50 | 45.2              |
| FS-10B             | 0.15                                | 137.7                   | 04Aug2013, 14:05 | 32.5              |
| FS-10A             | 0.03                                | 35.8                    | 04Aug2013, 14:10 | 8.9               |
| RT FS-10A          | 0.03                                | 35.5                    | 04Aug2013, 14:30 | 8.8               |
| ADD FS-10B-10C-10D | 10.42                               | 2660.4                  | 04Aug2013, 20:45 | 2048.2            |
| RT FS-10B-10D      | 10.42                               | 2657.4                  | 04Aug2013, 20:45 | 2042.1            |
| FS-10F             | 0.15                                | 156.4                   | 04Aug2013, 13:40 | 27.6              |
| FS-10E             | 0.07                                | 93.6                    | 04Aug2013, 13:35 | 14.8              |
| ADD FS-10E-10F     | 10.64                               | 2669.3                  | 04Aug2013, 20:45 | 2084.5            |
| RT FS-10E-10F      | 10.64                               | 2659.7                  | 04Aug2013, 20:50 | 2070.2            |
| OUTLET             | 10.64                               | 2659.7                  | 04Aug2013, 20:50 | 2070.2            |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR EXISTING</b>      |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 97.5                            | 04Aug2013, 15:05    | 36.9                      |
| FSUT3-1B                     | 0.10                                      | 140.3                           | 04Aug2013, 13:55    | 29.9                      |
| FSUT3-1C                     | 0.09                                      | 80.5                            | 04Aug2013, 14:40    | 24.8                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 266.2                           | 04Aug2013, 14:15    | 91.6                      |
| FSUT3-1D                     | 0.17                                      | 123.4                           | 04Aug2013, 15:40    | 53.4                      |
| RT FSUT3-1D                  | 0.17                                      | 123.4                           | 04Aug2013, 15:40    | 53.4                      |
| FSUT3-1E                     | 0.04                                      | 77.3                            | 04Aug2013, 13:25    | 10.3                      |
| U/S Limit FSUT3              | 0.49                                      | 357.9                           | 04Aug2013, 14:35    | 155.3                     |
| RT FSUT3-1E                  | 0.49                                      | 357                             | 04Aug2013, 14:40    | 154.8                     |
| FSUT3-2A                     | 0.08                                      | 49.2                            | 04Aug2013, 15:15    | 18.4                      |
| ADD FSUT3-2A                 | 0.58                                      | 402.7                           | 04Aug2013, 14:50    | 173.2                     |
| RT FSUT3-2A                  | 0.58                                      | 402.3                           | 04Aug2013, 14:55    | 172.9                     |
| FSUT3-2B                     | 0.11                                      | 77.2                            | 04Aug2013, 15:10    | 28.7                      |
| ADD FSUT3-2B                 | 0.69                                      | 477.9                           | 04Aug2013, 15:00    | 201.6                     |
| RT FSUT3-2B                  | 0.69                                      | 475.6                           | 04Aug2013, 15:05    | 200.8                     |
| FSUT3-3                      | 0.09                                      | 233.4                           | 04Aug2013, 13:15    | 28.3                      |
| ADD FSUT3-3                  | 0.78                                      | 500.5                           | 04Aug2013, 15:00    | 229.1                     |
| Coleman Drive                | 0.78                                      | 500.4                           | 04Aug2013, 15:05    | 229                       |
| FSUT3-5                      | 0.16                                      | 178.3                           | 04Aug2013, 14:35    | 56                        |
| Country Home Road            | 0.16                                      | 178                             | 04Aug2013, 14:40    | 56                        |
| RT FSUT3-5                   | 0.16                                      | 178                             | 04Aug2013, 14:40    | 56                        |
| FSUT3-6                      | 0.11                                      | 101.4                           | 04Aug2013, 14:35    | 31.2                      |
| ADD FSUT3-6                  | 0.27                                      | 279.4                           | 04Aug2013, 14:40    | 87.2                      |
| East Fire Tower Road - North | 0.27                                      | 250.4                           | 04Aug2013, 15:05    | 87.2                      |
| FSUT3-4C                     | 0.13                                      | 78.5                            | 04Aug2013, 16:15    | 37.8                      |
| FSUT3-4B                     | 0.07                                      | 113                             | 04Aug2013, 13:55    | 24.8                      |
| FSUT3-4A                     | 0.07                                      | 42.4                            | 04Aug2013, 16:15    | 20.5                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 151.8                           | 04Aug2013, 14:00    | 83.1                      |
| RT FSUT3-4C                  | 0.27                                      | 151.2                           | 04Aug2013, 14:10    | 82.8                      |
| FSUT3-4D                     | 0.08                                      | 242.7                           | 04Aug2013, 13:15    | 30                        |
| ADD FSUT3-4D                 | 0.62                                      | 409.2                           | 04Aug2013, 15:05    | 200.1                     |
| Wimbledon Drive              | 0.62                                      | 408.8                           | 04Aug2013, 15:10    | 199.8                     |
| FSUT3-7                      | 0.14                                      | 91.5                            | 04Aug2013, 16:15    | 44.4                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 486.6                           | 04Aug2013, 15:25    | 244.1                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 981.6                           | 04Aug2013, 15:15    | 473.1                     |
| FSUT3-8                      | 0.08                                      | 126.3                           | 04Aug2013, 13:45    | 23.6                      |
| East Fire Tower - South      | 1.62                                      | 1011.5                          | 04Aug2013, 15:15    | 496.6                     |
| FSUT3-9B                     | 0.16                                      | 77.9                            | 04Aug2013, 17:25    | 44.3                      |
| FSUT3-9A                     | 0.05                                      | 75                              | 04Aug2013, 14:05    | 18.1                      |
| RT FSUT3-9A                  | 0.05                                      | 73.3                            | 04Aug2013, 14:20    | 18                        |
| ADD FSUT3-9B                 | 0.22                                      | 97.1                            | 04Aug2013, 14:25    | 62.3                      |
| Corey Road - FSUT3           | 0.22                                      | 97.1                            | 04Aug2013, 14:25    | 62.3                      |
| FSUT3-9C                     | 0.16                                      | 114.7                           | 04Aug2013, 15:40    | 49.5                      |
| ADD FSUT3-9C                 | 1.99                                      | 1207.7                          | 04Aug2013, 15:15    | 608.3                     |
| RT FSUT 3-9C                 | 1.99                                      | 1205.5                          | 04Aug2013, 15:20    | 607.2                     |
| FSUT3-9D                     | 0.09                                      | 245.2                           | 04Aug2013, 13:15    | 30.1                      |
| ADD FSUT3-9D                 | 2.08                                      | 1228                            | 04Aug2013, 15:20    | 637.2                     |
| RT FSUT3-9D                  | 2.08                                      | 1225.3                          | 04Aug2013, 15:25    | 635.2                     |
| FSUT3-10A                    | 0.24                                      | 127.9                           | 04Aug2013, 16:50    | 67.6                      |
| ADD FSUT3-10A                | 2.32                                      | 1324.8                          | 04Aug2013, 15:30    | 702.7                     |
| RT FSUT3-10A                 | 2.32                                      | 1322.8                          | 04Aug2013, 15:35    | 701.2                     |
| FSUT3-10C                    | 0.22                                      | 128.8                           | 04Aug2013, 15:45    | 55.3                      |
| FSUT3-10B                    | 0.09                                      | 251.7                           | 04Aug2013, 13:15    | 31.1                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 1472                            | 04Aug2013, 15:35    | 787.6                     |
| RT FSUT3                     | 2.63                                      | 1472                            | 04Aug2013, 21:05    | 658.3                     |
| FS-1B                        | 0.13                                      | 143                             | 04Aug2013, 14:35    | 44.8                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR EXISTING</b>    |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FS-1A                      | 0.12                                      | 140.4                           | 04Aug2013, 14:35    | 44.7                      |
| RT FS-1A                   | 0.12                                      | 140.1                           | 04Aug2013, 14:35    | 44.7                      |
| ADD FS-1B                  | 0.25                                      | 283.1                           | 04Aug2013, 14:35    | 89.5                      |
| RT FS-1B                   | 0.25                                      | 281.6                           | 04Aug2013, 14:40    | 89.3                      |
| FS-2A                      | 0.16                                      | 159.7                           | 04Aug2013, 14:35    | 49.4                      |
| RT FS-2A                   | 0.16                                      | 159.2                           | 04Aug2013, 14:40    | 49.3                      |
| FS-2B                      | 0.08                                      | 177.7                           | 04Aug2013, 13:30    | 27                        |
| ADD FS-2B                  | 0.23                                      | 234.7                           | 04Aug2013, 13:30    | 76.3                      |
| RT FS-2B                   | 0.23                                      | 232.2                           | 04Aug2013, 13:35    | 76.2                      |
| ADD FS1-2                  | 0.48                                      | 474.7                           | 04Aug2013, 14:35    | 165.5                     |
| FS-3                       | 0.08                                      | 116.2                           | 04Aug2013, 14:05    | 27.9                      |
| East Baywood Lane          | 0.56                                      | 569.1                           | 04Aug2013, 14:30    | 193.2                     |
| U/S Limit FS               | 0.56                                      | 569.1                           | 04Aug2013, 14:30    | 193.2                     |
| FS-4B                      | 0.12                                      | 173.4                           | 04Aug2013, 14:05    | 42.2                      |
| FS-4A                      | 0.10                                      | 75                              | 04Aug2013, 15:40    | 32.5                      |
| RT FS-4A                   | 0.10                                      | 74.8                            | 04Aug2013, 15:45    | 32.5                      |
| ADD FS-4B                  | 0.22                                      | 207.6                           | 04Aug2013, 14:10    | 74.6                      |
| RT FS-4B                   | 0.22                                      | 200.6                           | 04Aug2013, 14:15    | 74.3                      |
| Railroad                   | 0.78                                      | 765.1                           | 04Aug2013, 14:30    | 267.4                     |
| FS-5                       | 0.05                                      | 132.2                           | 04Aug2013, 13:15    | 16                        |
| Evans Street               | 0.83                                      | 783.6                           | 04Aug2013, 14:30    | 283                       |
| FS-6A                      | 0.16                                      | 127.2                           | 04Aug2013, 15:40    | 55.5                      |
| FS-6B                      | 0.09                                      | 204.8                           | 04Aug2013, 13:25    | 27.6                      |
| RT FS-6A-6B                | 0.25                                      | 231.6                           | 04Aug2013, 13:30    | 82.9                      |
| FS-6E                      | 0.11                                      | 70.5                            | 04Aug2013, 15:45    | 30.3                      |
| FS-6D                      | 0.10                                      | 83.3                            | 04Aug2013, 15:10    | 31.1                      |
| ADD FS-6D-6E               | 0.20                                      | 150.7                           | 04Aug2013, 15:20    | 61.4                      |
| FS-6C                      | 0.15                                      | 154.5                           | 04Aug2013, 14:35    | 47.8                      |
| ADD FS-6C                  | 1.44                                      | 1186.4                          | 04Aug2013, 14:40    | 475                       |
| FS-6F                      | 0.17                                      | 83.3                            | 04Aug2013, 17:20    | 47.6                      |
| ADD FS-6F                  | 1.60                                      | 1220.4                          | 04Aug2013, 14:40    | 522.6                     |
| RT FS-6F                   | 1.60                                      | 1208.8                          | 04Aug2013, 14:45    | 520.7                     |
| FS-7A                      | 0.15                                      | 407.2                           | 04Aug2013, 13:15    | 49.8                      |
| ADD FS-7A                  | 1.75                                      | 1256.6                          | 04Aug2013, 14:45    | 570.5                     |
| RT FS-7A                   | 1.75                                      | 1255.5                          | 04Aug2013, 14:45    | 569.8                     |
| FS-7B                      | 0.15                                      | 140.6                           | 04Aug2013, 14:35    | 43.3                      |
| ADD FS-7B                  | 1.90                                      | 1395                            | 04Aug2013, 14:45    | 613.1                     |
| E Fire Tower Road (Bridge) | 1.90                                      | 1395                            | 04Aug2013, 14:45    | 613.1                     |
| RT FS-7B                   | 1.90                                      | 1386.8                          | 04Aug2013, 14:50    | 611.2                     |
| FS-8E                      | 0.12                                      | 190.6                           | 04Aug2013, 13:40    | 32.5                      |
| ADD FS8-E                  | 2.03                                      | 1440                            | 04Aug2013, 14:45    | 643.7                     |
| RT FS-8E                   | 2.03                                      | 1438.9                          | 04Aug2013, 14:45    | 643.1                     |
| FS-8B                      | 0.13                                      | 103.8                           | 04Aug2013, 15:00    | 36.4                      |
| FS-8C                      | 0.09                                      | 184.9                           | 04Aug2013, 13:35    | 29.9                      |
| FS-8A                      | 0.06                                      | 39                              | 04Aug2013, 16:15    | 18.8                      |
| ADD FS-8A-8B-8C            | 0.28                                      | 230.4                           | 04Aug2013, 13:35    | 85.2                      |
| RT FS-8C                   | 0.28                                      | 228.2                           | 04Aug2013, 13:40    | 85                        |
| FS-8D                      | 0.07                                      | 164.3                           | 04Aug2013, 13:15    | 19.8                      |
| ADD FS-8D                  | 2.38                                      | 1628.7                          | 04Aug2013, 14:45    | 747.9                     |
| ADD FSUT3 to FS            | 5.01                                      | 1755.6                          | 04Aug2013, 20:55    | 1406.2                    |
| FS-9                       | 0.14                                      | 143.4                           | 04Aug2013, 14:05    | 34                        |
| ADD FS-9                   | 5.15                                      | 1765.4                          | 04Aug2013, 20:55    | 1440.2                    |
| RT FS-9                    | 5.15                                      | 1763.7                          | 04Aug2013, 20:55    | 1435.9                    |
| FSUT2-3                    | 0.21                                      | 92.9                            | 04Aug2013, 17:25    | 52.7                      |
| FSUT2-1                    | 0.14                                      | 182                             | 04Aug2013, 14:00    | 41                        |
| U/S Limit FSUT2-2          | 0.14                                      | 182                             | 04Aug2013, 14:00    | 41                        |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR EXISTING</b>   |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 176                             | 04Aug2013, 14:05    | 40.8                      |
| FSUT2-2                   | 0.03                                      | 75.4                            | 04Aug2013, 13:15    | 9.1                       |
| ADD FSUT2-2               | 0.17                                      | 192.3                           | 04Aug2013, 14:00    | 49.9                      |
| RT FSUT2-2                | 0.17                                      | 191.4                           | 04Aug2013, 14:05    | 49.9                      |
| ADD FSUT2-3               | 0.38                                      | 212.1                           | 04Aug2013, 14:10    | 102.5                     |
| RT FSUT2-3                | 0.38                                      | 211.7                           | 04Aug2013, 14:10    | 102.4                     |
| FSUT2-4                   | 0.14                                      | 101                             | 04Aug2013, 15:45    | 44                        |
| ADD FSUT2-4               | 0.52                                      | 268.4                           | 04Aug2013, 14:20    | 146.4                     |
| RT FSUT2-4                | 0.52                                      | 267.2                           | 04Aug2013, 14:25    | 145.9                     |
| FSUT2-5                   | 0.21                                      | 120.7                           | 04Aug2013, 16:50    | 64.1                      |
| West Fire Tower Rd        | 0.73                                      | 343.2                           | 04Aug2013, 16:25    | 209.7                     |
| D/S Limit FSUT2-2         | 0.73                                      | 343.2                           | 04Aug2013, 16:25    | 209.7                     |
| FSUT2-6                   | 0.31                                      | 166.7                           | 04Aug2013, 17:20    | 95.7                      |
| ADD FSUT2-6               | 1.05                                      | 502.7                           | 04Aug2013, 16:45    | 305.3                     |
| RT FSUT2-6                | 1.05                                      | 502.2                           | 04Aug2013, 16:50    | 303.6                     |
| FSUT2-7A                  | 0.19                                      | 101.7                           | 04Aug2013, 16:50    | 53.7                      |
| ADD FSUT2-7A              | 1.24                                      | 603.9                           | 04Aug2013, 16:50    | 357.4                     |
| RT FSUT2-7A               | 1.24                                      | 603.2                           | 04Aug2013, 16:55    | 355.9                     |
| FSUT2-7B                  | 0.42                                      | 168.8                           | 04Aug2013, 18:30    | 106.2                     |
| ADD FSUT2-7B              | 1.66                                      | 752.3                           | 04Aug2013, 17:15    | 462.1                     |
| FSUT2-8A                  | 0.27                                      | 191.7                           | 04Aug2013, 15:40    | 82.6                      |
| FSUT2-8B                  | 0.06                                      | 157.6                           | 04Aug2013, 13:15    | 19.3                      |
| U/S Limit FSUT2-1         | 1.99                                      | 908.5                           | 04Aug2013, 16:45    | 564                       |
| RT FSUT2-8A-8B            | 1.99                                      | 908                             | 04Aug2013, 16:50    | 562.2                     |
| FSUT2-9B                  | 0.11                                      | 125.2                           | 04Aug2013, 14:20    | 34.3                      |
| FSUT2-9A                  | 0.10                                      | 251.2                           | 04Aug2013, 13:15    | 30.4                      |
| ADD FSUT2-9A-9B           | 2.20                                      | 957.5                           | 04Aug2013, 16:40    | 626.9                     |
| RT FSUT2-9A-9B            | 2.20                                      | 957.5                           | 04Aug2013, 18:10    | 599.4                     |
| ADD FSUT2                 | 7.35                                      | 2486                            | 04Aug2013, 19:20    | 2035.3                    |
| FSUT1-2A                  | 0.45                                      | 125.8                           | 04Aug2013, 20:25    | 83.8                      |
| FSUT1-2B                  | 0.24                                      | 123.2                           | 04Aug2013, 16:55    | 66                        |
| ADD FSUT1-2A-2B           | 0.69                                      | 210.7                           | 04Aug2013, 18:10    | 149.8                     |
| FSUT1-2D                  | 0.18                                      | 172.6                           | 04Aug2013, 14:35    | 53.2                      |
| FSUT1-2C                  | 0.11                                      | 231.6                           | 04Aug2013, 13:25    | 30.9                      |
| RT FSUT1-2C               | 0.11                                      | 180.4                           | 04Aug2013, 13:35    | 30.5                      |
| ADD FSUT1-2D              | 0.98                                      | 308                             | 04Aug2013, 14:00    | 233.5                     |
| RT-FSUT1-2D               | 0.98                                      | 303.8                           | 04Aug2013, 14:35    | 230.6                     |
| FSUT1-2E                  | 0.17                                      | 438.5                           | 04Aug2013, 13:15    | 53.1                      |
| ADD FSUT1-2E              | 1.15                                      | 572.3                           | 04Aug2013, 13:20    | 283.7                     |
| RT FSUT1-2E               | 1.15                                      | 534.2                           | 04Aug2013, 13:25    | 282.6                     |
| FSUT1-2F                  | 0.11                                      | 89.4                            | 04Aug2013, 14:50    | 29.4                      |
| ADD FSUT1-2F              | 1.26                                      | 560.4                           | 04Aug2013, 13:25    | 312.1                     |
| RT FSUT1-2F               | 1.26                                      | 545.8                           | 04Aug2013, 13:25    | 311.6                     |
| FSUT1-1A                  | 0.40                                      | 137.6                           | 04Aug2013, 19:40    | 91.3                      |
| FSUT1-1B                  | 0.39                                      | 180.8                           | 04Aug2013, 18:05    | 111.4                     |
| RT FSUT1-1A-1B            | 0.80                                      | 308.7                           | 04Aug2013, 18:55    | 198.5                     |
| FSUT1-1C                  | 0.27                                      | 167                             | 04Aug2013, 15:45    | 71.7                      |
| U/S Limit FSUT1           | 1.07                                      | 386.5                           | 04Aug2013, 18:05    | 270.2                     |
| FSUT1-2G                  | 0.09                                      | 155.1                           | 04Aug2013, 13:50    | 31.6                      |
| Trafalgar Drive           | 1.16                                      | 398.5                           | 04Aug2013, 18:10    | 298.2                     |
| Corey Road - FSUT1        | 2.41                                      | 719.2                           | 04Aug2013, 17:05    | 608.5                     |
| FSUT1-3                   | 0.19                                      | 138.9                           | 04Aug2013, 14:40    | 42.9                      |
| ADD FSUT1-3               | 2.60                                      | 839.2                           | 04Aug2013, 14:55    | 651.4                     |
| RT FSUT1                  | 2.60                                      | 839.2                           | 04Aug2013, 21:15    | 401.7                     |
| FS-10C                    | 0.10                                      | 87.9                            | 04Aug2013, 14:45    | 28.5                      |
| ADD FSUT1                 | 10.05                                     | 3287.7                          | 04Aug2013, 20:50    | 2465.5                    |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR EXISTING</b>   |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FS-10                  | 10.05                                     | 3282.6                          | 04Aug2013, 20:50    | 2454.8                    |
| FS-10D                    | 0.18                                      | 168.7                           | 04Aug2013, 14:50    | 56.1                      |
| FS-10B                    | 0.15                                      | 175.1                           | 04Aug2013, 14:05    | 41.3                      |
| FS-10A                    | 0.03                                      | 43.9                            | 04Aug2013, 14:10    | 11                        |
| RT FS-10A                 | 0.03                                      | 43.5                            | 04Aug2013, 14:30    | 10.9                      |
| ADD FS-10B-10C-10D        | 10.42                                     | 3315.1                          | 04Aug2013, 20:50    | 2563                      |
| RT FS-10B-10D             | 10.42                                     | 3311.6                          | 04Aug2013, 20:50    | 2555.9                    |
| FS-10F                    | 0.15                                      | 204.6                           | 04Aug2013, 13:40    | 35.9                      |
| FS-10E                    | 0.07                                      | 117.7                           | 04Aug2013, 13:35    | 18.7                      |
| ADD FS-10E-10F            | 10.64                                     | 3326.1                          | 04Aug2013, 20:50    | 2610.4                    |
| RT FS-10E-10F             | 10.64                                     | 3314.9                          | 04Aug2013, 20:55    | 2593.7                    |
| OUTLET                    | 10.64                                     | 3314.9                          | 04Aug2013, 20:55    | 2593.7                    |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR EXISTING</b>     |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 116                             | 04Aug2013, 15:05    | 44.2                      |
| FSUT3-1B                     | 0.10                                      | 169.8                           | 04Aug2013, 13:55    | 36.4                      |
| FSUT3-1C                     | 0.09                                      | 99.6                            | 04Aug2013, 14:35    | 30.7                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 323.3                           | 04Aug2013, 14:10    | 111.3                     |
| FSUT3-1D                     | 0.17                                      | 148.5                           | 04Aug2013, 15:40    | 64.6                      |
| RT FSUT3-1D                  | 0.17                                      | 148.5                           | 04Aug2013, 15:40    | 64.6                      |
| FSUT3-1E                     | 0.04                                      | 95.5                            | 04Aug2013, 13:25    | 12.8                      |
| U/S Limit FSUT3              | 0.49                                      | 433.9                           | 04Aug2013, 14:30    | 188.7                     |
| RT FSUT3-1E                  | 0.49                                      | 432.7                           | 04Aug2013, 14:40    | 188.1                     |
| FSUT3-2A                     | 0.08                                      | 62.9                            | 04Aug2013, 15:15    | 23.4                      |
| ADD FSUT3-2A                 | 0.58                                      | 490.8                           | 04Aug2013, 14:50    | 211.5                     |
| RT FSUT3-2A                  | 0.58                                      | 490.3                           | 04Aug2013, 14:50    | 211.2                     |
| FSUT3-2B                     | 0.11                                      | 96.3                            | 04Aug2013, 15:10    | 35.7                      |
| ADD FSUT3-2B                 | 0.69                                      | 584.4                           | 04Aug2013, 14:55    | 246.9                     |
| RT FSUT3-2B                  | 0.69                                      | 581.5                           | 04Aug2013, 15:05    | 246                       |
| FSUT3-3                      | 0.09                                      | 283.5                           | 04Aug2013, 13:15    | 34.5                      |
| ADD FSUT3-3                  | 0.78                                      | 611.7                           | 04Aug2013, 15:00    | 280.5                     |
| Coleman Drive                | 0.78                                      | 611.7                           | 04Aug2013, 15:00    | 280.5                     |
| FSUT3-5                      | 0.16                                      | 212.1                           | 04Aug2013, 14:35    | 67.1                      |
| Country Home Road            | 0.16                                      | 210.6                           | 04Aug2013, 14:40    | 67.1                      |
| RT FSUT3-5                   | 0.16                                      | 210.6                           | 04Aug2013, 14:40    | 67.1                      |
| FSUT3-6                      | 0.11                                      | 124.6                           | 04Aug2013, 14:35    | 38.4                      |
| ADD FSUT3-6                  | 0.27                                      | 335.1                           | 04Aug2013, 14:40    | 105.5                     |
| East Fire Tower Road - North | 0.27                                      | 294.7                           | 04Aug2013, 15:10    | 105.5                     |
| FSUT3-4C                     | 0.13                                      | 95.9                            | 04Aug2013, 16:15    | 46.4                      |
| FSUT3-4B                     | 0.07                                      | 133.8                           | 04Aug2013, 13:55    | 29.6                      |
| FSUT3-4A                     | 0.07                                      | 51.4                            | 04Aug2013, 16:15    | 25                        |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 183.2                           | 04Aug2013, 14:00    | 101                       |
| RT FSUT3-4C                  | 0.27                                      | 182.5                           | 04Aug2013, 14:10    | 100.6                     |
| FSUT3-4D                     | 0.08                                      | 288.7                           | 04Aug2013, 13:15    | 36                        |
| ADD FSUT3-4D                 | 0.62                                      | 486.7                           | 04Aug2013, 15:10    | 242.1                     |
| Wimbledon Drive              | 0.62                                      | 486.2                           | 04Aug2013, 15:15    | 241.8                     |
| FSUT3-7                      | 0.14                                      | 110.5                           | 04Aug2013, 16:15    | 53.8                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 583.3                           | 04Aug2013, 15:30    | 295.5                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 1184.3                          | 04Aug2013, 15:15    | 576                       |
| FSUT3-8                      | 0.08                                      | 153.8                           | 04Aug2013, 13:45    | 28.9                      |
| East Fire Tower - South      | 1.62                                      | 1220                            | 04Aug2013, 15:15    | 604.7                     |
| FSUT3-9B                     | 0.16                                      | 95.5                            | 04Aug2013, 17:20    | 54.5                      |
| FSUT3-9A                     | 0.05                                      | 89.5                            | 04Aug2013, 14:05    | 21.8                      |
| RT FSUT3-9A                  | 0.05                                      | 87.6                            | 04Aug2013, 14:15    | 21.6                      |
| ADD FSUT3-9B                 | 0.22                                      | 117.9                           | 04Aug2013, 14:25    | 76.1                      |
| Corey Road - FSUT3           | 0.22                                      | 117.9                           | 04Aug2013, 14:25    | 76.1                      |
| FSUT3-9C                     | 0.16                                      | 138.9                           | 04Aug2013, 15:40    | 60.2                      |
| ADD FSUT3-9C                 | 1.99                                      | 1458.8                          | 04Aug2013, 15:15    | 741                       |
| RT FSUT 3-9C                 | 1.99                                      | 1456.4                          | 04Aug2013, 15:20    | 739.8                     |
| FSUT3-9D                     | 0.09                                      | 293.4                           | 04Aug2013, 13:15    | 36.2                      |
| ADD FSUT3-9D                 | 2.08                                      | 1483                            | 04Aug2013, 15:15    | 776                       |
| RT FSUT3-9D                  | 2.08                                      | 1480.4                          | 04Aug2013, 15:20    | 773.7                     |
| FSUT3-10A                    | 0.24                                      | 156.9                           | 04Aug2013, 16:50    | 83.1                      |
| ADD FSUT3-10A                | 2.32                                      | 1603.9                          | 04Aug2013, 15:30    | 856.8                     |
| RT FSUT3-10A                 | 2.32                                      | 1602                            | 04Aug2013, 15:35    | 855.1                     |
| FSUT3-10C                    | 0.22                                      | 160.7                           | 04Aug2013, 15:45    | 69                        |
| FSUT3-10B                    | 0.09                                      | 299.5                           | 04Aug2013, 13:15    | 37.3                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 1786.8                          | 04Aug2013, 15:35    | 961.4                     |
| RT FSUT3                     | 2.63                                      | 1786.8                          | 04Aug2013, 21:05    | 807.6                     |
| FS-1B                        | 0.13                                      | 170.5                           | 04Aug2013, 14:35    | 53.8                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR EXISTING</b>   |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FS-1A                      | 0.12                                      | 165.7                           | 04Aug2013, 14:35    | 53.2                      |
| RT FS-1A                   | 0.12                                      | 165.5                           | 04Aug2013, 14:35    | 53.1                      |
| ADD FS-1B                  | 0.25                                      | 336                             | 04Aug2013, 14:35    | 106.9                     |
| RT FS-1B                   | 0.25                                      | 334.2                           | 04Aug2013, 14:40    | 106.7                     |
| FS-2A                      | 0.16                                      | 193.1                           | 04Aug2013, 14:35    | 60                        |
| RT FS-2A                   | 0.16                                      | 192.3                           | 04Aug2013, 14:40    | 59.9                      |
| FS-2B                      | 0.08                                      | 211.3                           | 04Aug2013, 13:25    | 32.4                      |
| ADD FS-2B                  | 0.23                                      | 282.7                           | 04Aug2013, 13:30    | 92.3                      |
| RT FS-2B                   | 0.23                                      | 279.4                           | 04Aug2013, 13:35    | 92.2                      |
| ADD FS1-2                  | 0.48                                      | 567                             | 04Aug2013, 14:35    | 198.8                     |
| FS-3                       | 0.08                                      | 139.5                           | 04Aug2013, 14:05    | 33.7                      |
| East Baywood Lane          | 0.56                                      | 680.5                           | 04Aug2013, 14:30    | 232.3                     |
| U/S Limit FS               | 0.56                                      | 680.5                           | 04Aug2013, 14:30    | 232.3                     |
| FS-4B                      | 0.12                                      | 206                             | 04Aug2013, 14:05    | 50.5                      |
| FS-4A                      | 0.10                                      | 90                              | 04Aug2013, 15:40    | 39.2                      |
| RT FS-4A                   | 0.10                                      | 89.8                            | 04Aug2013, 15:45    | 39.2                      |
| ADD FS-4B                  | 0.22                                      | 248                             | 04Aug2013, 14:10    | 89.7                      |
| RT FS-4B                   | 0.22                                      | 239.9                           | 04Aug2013, 14:15    | 89.3                      |
| Railroad                   | 0.78                                      | 915.6                           | 04Aug2013, 14:25    | 321.5                     |
| FS-5                       | 0.05                                      | 160.5                           | 04Aug2013, 13:15    | 19.5                      |
| Evans Street               | 0.83                                      | 937.4                           | 04Aug2013, 14:30    | 340.6                     |
| FS-6A                      | 0.16                                      | 151.9                           | 04Aug2013, 15:40    | 66.6                      |
| FS-6B                      | 0.09                                      | 248.9                           | 04Aug2013, 13:25    | 33.8                      |
| RT FS-6A-6B                | 0.25                                      | 282                             | 04Aug2013, 13:30    | 100.2                     |
| FS-6E                      | 0.11                                      | 86.5                            | 04Aug2013, 15:40    | 37.3                      |
| FS-6D                      | 0.10                                      | 100.7                           | 04Aug2013, 15:10    | 37.8                      |
| ADD FS-6D-6E               | 0.20                                      | 183.6                           | 04Aug2013, 15:20    | 75                        |
| FS-6C                      | 0.15                                      | 186.9                           | 04Aug2013, 14:35    | 58.1                      |
| ADD FS-6C                  | 1.44                                      | 1425                            | 04Aug2013, 14:35    | 573.9                     |
| FS-6F                      | 0.17                                      | 101.3                           | 04Aug2013, 17:20    | 58.1                      |
| ADD FS-6F                  | 1.60                                      | 1467.1                          | 04Aug2013, 14:40    | 631.9                     |
| RT FS-6F                   | 1.60                                      | 1453.8                          | 04Aug2013, 14:45    | 629.8                     |
| FS-7A                      | 0.15                                      | 488.6                           | 04Aug2013, 13:15    | 60.1                      |
| ADD FS-7A                  | 1.75                                      | 1511                            | 04Aug2013, 14:40    | 690                       |
| RT FS-7A                   | 1.75                                      | 1509.8                          | 04Aug2013, 14:45    | 689.2                     |
| FS-7B                      | 0.15                                      | 172.8                           | 04Aug2013, 14:35    | 53.3                      |
| ADD FS-7B                  | 1.90                                      | 1680.9                          | 04Aug2013, 14:45    | 742.5                     |
| E Fire Tower Road (Bridge) | 1.90                                      | 1680.9                          | 04Aug2013, 14:45    | 742.5                     |
| RT FS-7B                   | 1.90                                      | 1671.5                          | 04Aug2013, 14:45    | 740.3                     |
| FS-8E                      | 0.12                                      | 236.7                           | 04Aug2013, 13:40    | 40.5                      |
| ADD FS8-E                  | 2.03                                      | 1737.9                          | 04Aug2013, 14:45    | 780.8                     |
| RT FS-8E                   | 2.03                                      | 1737.3                          | 04Aug2013, 14:45    | 780.1                     |
| FS-8B                      | 0.13                                      | 127.2                           | 04Aug2013, 15:00    | 44.7                      |
| FS-8C                      | 0.09                                      | 223.5                           | 04Aug2013, 13:35    | 36.4                      |
| FS-8A                      | 0.06                                      | 47.6                            | 04Aug2013, 16:15    | 23                        |
| ADD FS-8A-8B-8C            | 0.28                                      | 281.6                           | 04Aug2013, 13:35    | 104.2                     |
| RT FS-8C                   | 0.28                                      | 279.2                           | 04Aug2013, 13:40    | 104                       |
| FS-8D                      | 0.07                                      | 202.3                           | 04Aug2013, 13:15    | 24.5                      |
| ADD FS-8D                  | 2.38                                      | 1968.7                          | 04Aug2013, 14:45    | 908.5                     |
| ADD FSUT3 to FS            | 5.01                                      | 2122.3                          | 04Aug2013, 20:55    | 1716.2                    |
| FS-9                       | 0.14                                      | 180.7                           | 04Aug2013, 14:05    | 42.8                      |
| ADD FS-9                   | 5.15                                      | 2146.5                          | 04Aug2013, 14:35    | 1758.9                    |
| RT FS-9                    | 5.15                                      | 2144.9                          | 04Aug2013, 14:35    | 1754                      |
| FSUT2-3                    | 0.21                                      | 115.5                           | 04Aug2013, 17:25    | 65.6                      |
| FSUT2-1                    | 0.14                                      | 221.8                           | 04Aug2013, 14:00    | 50.2                      |
| U/S Limit FSUT2-2          | 0.14                                      | 221.8                           | 04Aug2013, 14:00    | 50.2                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR EXISTING</b>  |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 214.8                           | 04Aug2013, 14:05    | 50                        |
| FSUT2-2                   | 0.03                                      | 92.6                            | 04Aug2013, 13:15    | 11.2                      |
| ADD FSUT2-2               | 0.17                                      | 234.9                           | 04Aug2013, 14:00    | 61.2                      |
| RT FSUT2-2                | 0.17                                      | 233.8                           | 04Aug2013, 14:05    | 61.1                      |
| ADD FSUT2-3               | 0.38                                      | 260.5                           | 04Aug2013, 14:05    | 126.7                     |
| RT FSUT2-3                | 0.38                                      | 260.4                           | 04Aug2013, 14:10    | 126.6                     |
| FSUT2-4                   | 0.14                                      | 121.9                           | 04Aug2013, 15:40    | 53.3                      |
| ADD FSUT2-4               | 0.52                                      | 328.9                           | 04Aug2013, 14:20    | 179.9                     |
| RT FSUT2-4                | 0.52                                      | 327.6                           | 04Aug2013, 14:25    | 179.4                     |
| FSUT2-5                   | 0.21                                      | 146.3                           | 04Aug2013, 16:45    | 78                        |
| West Fire Tower Rd        | 0.73                                      | 419.4                           | 04Aug2013, 16:15    | 256.9                     |
| D/S Limit FSUT2-2         | 0.73                                      | 419.4                           | 04Aug2013, 16:15    | 256.9                     |
| FSUT2-6                   | 0.31                                      | 200.9                           | 04Aug2013, 17:20    | 115.9                     |
| ADD FSUT2-6               | 1.05                                      | 609.3                           | 04Aug2013, 16:40    | 372.8                     |
| RT FSUT2-6                | 1.05                                      | 608.7                           | 04Aug2013, 16:45    | 370.9                     |
| FSUT2-7A                  | 0.19                                      | 124.8                           | 04Aug2013, 16:50    | 66.1                      |
| ADD FSUT2-7A              | 1.24                                      | 733.4                           | 04Aug2013, 16:45    | 437                       |
| RT FSUT2-7A               | 1.24                                      | 732.5                           | 04Aug2013, 16:50    | 435.3                     |
| FSUT2-7B                  | 0.42                                      | 207.1                           | 04Aug2013, 18:30    | 131                       |
| ADD FSUT2-7B              | 1.66                                      | 913.9                           | 04Aug2013, 17:10    | 566.3                     |
| FSUT2-8A                  | 0.27                                      | 232.8                           | 04Aug2013, 15:40    | 100.7                     |
| FSUT2-8B                  | 0.06                                      | 189.1                           | 04Aug2013, 13:15    | 23.3                      |
| U/S Limit FSUT2-1         | 1.99                                      | 1107.6                          | 04Aug2013, 16:40    | 690.2                     |
| RT FSUT2-8A-8B            | 1.99                                      | 1107.1                          | 04Aug2013, 16:45    | 688.2                     |
| FSUT2-9B                  | 0.11                                      | 152.2                           | 04Aug2013, 14:20    | 41.9                      |
| FSUT2-9A                  | 0.10                                      | 305.1                           | 04Aug2013, 13:15    | 37.1                      |
| ADD FSUT2-9A-9B           | 2.20                                      | 1167.8                          | 04Aug2013, 16:35    | 767.1                     |
| RT FSUT2-9A-9B            | 2.20                                      | 1167.8                          | 04Aug2013, 18:05    | 734.3                     |
| ADD FSUT2                 | 7.35                                      | 3052.1                          | 04Aug2013, 19:15    | 2488.3                    |
| FSUT1-2A                  | 0.45                                      | 157.5                           | 04Aug2013, 20:25    | 105.5                     |
| FSUT1-2B                  | 0.24                                      | 151.2                           | 04Aug2013, 16:55    | 81.2                      |
| ADD FSUT1-2A-2B           | 0.69                                      | 261.8                           | 04Aug2013, 18:10    | 186.7                     |
| FSUT1-2D                  | 0.18                                      | 210.8                           | 04Aug2013, 14:35    | 65.1                      |
| FSUT1-2C                  | 0.11                                      | 285.2                           | 04Aug2013, 13:25    | 38.3                      |
| RT FSUT1-2C               | 0.11                                      | 224.7                           | 04Aug2013, 13:35    | 37.8                      |
| ADD FSUT1-2D              | 0.98                                      | 379.7                           | 04Aug2013, 13:55    | 289.6                     |
| RT-FSUT1-2D               | 0.98                                      | 373.9                           | 04Aug2013, 14:35    | 286.3                     |
| FSUT1-2E                  | 0.17                                      | 532.6                           | 04Aug2013, 13:15    | 64.8                      |
| ADD FSUT1-2E              | 1.15                                      | 714.8                           | 04Aug2013, 13:20    | 351.1                     |
| RT FSUT1-2E               | 1.15                                      | 667.3                           | 04Aug2013, 13:25    | 349.9                     |
| FSUT1-2F                  | 0.11                                      | 110.2                           | 04Aug2013, 14:50    | 36.4                      |
| ADD FSUT1-2F              | 1.26                                      | 701.2                           | 04Aug2013, 13:25    | 386.2                     |
| RT FSUT1-2F               | 1.26                                      | 684.6                           | 04Aug2013, 13:25    | 385.6                     |
| FSUT1-1A                  | 0.40                                      | 169.5                           | 04Aug2013, 19:35    | 113                       |
| FSUT1-1B                  | 0.39                                      | 219.2                           | 04Aug2013, 18:05    | 135.7                     |
| RT FSUT1-1A-1B            | 0.80                                      | 377.2                           | 04Aug2013, 18:50    | 244                       |
| FSUT1-1C                  | 0.27                                      | 206.8                           | 04Aug2013, 15:45    | 88.9                      |
| U/S Limit FSUT1           | 1.07                                      | 473.7                           | 04Aug2013, 18:00    | 332.9                     |
| FSUT1-2G                  | 0.09                                      | 185                             | 04Aug2013, 13:50    | 38                        |
| Trafalgar Drive           | 1.16                                      | 489.5                           | 04Aug2013, 17:50    | 366.1                     |
| Corey Road - FSUT1        | 2.41                                      | 897.4                           | 04Aug2013, 16:45    | 750.1                     |
| FSUT1-3                   | 0.19                                      | 176.5                           | 04Aug2013, 14:40    | 54.3                      |
| ADD FSUT1-3               | 2.60                                      | 1043.2                          | 04Aug2013, 14:45    | 804.5                     |
| RT FSUT1                  | 2.60                                      | 1043.2                          | 04Aug2013, 21:05    | 502.7                     |
| FS-10C                    | 0.10                                      | 108.5                           | 04Aug2013, 14:45    | 35.2                      |
| ADD FSUT1                 | 10.05                                     | 4024.5                          | 04Aug2013, 20:40    | 3026.3                    |



City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 100-YEAR EXISTING  |                                     |                         |                  |                   |
|--------------------|-------------------------------------|-------------------------|------------------|-------------------|
| Hydrologic Element | Drainage Area<br>(mi <sup>2</sup> ) | Peak Discharge<br>(CFS) | Time of Peak     | Volume<br>(AC-FT) |
| RT FS-10           | 10.05                               | 4015.9                  | 04Aug2013, 20:45 | 3014              |
| FS-10D             | 0.18                                | 204.6                   | 04Aug2013, 14:45 | 68.3              |
| FS-10B             | 0.15                                | 217.2                   | 04Aug2013, 14:05 | 51.3              |
| FS-10A             | 0.03                                | 52.9                    | 04Aug2013, 14:10 | 13.3              |
| RT FS-10A          | 0.03                                | 52.4                    | 04Aug2013, 14:25 | 13.2              |
| ADD FS-10B-10C-10D | 10.42                               | 4055.4                  | 04Aug2013, 20:40 | 3146.7            |
| RT FS-10B-10D      | 10.42                               | 4050.5                  | 04Aug2013, 20:45 | 3138.5            |
| FS-10F             | 0.15                                | 259.6                   | 04Aug2013, 13:40 | 45.4              |
| FS-10E             | 0.07                                | 144.5                   | 04Aug2013, 13:35 | 23                |
| ADD FS-10E-10F     | 10.64                               | 4068                    | 04Aug2013, 20:45 | 3206.9            |
| RT FS-10E-10F      | 10.64                               | 4051.5                  | 04Aug2013, 20:45 | 3187.5            |
| OUTLET             | 10.64                               | 4051.5                  | 04Aug2013, 20:45 | 3187.5            |

**PRIMARY SYSTEM  
FUTURE CONDITIONS:  
HEC-HMS OUTPUT**

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR FUTURE</b>         |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 34                              | 04Aug2013, 15:10    | 12.6                      |
| FSUT3-1B                     | 0.10                                      | 41.5                            | 04Aug2013, 13:55    | 8.9                       |
| FSUT3-1C                     | 0.09                                      | 19.8                            | 04Aug2013, 14:45    | 6.4                       |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 77.7                            | 04Aug2013, 14:20    | 27.9                      |
| FSUT3-1D                     | 0.17                                      | 42.3                            | 04Aug2013, 15:45    | 18.2                      |
| RT FSUT3-1D                  | 0.17                                      | 42.3                            | 04Aug2013, 15:45    | 18.2                      |
| FSUT3-1E                     | 0.04                                      | 19.9                            | 04Aug2013, 13:25    | 2.7                       |
| U/S Limit FSUT3              | 0.49                                      | 111.6                           | 04Aug2013, 14:55    | 48.8                      |
| RT FSUT3-1E                  | 0.49                                      | 111.2                           | 04Aug2013, 15:05    | 48.5                      |
| FSUT3-2A                     | 0.08                                      | 14.1                            | 04Aug2013, 15:20    | 5.5                       |
| ADD FSUT3-2A                 | 0.58                                      | 125                             | 04Aug2013, 15:10    | 54                        |
| RT FSUT3-2A                  | 0.58                                      | 124.9                           | 04Aug2013, 15:10    | 53.9                      |
| FSUT3-2B                     | 0.11                                      | 19.9                            | 04Aug2013, 15:20    | 7.7                       |
| ADD FSUT3-2B                 | 0.69                                      | 144.7                           | 04Aug2013, 15:15    | 61.6                      |
| RT FSUT3-2B                  | 0.69                                      | 143.8                           | 04Aug2013, 15:20    | 61.2                      |
| FSUT3-3                      | 0.09                                      | 71.4                            | 04Aug2013, 13:20    | 8.6                       |
| ADD FSUT3-3                  | 0.78                                      | 151.9                           | 04Aug2013, 15:20    | 69.8                      |
| Coleman Drive                | 0.78                                      | 151.8                           | 04Aug2013, 15:20    | 69.8                      |
| FSUT3-5                      | 0.16                                      | 64.7                            | 04Aug2013, 14:35    | 19.9                      |
| Country Home Road            | 0.16                                      | 64.7                            | 04Aug2013, 14:40    | 19.9                      |
| RT FSUT3-5                   | 0.16                                      | 64.7                            | 04Aug2013, 14:40    | 19.9                      |
| FSUT3-6                      | 0.11                                      | 48.1                            | 04Aug2013, 14:35    | 14.8                      |
| ADD FSUT3-6                  | 0.27                                      | 112.8                           | 04Aug2013, 14:35    | 34.7                      |
| East Fire Tower Road - North | 0.27                                      | 110.6                           | 04Aug2013, 14:50    | 34.7                      |
| FSUT3-4C                     | 0.13                                      | 28.4                            | 04Aug2013, 16:20    | 13.7                      |
| FSUT3-4B                     | 0.07                                      | 42.3                            | 04Aug2013, 13:55    | 9                         |
| FSUT3-4A                     | 0.07                                      | 13.9                            | 04Aug2013, 16:20    | 6.7                       |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 53.5                            | 04Aug2013, 14:00    | 29.4                      |
| RT FSUT3-4C                  | 0.27                                      | 53.3                            | 04Aug2013, 14:10    | 29.2                      |
| FSUT3-4D                     | 0.08                                      | 83.9                            | 04Aug2013, 13:20    | 10.1                      |
| ADD FSUT3-4D                 | 0.62                                      | 169.1                           | 04Aug2013, 14:40    | 74                        |
| Wimbledon Drive              | 0.62                                      | 168.2                           | 04Aug2013, 14:50    | 73.9                      |
| FSUT3-7                      | 0.14                                      | 31.9                            | 04Aug2013, 16:20    | 15.4                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 190.4                           | 04Aug2013, 15:10    | 89.3                      |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 341.7                           | 04Aug2013, 15:15    | 159.1                     |
| FSUT3-8                      | 0.08                                      | 35.5                            | 04Aug2013, 13:45    | 6.7                       |
| East Fire Tower - South      | 1.62                                      | 351.4                           | 04Aug2013, 15:15    | 165.7                     |
| FSUT3-9B                     | 0.16                                      | 26.4                            | 04Aug2013, 17:30    | 15                        |
| FSUT3-9A                     | 0.05                                      | 25.2                            | 04Aug2013, 14:05    | 6                         |
| RT FSUT3-9A                  | 0.05                                      | 24.7                            | 04Aug2013, 14:25    | 5.9                       |
| ADD FSUT3-9B                 | 0.22                                      | 31.9                            | 04Aug2013, 14:35    | 20.9                      |
| Corey Road - FSUT3           | 0.22                                      | 31.9                            | 04Aug2013, 14:35    | 20.9                      |
| FSUT3-9C                     | 0.16                                      | 34.4                            | 04Aug2013, 15:50    | 14.9                      |
| ADD FSUT3-9C                 | 1.99                                      | 412.8                           | 04Aug2013, 15:20    | 201.5                     |
| RT FSUT 3-9C                 | 1.99                                      | 411.8                           | 04Aug2013, 15:20    | 201                       |
| FSUT3-9D                     | 0.09                                      | 84.2                            | 04Aug2013, 13:20    | 10.1                      |
| ADD FSUT3-9D                 | 2.08                                      | 420.6                           | 04Aug2013, 15:20    | 211.1                     |
| RT FSUT3-9D                  | 2.08                                      | 419.2                           | 04Aug2013, 15:25    | 210                       |
| FSUT3-10A                    | 0.24                                      | 39.7                            | 04Aug2013, 17:00    | 21.1                      |
| ADD FSUT3-10A                | 2.32                                      | 448.4                           | 04Aug2013, 15:35    | 231                       |
| RT FSUT3-10A                 | 2.32                                      | 447.7                           | 04Aug2013, 15:35    | 230.3                     |
| FSUT3-10C                    | 0.22                                      | 35.1                            | 04Aug2013, 15:55    | 15.6                      |
| FSUT3-10B                    | 0.09                                      | 87                              | 04Aug2013, 13:20    | 10.5                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 490.4                           | 04Aug2013, 15:40    | 256.4                     |
| RT FSUT3                     | 2.63                                      | 490.4                           | 04Aug2013, 21:10    | 207.5                     |
| FS-1B                        | 0.13                                      | 48.9                            | 04Aug2013, 14:40    | 15                        |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 2-YEAR FUTURE              |                                  |                      |                  |                |
|----------------------------|----------------------------------|----------------------|------------------|----------------|
| Hydrologic Element         | Drainage Area (mi <sup>2</sup> ) | Peak Discharge (CFS) | Time of Peak     | Volume (AC-FT) |
| FS-1A                      | 0.12                             | 52.6                 | 04Aug2013, 14:35 | 16.2           |
| RT FS-1A                   | 0.12                             | 52.5                 | 04Aug2013, 14:40 | 16.2           |
| ADD FS-1B                  | 0.25                             | 101.4                | 04Aug2013, 14:40 | 31.2           |
| RT FS-1B                   | 0.25                             | 100.8                | 04Aug2013, 14:45 | 31.1           |
| FS-2A                      | 0.16                             | 48.2                 | 04Aug2013, 14:40 | 14.9           |
| RT FS-2A                   | 0.16                             | 48                   | 04Aug2013, 14:45 | 14.9           |
| FS-2B                      | 0.08                             | 62                   | 04Aug2013, 13:30 | 9.1            |
| ADD FS-2B                  | 0.23                             | 74                   | 04Aug2013, 13:30 | 24             |
| RT FS-2B                   | 0.23                             | 73.1                 | 04Aug2013, 13:35 | 23.9           |
| ADD FS1-2                  | 0.48                             | 160.9                | 04Aug2013, 14:45 | 55.1           |
| FS-3                       | 0.08                             | 37.1                 | 04Aug2013, 14:05 | 8.8            |
| East Baywood Lane          | 0.56                             | 188                  | 04Aug2013, 14:40 | 63.8           |
| U/S Limit FS               | 0.56                             | 188                  | 04Aug2013, 14:40 | 63.8           |
| FS-4B                      | 0.12                             | 61.1                 | 04Aug2013, 14:05 | 14.5           |
| FS-4A                      | 0.10                             | 24.2                 | 04Aug2013, 15:45 | 10.4           |
| RT FS-4A                   | 0.10                             | 24.2                 | 04Aug2013, 15:55 | 10.4           |
| ADD FS-4B                  | 0.22                             | 70                   | 04Aug2013, 14:10 | 24.9           |
| RT FS-4B                   | 0.22                             | 67.6                 | 04Aug2013, 14:20 | 24.7           |
| Railroad                   | 0.78                             | 250.5                | 04Aug2013, 14:45 | 88.4           |
| FS-5                       | 0.05                             | 60.8                 | 04Aug2013, 13:15 | 7.4            |
| Evans Street               | 0.83                             | 257.6                | 04Aug2013, 14:45 | 95.7           |
| FS-6A                      | 0.16                             | 46.6                 | 04Aug2013, 15:45 | 20             |
| FS-6B                      | 0.09                             | 58.4                 | 04Aug2013, 13:25 | 7.9            |
| RT FS-6A-6B                | 0.25                             | 65.7                 | 04Aug2013, 13:35 | 27.8           |
| FS-6E                      | 0.11                             | 22.9                 | 04Aug2013, 15:50 | 9.9            |
| FS-6D                      | 0.10                             | 25                   | 04Aug2013, 15:15 | 9.4            |
| ADD FS-6D-6E               | 0.20                             | 47                   | 04Aug2013, 15:30 | 19.3           |
| FS-6C                      | 0.15                             | 53                   | 04Aug2013, 14:40 | 16.3           |
| ADD FS-6C                  | 1.44                             | 397                  | 04Aug2013, 14:50 | 159.1          |
| FS-6F                      | 0.17                             | 27.8                 | 04Aug2013, 17:30 | 15.7           |
| ADD FS-6F                  | 1.60                             | 408.4                | 04Aug2013, 14:55 | 174.9          |
| RT FS-6F                   | 1.60                             | 403.5                | 04Aug2013, 15:00 | 173.9          |
| FS-7A                      | 0.15                             | 131.6                | 04Aug2013, 13:20 | 15.8           |
| ADD FS-7A                  | 1.75                             | 419.6                | 04Aug2013, 15:00 | 189.7          |
| RT FS-7A                   | 1.75                             | 419                  | 04Aug2013, 15:05 | 189.3          |
| FS-7B                      | 0.15                             | 46.9                 | 04Aug2013, 14:40 | 14.5           |
| ADD FS-7B                  | 1.90                             | 463.6                | 04Aug2013, 15:00 | 203.9          |
| E Fire Tower Road (Bridge) | 1.90                             | 463.6                | 04Aug2013, 15:00 | 203.9          |
| RT FS-7B                   | 1.90                             | 460.3                | 04Aug2013, 15:05 | 203.1          |
| FS-8E                      | 0.12                             | 47                   | 04Aug2013, 13:40 | 8.4            |
| ADD FS8-E                  | 2.03                             | 473.1                | 04Aug2013, 15:05 | 211.5          |
| RT FS-8E                   | 2.03                             | 472.5                | 04Aug2013, 15:05 | 211.2          |
| FS-8B                      | 0.13                             | 27.9                 | 04Aug2013, 15:05 | 10.1           |
| FS-8C                      | 0.09                             | 60.3                 | 04Aug2013, 13:35 | 9.7            |
| FS-8A                      | 0.06                             | 11.1                 | 04Aug2013, 16:25 | 5.4            |
| ADD FS-8A-8B-8C            | 0.28                             | 68.6                 | 04Aug2013, 13:40 | 25.1           |
| RT FS-8C                   | 0.28                             | 68.4                 | 04Aug2013, 13:45 | 25             |
| FS-8D                      | 0.07                             | 43                   | 04Aug2013, 13:20 | 5.3            |
| ADD FS-8D                  | 2.38                             | 526.4                | 04Aug2013, 15:05 | 241.5          |
| ADD FSUT3 to FS            | 5.01                             | 598.7                | 04Aug2013, 21:00 | 449            |
| FS-9                       | 0.14                             | 40.1                 | 04Aug2013, 14:10 | 9.9            |
| ADD FS-9                   | 5.15                             | 602.1                | 04Aug2013, 21:00 | 458.9          |
| RT FS-9                    | 5.15                             | 601.3                | 04Aug2013, 21:05 | 456.9          |
| FSUT2-3                    | 0.21                             | 31.6                 | 04Aug2013, 17:35 | 18             |
| FSUT2-1                    | 0.14                             | 58.4                 | 04Aug2013, 14:00 | 13.2           |
| U/S Limit FSUT2-2          | 0.14                             | 58.4                 | 04Aug2013, 14:00 | 13.2           |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR FUTURE</b>      |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 56.2                            | 04Aug2013, 14:10    | 13.1                      |
| FSUT2-2                   | 0.03                                      | 25.6                            | 04Aug2013, 13:20    | 3.1                       |
| ADD FSUT2-2               | 0.17                                      | 61.5                            | 04Aug2013, 14:10    | 16.2                      |
| RT FSUT2-2                | 0.17                                      | 61.1                            | 04Aug2013, 14:10    | 16.2                      |
| ADD FSUT2-3               | 0.38                                      | 67.4                            | 04Aug2013, 14:15    | 34.2                      |
| RT FSUT2-3                | 0.38                                      | 67.2                            | 04Aug2013, 14:20    | 34.1                      |
| FSUT2-4                   | 0.14                                      | 41                              | 04Aug2013, 15:45    | 17.8                      |
| ADD FSUT2-4               | 0.52                                      | 92.8                            | 04Aug2013, 14:35    | 51.9                      |
| RT FSUT2-4                | 0.52                                      | 92.5                            | 04Aug2013, 14:40    | 51.6                      |
| FSUT2-5                   | 0.21                                      | 48.1                            | 04Aug2013, 16:50    | 25.4                      |
| West Fire Tower Rd        | 0.73                                      | 130.9                           | 04Aug2013, 16:20    | 76.9                      |
| D/S Limit FSUT2-2         | 0.73                                      | 130.9                           | 04Aug2013, 16:20    | 76.9                      |
| FSUT2-6                   | 0.31                                      | 64                              | 04Aug2013, 17:25    | 36.4                      |
| ADD FSUT2-6               | 1.05                                      | 191.2                           | 04Aug2013, 16:45    | 113.2                     |
| RT FSUT2-6                | 1.05                                      | 190.9                           | 04Aug2013, 16:55    | 112.4                     |
| FSUT2-7A                  | 0.19                                      | 31.6                            | 04Aug2013, 17:00    | 16.8                      |
| ADD FSUT2-7A              | 1.24                                      | 222.5                           | 04Aug2013, 16:55    | 129.1                     |
| RT FSUT2-7A               | 1.24                                      | 222.1                           | 04Aug2013, 17:00    | 128.3                     |
| FSUT2-7B                  | 0.42                                      | 50.2                            | 04Aug2013, 18:45    | 31.4                      |
| ADD FSUT2-7B              | 1.66                                      | 264.5                           | 04Aug2013, 17:15    | 159.7                     |
| FSUT2-8A                  | 0.27                                      | 58.6                            | 04Aug2013, 15:50    | 25.4                      |
| FSUT2-8B                  | 0.06                                      | 50.9                            | 04Aug2013, 13:20    | 6.1                       |
| U/S Limit FSUT2-1         | 1.99                                      | 313.9                           | 04Aug2013, 16:55    | 191.2                     |
| RT FSUT2-8A-8B            | 1.99                                      | 313.8                           | 04Aug2013, 17:00    | 190.3                     |
| FSUT2-9B                  | 0.11                                      | 37.5                            | 04Aug2013, 14:25    | 10.4                      |
| FSUT2-9A                  | 0.10                                      | 73.5                            | 04Aug2013, 13:20    | 8.9                       |
| ADD FSUT2-9A-9B           | 2.20                                      | 330.1                           | 04Aug2013, 16:50    | 209.5                     |
| RT FSUT2-9A-9B            | 2.20                                      | 330.1                           | 04Aug2013, 18:20    | 198.9                     |
| ADD FSUT2                 | 7.35                                      | 849.5                           | 04Aug2013, 20:40    | 655.8                     |
| FSUT1-2A                  | 0.45                                      | 39.4                            | 04Aug2013, 20:45    | 25.8                      |
| FSUT1-2B                  | 0.24                                      | 40                              | 04Aug2013, 17:05    | 21.5                      |
| ADD FSUT1-2A-2B           | 0.69                                      | 66.9                            | 04Aug2013, 18:20    | 47.3                      |
| FSUT1-2D                  | 0.18                                      | 52.7                            | 04Aug2013, 14:40    | 16.4                      |
| FSUT1-2C                  | 0.11                                      | 58.3                            | 04Aug2013, 13:25    | 8                         |
| RT FSUT1-2C               | 0.11                                      | 42.2                            | 04Aug2013, 13:50    | 7.8                       |
| ADD FSUT1-2D              | 0.98                                      | 91.7                            | 04Aug2013, 14:40    | 71.6                      |
| RT-FSUT1-2D               | 0.98                                      | 91.1                            | 04Aug2013, 15:00    | 70.3                      |
| FSUT1-2E                  | 0.17                                      | 140.1                           | 04Aug2013, 13:20    | 16.8                      |
| ADD FSUT1-2E              | 1.15                                      | 148.9                           | 04Aug2013, 13:20    | 87.1                      |
| RT FSUT1-2E               | 1.15                                      | 134.2                           | 04Aug2013, 13:25    | 86.6                      |
| FSUT1-2F                  | 0.11                                      | 30.4                            | 04Aug2013, 14:50    | 10.1                      |
| ADD FSUT1-2F              | 1.26                                      | 141.4                           | 04Aug2013, 13:25    | 96.7                      |
| RT FSUT1-2F               | 1.26                                      | 140.2                           | 04Aug2013, 14:50    | 96.5                      |
| FSUT1-1A                  | 0.40                                      | 43.8                            | 04Aug2013, 19:50    | 28.7                      |
| FSUT1-1B                  | 0.39                                      | 56.6                            | 04Aug2013, 18:15    | 34.4                      |
| RT FSUT1-1A-1B            | 0.80                                      | 97.4                            | 04Aug2013, 19:20    | 61.2                      |
| FSUT1-1C                  | 0.27                                      | 55.5                            | 04Aug2013, 15:50    | 24.1                      |
| U/S Limit FSUT1           | 1.07                                      | 122.5                           | 04Aug2013, 18:30    | 85.3                      |
| FSUT1-2G                  | 0.09                                      | 52.3                            | 04Aug2013, 13:50    | 10.4                      |
| Trafalgar Drive           | 1.16                                      | 126.7                           | 04Aug2013, 18:35    | 94.2                      |
| Corey Road - FSUT1        | 2.41                                      | 228.8                           | 04Aug2013, 17:30    | 190.3                     |
| FSUT1-3                   | 0.19                                      | 36.4                            | 04Aug2013, 14:45    | 12                        |
| ADD FSUT1-3               | 2.60                                      | 251.7                           | 04Aug2013, 15:10    | 202.3                     |
| RT FSUT1                  | 2.60                                      | 251.7                           | 04Aug2013, 21:30    | 117.5                     |
| FS-10C                    | 0.10                                      | 23.5                            | 04Aug2013, 14:50    | 7.9                       |
| ADD FSUT1                 | 10.05                                     | 1094                            | 04Aug2013, 20:55    | 781.2                     |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR FUTURE</b>      |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FS-10                  | 10.05                                     | 1091                            | 04Aug2013, 21:00    | 776.3                     |
| FS-10D                    | 0.18                                      | 49.5                            | 04Aug2013, 14:55    | 16.6                      |
| FS-10B                    | 0.15                                      | 41.8                            | 04Aug2013, 14:10    | 10.4                      |
| FS-10A                    | 0.03                                      | 13.7                            | 04Aug2013, 14:10    | 3.4                       |
| RT FS-10A                 | 0.03                                      | 13.5                            | 04Aug2013, 14:40    | 3.4                       |
| ADD FS-10B-10C-10D        | 10.42                                     | 1102.3                          | 04Aug2013, 20:55    | 806.7                     |
| RT FS-10B-10D             | 10.42                                     | 1100.7                          | 04Aug2013, 21:00    | 803.5                     |
| FS-10F                    | 0.15                                      | 54.1                            | 04Aug2013, 13:45    | 10                        |
| FS-10E                    | 0.07                                      | 33.7                            | 04Aug2013, 13:35    | 5.4                       |
| ADD FS-10E-10F            | 10.64                                     | 1105.7                          | 04Aug2013, 21:00    | 818.9                     |
| RT FS-10E-10F             | 10.64                                     | 1100.3                          | 04Aug2013, 21:05    | 811.4                     |
| OUTLET                    | 10.64                                     | 1100.3                          | 04Aug2013, 21:05    | 811.4                     |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR FUTURE</b>        |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 61.4                            | 04Aug2013, 15:10    | 23                        |
| FSUT3-1B                     | 0.10                                      | 83.4                            | 04Aug2013, 13:55    | 17.6                      |
| FSUT3-1C                     | 0.09                                      | 44.7                            | 04Aug2013, 14:40    | 13.8                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 157                             | 04Aug2013, 14:15    | 54.4                      |
| FSUT3-1D                     | 0.17                                      | 78.9                            | 04Aug2013, 15:40    | 34                        |
| RT FSUT3-1D                  | 0.17                                      | 78.9                            | 04Aug2013, 15:40    | 34                        |
| FSUT3-1E                     | 0.04                                      | 44.4                            | 04Aug2013, 13:25    | 5.9                       |
| U/S Limit FSUT3              | 0.49                                      | 217.3                           | 04Aug2013, 14:45    | 94.3                      |
| RT FSUT3-1E                  | 0.49                                      | 216.7                           | 04Aug2013, 14:50    | 94                        |
| FSUT3-2A                     | 0.08                                      | 32.6                            | 04Aug2013, 15:15    | 12.2                      |
| ADD FSUT3-2A                 | 0.58                                      | 247.9                           | 04Aug2013, 14:55    | 106.2                     |
| RT FSUT3-2A                  | 0.58                                      | 247.7                           | 04Aug2013, 15:00    | 106                       |
| FSUT3-2B                     | 0.11                                      | 44.9                            | 04Aug2013, 15:15    | 16.8                      |
| ADD FSUT3-2B                 | 0.69                                      | 292.1                           | 04Aug2013, 15:05    | 122.8                     |
| RT FSUT3-2B                  | 0.69                                      | 290.4                           | 04Aug2013, 15:10    | 122.1                     |
| FSUT3-3                      | 0.09                                      | 141.5                           | 04Aug2013, 13:20    | 17                        |
| ADD FSUT3-3                  | 0.78                                      | 305.7                           | 04Aug2013, 15:10    | 139.1                     |
| Coleman Drive                | 0.78                                      | 305.7                           | 04Aug2013, 15:10    | 139.1                     |
| FSUT3-5                      | 0.16                                      | 115.2                           | 04Aug2013, 14:35    | 35.8                      |
| Country Home Road            | 0.16                                      | 115.1                           | 04Aug2013, 14:35    | 35.8                      |
| RT FSUT3-5                   | 0.16                                      | 115.1                           | 04Aug2013, 14:35    | 35.8                      |
| FSUT3-6                      | 0.11                                      | 83.2                            | 04Aug2013, 14:35    | 26                        |
| ADD FSUT3-6                  | 0.27                                      | 198.4                           | 04Aug2013, 14:35    | 61.8                      |
| East Fire Tower Road - North | 0.27                                      | 177.1                           | 04Aug2013, 15:05    | 61.8                      |
| FSUT3-4C                     | 0.13                                      | 53.8                            | 04Aug2013, 16:15    | 26                        |
| FSUT3-4B                     | 0.07                                      | 73.7                            | 04Aug2013, 13:55    | 15.9                      |
| FSUT3-4A                     | 0.07                                      | 26.7                            | 04Aug2013, 16:15    | 12.9                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 99.1                            | 04Aug2013, 14:00    | 54.7                      |
| RT FSUT3-4C                  | 0.27                                      | 98.8                            | 04Aug2013, 14:10    | 54.5                      |
| FSUT3-4D                     | 0.08                                      | 152.6                           | 04Aug2013, 13:15    | 18.5                      |
| ADD FSUT3-4D                 | 0.62                                      | 284                             | 04Aug2013, 14:15    | 134.9                     |
| Wimbledon Drive              | 0.62                                      | 282.3                           | 04Aug2013, 14:25    | 134.7                     |
| FSUT3-7                      | 0.14                                      | 59.6                            | 04Aug2013, 16:15    | 28.8                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 332.1                           | 04Aug2013, 15:35    | 163.4                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 634.7                           | 04Aug2013, 15:20    | 302.5                     |
| FSUT3-8                      | 0.08                                      | 73.7                            | 04Aug2013, 13:45    | 13.7                      |
| East Fire Tower - South      | 1.62                                      | 652.7                           | 04Aug2013, 15:15    | 316.1                     |
| FSUT3-9B                     | 0.16                                      | 51.7                            | 04Aug2013, 17:25    | 29.4                      |
| FSUT3-9A                     | 0.05                                      | 46.7                            | 04Aug2013, 14:05    | 11.1                      |
| RT FSUT3-9A                  | 0.05                                      | 45.7                            | 04Aug2013, 14:20    | 11                        |
| ADD FSUT3-9B                 | 0.22                                      | 61.6                            | 04Aug2013, 14:30    | 40.4                      |
| Corey Road - FSUT3           | 0.22                                      | 61.6                            | 04Aug2013, 14:30    | 40.4                      |
| FSUT3-9C                     | 0.16                                      | 68.4                            | 04Aug2013, 15:45    | 29.3                      |
| ADD FSUT3-9C                 | 1.99                                      | 774.5                           | 04Aug2013, 15:20    | 385.8                     |
| RT FSUT 3-9C                 | 1.99                                      | 773.3                           | 04Aug2013, 15:25    | 385                       |
| FSUT3-9D                     | 0.09                                      | 155.2                           | 04Aug2013, 13:15    | 18.8                      |
| ADD FSUT3-9D                 | 2.08                                      | 787.9                           | 04Aug2013, 15:25    | 403.8                     |
| RT FSUT3-9D                  | 2.08                                      | 786.5                           | 04Aug2013, 15:30    | 402.1                     |
| FSUT3-10A                    | 0.24                                      | 80.2                            | 04Aug2013, 16:55    | 42.3                      |
| ADD FSUT3-10A                | 2.32                                      | 850.7                           | 04Aug2013, 15:40    | 444.4                     |
| RT FSUT3-10A                 | 2.32                                      | 849.7                           | 04Aug2013, 15:40    | 443.3                     |
| FSUT3-10C                    | 0.22                                      | 77.5                            | 04Aug2013, 15:50    | 33.4                      |
| FSUT3-10B                    | 0.09                                      | 158.4                           | 04Aug2013, 13:15    | 19.2                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 940.6                           | 04Aug2013, 15:40    | 495.9                     |
| RT FSUT3                     | 2.63                                      | 940.6                           | 04Aug2013, 21:10    | 410.4                     |
| FS-1B                        | 0.13                                      | 89.5                            | 04Aug2013, 14:35    | 27.7                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR FUTURE</b>      |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FS-1A                      | 0.12                                      | 90.9                            | 04Aug2013, 14:35    | 28.4                      |
| RT FS-1A                   | 0.12                                      | 90.7                            | 04Aug2013, 14:40    | 28.4                      |
| ADD FS-1B                  | 0.25                                      | 180.1                           | 04Aug2013, 14:35    | 56.1                      |
| RT FS-1B                   | 0.25                                      | 179.2                           | 04Aug2013, 14:45    | 55.9                      |
| FS-2A                      | 0.16                                      | 95.4                            | 04Aug2013, 14:40    | 29.3                      |
| RT FS-2A                   | 0.16                                      | 95.1                            | 04Aug2013, 14:40    | 29.3                      |
| FS-2B                      | 0.08                                      | 112.2                           | 04Aug2013, 13:30    | 16.7                      |
| ADD FS-2B                  | 0.23                                      | 142.4                           | 04Aug2013, 13:30    | 46                        |
| RT FS-2B                   | 0.23                                      | 140.6                           | 04Aug2013, 13:35    | 45.9                      |
| ADD FS1-2                  | 0.48                                      | 296.1                           | 04Aug2013, 14:40    | 101.8                     |
| FS-3                       | 0.08                                      | 71                              | 04Aug2013, 14:05    | 16.8                      |
| East Baywood Lane          | 0.56                                      | 352.4                           | 04Aug2013, 14:30    | 118.6                     |
| U/S Limit FS               | 0.56                                      | 352.4                           | 04Aug2013, 14:30    | 118.6                     |
| FS-4B                      | 0.12                                      | 109.9                           | 04Aug2013, 14:05    | 26.3                      |
| FS-4A                      | 0.10                                      | 45.9                            | 04Aug2013, 15:45    | 19.7                      |
| RT FS-4A                   | 0.10                                      | 45.8                            | 04Aug2013, 15:50    | 19.7                      |
| ADD FS-4B                  | 0.22                                      | 129.3                           | 04Aug2013, 14:10    | 46                        |
| RT FS-4B                   | 0.22                                      | 124.7                           | 04Aug2013, 14:20    | 45.7                      |
| Railroad                   | 0.78                                      | 474.6                           | 04Aug2013, 14:30    | 164.2                     |
| FS-5                       | 0.05                                      | 103.1                           | 04Aug2013, 13:15    | 12.8                      |
| Evans Street               | 0.83                                      | 487.6                           | 04Aug2013, 14:30    | 176.8                     |
| FS-6A                      | 0.16                                      | 83.2                            | 04Aug2013, 15:40    | 36                        |
| FS-6B                      | 0.09                                      | 120.2                           | 04Aug2013, 13:25    | 16                        |
| RT FS-6A-6B                | 0.25                                      | 136.2                           | 04Aug2013, 13:30    | 51.9                      |
| FS-6E                      | 0.11                                      | 45.6                            | 04Aug2013, 15:45    | 19.6                      |
| FS-6D                      | 0.10                                      | 49.7                            | 04Aug2013, 15:10    | 18.4                      |
| ADD FS-6D-6E               | 0.20                                      | 93.4                            | 04Aug2013, 15:25    | 38                        |
| FS-6C                      | 0.15                                      | 100                             | 04Aug2013, 14:35    | 30.8                      |
| ADD FS-6C                  | 1.44                                      | 744                             | 04Aug2013, 14:40    | 297.5                     |
| FS-6F                      | 0.17                                      | 53.4                            | 04Aug2013, 17:25    | 30.4                      |
| ADD FS-6F                  | 1.60                                      | 764.7                           | 04Aug2013, 14:40    | 327.8                     |
| RT FS-6F                   | 1.60                                      | 756.4                           | 04Aug2013, 14:50    | 326.5                     |
| FS-7A                      | 0.15                                      | 249.2                           | 04Aug2013, 13:15    | 30.1                      |
| ADD FS-7A                  | 1.75                                      | 786.6                           | 04Aug2013, 14:45    | 356.6                     |
| RT FS-7A                   | 1.75                                      | 786                             | 04Aug2013, 14:50    | 356.1                     |
| FS-7B                      | 0.15                                      | 92.8                            | 04Aug2013, 14:40    | 28.5                      |
| ADD FS-7B                  | 1.90                                      | 877                             | 04Aug2013, 14:50    | 384.6                     |
| E Fire Tower Road (Bridge) | 1.90                                      | 877                             | 04Aug2013, 14:50    | 384.6                     |
| RT FS-7B                   | 1.90                                      | 871.3                           | 04Aug2013, 14:55    | 383.3                     |
| FS-8E                      | 0.12                                      | 107.9                           | 04Aug2013, 13:40    | 18.5                      |
| ADD FS8-E                  | 2.03                                      | 901.1                           | 04Aug2013, 14:50    | 401.8                     |
| RT FS-8E                   | 2.03                                      | 899.8                           | 04Aug2013, 14:55    | 401.3                     |
| FS-8B                      | 0.13                                      | 59.5                            | 04Aug2013, 15:00    | 20.9                      |
| FS-8C                      | 0.09                                      | 116.4                           | 04Aug2013, 13:35    | 18.7                      |
| FS-8A                      | 0.06                                      | 22.8                            | 04Aug2013, 16:20    | 11                        |
| ADD FS-8A-8B-8C            | 0.28                                      | 139.1                           | 04Aug2013, 13:35    | 50.5                      |
| RT FS-8C                   | 0.28                                      | 138.2                           | 04Aug2013, 13:45    | 50.4                      |
| FS-8D                      | 0.07                                      | 93.5                            | 04Aug2013, 13:20    | 11.2                      |
| ADD FS-8D                  | 2.38                                      | 1011.1                          | 04Aug2013, 14:50    | 462.9                     |
| ADD FSUT3 to FS            | 5.01                                      | 1123.7                          | 04Aug2013, 21:00    | 873.3                     |
| FS-9                       | 0.14                                      | 90.2                            | 04Aug2013, 14:05    | 21.5                      |
| ADD FS-9                   | 5.15                                      | 1130.2                          | 04Aug2013, 21:00    | 894.9                     |
| RT FS-9                    | 5.15                                      | 1129.2                          | 04Aug2013, 21:00    | 891.7                     |
| FSUT2-3                    | 0.21                                      | 63.8                            | 04Aug2013, 17:25    | 36.2                      |
| FSUT2-1                    | 0.14                                      | 115.4                           | 04Aug2013, 14:00    | 25.9                      |
| U/S Limit FSUT2-2          | 0.14                                      | 115.4                           | 04Aug2013, 14:00    | 25.9                      |



**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR FUTURE</b>     |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 111.2                           | 04Aug2013, 14:05    | 25.8                      |
| FSUT2-2                   | 0.03                                      | 49.9                            | 04Aug2013, 13:20    | 6                         |
| ADD FSUT2-2               | 0.17                                      | 122                             | 04Aug2013, 14:05    | 31.8                      |
| RT FSUT2-2                | 0.17                                      | 121                             | 04Aug2013, 14:10    | 31.7                      |
| ADD FSUT2-3               | 0.38                                      | 135.9                           | 04Aug2013, 14:10    | 67.9                      |
| RT FSUT2-3                | 0.38                                      | 135.7                           | 04Aug2013, 14:15    | 67.8                      |
| FSUT2-4                   | 0.14                                      | 72.2                            | 04Aug2013, 15:40    | 31.6                      |
| ADD FSUT2-4               | 0.52                                      | 179.2                           | 04Aug2013, 14:25    | 99.4                      |
| RT FSUT2-4                | 0.52                                      | 178.5                           | 04Aug2013, 14:30    | 99.1                      |
| FSUT2-5                   | 0.21                                      | 86.1                            | 04Aug2013, 16:45    | 45.9                      |
| West Fire Tower Rd        | 0.73                                      | 240.9                           | 04Aug2013, 16:20    | 144.8                     |
| D/S Limit FSUT2-2         | 0.73                                      | 240.9                           | 04Aug2013, 16:20    | 144.8                     |
| FSUT2-6                   | 0.31                                      | 114.6                           | 04Aug2013, 17:20    | 65.8                      |
| ADD FSUT2-6               | 1.05                                      | 349.9                           | 04Aug2013, 16:40    | 210.5                     |
| RT FSUT2-6                | 1.05                                      | 349.5                           | 04Aug2013, 16:50    | 209.3                     |
| FSUT2-7A                  | 0.19                                      | 63.8                            | 04Aug2013, 16:55    | 33.6                      |
| ADD FSUT2-7A              | 1.24                                      | 413.3                           | 04Aug2013, 16:50    | 242.9                     |
| RT FSUT2-7A               | 1.24                                      | 412.7                           | 04Aug2013, 16:55    | 241.9                     |
| FSUT2-7B                  | 0.42                                      | 102.7                           | 04Aug2013, 18:35    | 64.3                      |
| ADD FSUT2-7B              | 1.66                                      | 501.5                           | 04Aug2013, 17:10    | 306.1                     |
| FSUT2-8A                  | 0.27                                      | 116.4                           | 04Aug2013, 15:45    | 50                        |
| FSUT2-8B                  | 0.06                                      | 96.4                            | 04Aug2013, 13:15    | 11.6                      |
| U/S Limit FSUT2-1         | 1.99                                      | 598.3                           | 04Aug2013, 16:45    | 367.8                     |
| RT FSUT2-8A-8B            | 1.99                                      | 598.1                           | 04Aug2013, 16:50    | 366.5                     |
| FSUT2-9B                  | 0.11                                      | 75.5                            | 04Aug2013, 14:20    | 20.6                      |
| FSUT2-9A                  | 0.10                                      | 148.2                           | 04Aug2013, 13:20    | 17.8                      |
| ADD FSUT2-9A-9B           | 2.20                                      | 629                             | 04Aug2013, 16:45    | 404.9                     |
| RT FSUT2-9A-9B            | 2.20                                      | 629                             | 04Aug2013, 18:15    | 386.5                     |
| ADD FSUT2                 | 7.35                                      | 1594.5                          | 04Aug2013, 20:30    | 1278.2                    |
| FSUT1-2A                  | 0.45                                      | 82.9                            | 04Aug2013, 20:30    | 55.1                      |
| FSUT1-2B                  | 0.24                                      | 79.5                            | 04Aug2013, 17:00    | 42.5                      |
| ADD FSUT1-2A-2B           | 0.69                                      | 137.5                           | 04Aug2013, 18:15    | 97.6                      |
| FSUT1-2D                  | 0.18                                      | 106.3                           | 04Aug2013, 14:40    | 32.7                      |
| FSUT1-2C                  | 0.11                                      | 130.1                           | 04Aug2013, 13:25    | 17.3                      |
| RT FSUT1-2C               | 0.11                                      | 98.2                            | 04Aug2013, 13:40    | 17                        |
| ADD FSUT1-2D              | 0.98                                      | 189                             | 04Aug2013, 14:30    | 147.3                     |
| RT-FSUT1-2D               | 0.98                                      | 187.7                           | 04Aug2013, 14:50    | 145.2                     |
| FSUT1-2E                  | 0.17                                      | 272.9                           | 04Aug2013, 13:20    | 32.9                      |
| ADD FSUT1-2E              | 1.15                                      | 331.4                           | 04Aug2013, 13:20    | 178.1                     |
| RT FSUT1-2E               | 1.15                                      | 305.7                           | 04Aug2013, 13:25    | 177.3                     |
| FSUT1-2F                  | 0.11                                      | 60.4                            | 04Aug2013, 14:50    | 19.9                      |
| ADD FSUT1-2F              | 1.26                                      | 323.1                           | 04Aug2013, 13:25    | 197.2                     |
| RT FSUT1-2F               | 1.26                                      | 313.9                           | 04Aug2013, 13:25    | 196.8                     |
| FSUT1-1A                  | 0.40                                      | 88.2                            | 04Aug2013, 19:40    | 58.2                      |
| FSUT1-1B                  | 0.39                                      | 110.6                           | 04Aug2013, 18:10    | 67.6                      |
| RT FSUT1-1A-1B            | 0.80                                      | 192.8                           | 04Aug2013, 19:05    | 122.8                     |
| FSUT1-1C                  | 0.27                                      | 112                             | 04Aug2013, 15:45    | 48.1                      |
| U/S Limit FSUT1           | 1.07                                      | 243.5                           | 04Aug2013, 18:10    | 170.9                     |
| FSUT1-2G                  | 0.09                                      | 96.7                            | 04Aug2013, 13:50    | 19.4                      |
| Trafalgar Drive           | 1.16                                      | 251.6                           | 04Aug2013, 18:10    | 188                       |
| Corey Road - FSUT1        | 2.41                                      | 461.7                           | 04Aug2013, 17:00    | 384                       |
| FSUT1-3                   | 0.19                                      | 86                              | 04Aug2013, 14:40    | 26.8                      |
| ADD FSUT1-3               | 2.60                                      | 522.1                           | 04Aug2013, 14:55    | 410.8                     |
| RT FSUT1                  | 2.60                                      | 522.1                           | 04Aug2013, 21:15    | 247.9                     |
| FS-10C                    | 0.10                                      | 51                              | 04Aug2013, 14:50    | 16.6                      |
| ADD FSUT1                 | 10.05                                     | 2102.3                          | 04Aug2013, 20:45    | 1542.8                    |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 10-YEAR FUTURE     |                                     |                         |                  |                   |
|--------------------|-------------------------------------|-------------------------|------------------|-------------------|
| Hydrologic Element | Drainage Area<br>(mi <sup>2</sup> ) | Peak Discharge<br>(CFS) | Time of Peak     | Volume<br>(AC-FT) |
| RT FS-10           | 10.05                               | 2097.7                  | 04Aug2013, 20:50 | 1535              |
| FS-10D             | 0.18                                | 99.8                    | 04Aug2013, 14:50 | 33                |
| FS-10B             | 0.15                                | 96.2                    | 04Aug2013, 14:05 | 22.9              |
| FS-10A             | 0.03                                | 26.6                    | 04Aug2013, 14:10 | 6.6               |
| RT FS-10A          | 0.03                                | 26.3                    | 04Aug2013, 14:30 | 6.5               |
| ADD FS-10B-10C-10D | 10.42                               | 2118.4                  | 04Aug2013, 20:50 | 1597.4            |
| RT FS-10B-10D      | 10.42                               | 2115.3                  | 04Aug2013, 20:50 | 1592.2            |
| FS-10F             | 0.15                                | 127                     | 04Aug2013, 13:40 | 22.4              |
| FS-10E             | 0.07                                | 71                      | 04Aug2013, 13:35 | 11.2              |
| ADD FS-10E-10F     | 10.64                               | 2124.7                  | 04Aug2013, 20:50 | 1625.8            |
| RT FS-10E-10F      | 10.64                               | 2115.4                  | 04Aug2013, 20:55 | 1613.8            |
| OUTLET             | 10.64                               | 2115.4                  | 04Aug2013, 20:55 | 1613.8            |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>25-YEAR FUTURE</b>        |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 80.6                            | 04Aug2013, 15:05    | 30.4                      |
| FSUT3-1B                     | 0.10                                      | 113.6                           | 04Aug2013, 13:55    | 24.1                      |
| FSUT3-1C                     | 0.09                                      | 63.6                            | 04Aug2013, 14:40    | 19.6                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 214.9                           | 04Aug2013, 14:15    | 74                        |
| FSUT3-1D                     | 0.17                                      | 104.9                           | 04Aug2013, 15:40    | 45.4                      |
| RT FSUT3-1D                  | 0.17                                      | 104.9                           | 04Aug2013, 15:40    | 45.4                      |
| FSUT3-1E                     | 0.04                                      | 62.7                            | 04Aug2013, 13:25    | 8.3                       |
| U/S Limit FSUT3              | 0.49                                      | 294                             | 04Aug2013, 14:40    | 127.8                     |
| RT FSUT3-1E                  | 0.49                                      | 293.3                           | 04Aug2013, 14:45    | 127.3                     |
| FSUT3-2A                     | 0.08                                      | 46.6                            | 04Aug2013, 15:15    | 17.4                      |
| ADD FSUT3-2A                 | 0.58                                      | 337.8                           | 04Aug2013, 14:55    | 144.7                     |
| RT FSUT3-2A                  | 0.58                                      | 337.4                           | 04Aug2013, 15:00    | 144.4                     |
| FSUT3-2B                     | 0.11                                      | 63.9                            | 04Aug2013, 15:10    | 23.7                      |
| ADD FSUT3-2B                 | 0.69                                      | 400.4                           | 04Aug2013, 15:00    | 168.2                     |
| RT FSUT3-2B                  | 0.69                                      | 398.1                           | 04Aug2013, 15:10    | 167.4                     |
| FSUT3-3                      | 0.09                                      | 192.5                           | 04Aug2013, 13:15    | 23.3                      |
| ADD FSUT3-3                  | 0.78                                      | 418.8                           | 04Aug2013, 15:05    | 190.6                     |
| Coleman Drive                | 0.78                                      | 418.5                           | 04Aug2013, 15:05    | 190.6                     |
| FSUT3-5                      | 0.16                                      | 150.3                           | 04Aug2013, 14:35    | 47.1                      |
| Country Home Road            | 0.16                                      | 150                             | 04Aug2013, 14:40    | 47.1                      |
| RT FSUT3-5                   | 0.16                                      | 150                             | 04Aug2013, 14:40    | 47.1                      |
| FSUT3-6                      | 0.11                                      | 107.5                           | 04Aug2013, 14:35    | 34                        |
| ADD FSUT3-6                  | 0.27                                      | 257.4                           | 04Aug2013, 14:35    | 81                        |
| East Fire Tower Road - North | 0.27                                      | 230.4                           | 04Aug2013, 15:05    | 81                        |
| FSUT3-4C                     | 0.13                                      | 72                              | 04Aug2013, 16:15    | 34.9                      |
| FSUT3-4B                     | 0.07                                      | 95.5                            | 04Aug2013, 13:55    | 20.9                      |
| FSUT3-4A                     | 0.07                                      | 35.9                            | 04Aug2013, 16:15    | 17.4                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 131.6                           | 04Aug2013, 14:00    | 73.1                      |
| RT FSUT3-4C                  | 0.27                                      | 131.3                           | 04Aug2013, 14:10    | 72.8                      |
| FSUT3-4D                     | 0.08                                      | 200.8                           | 04Aug2013, 13:15    | 24.6                      |
| ADD FSUT3-4D                 | 0.62                                      | 369.8                           | 04Aug2013, 15:05    | 178.5                     |
| Wimbledon Drive              | 0.62                                      | 369.4                           | 04Aug2013, 15:10    | 178.2                     |
| FSUT3-7                      | 0.14                                      | 79.2                            | 04Aug2013, 16:15    | 38.5                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 436                             | 04Aug2013, 15:20    | 216.6                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 852.3                           | 04Aug2013, 15:15    | 407.2                     |
| FSUT3-8                      | 0.08                                      | 101.6                           | 04Aug2013, 13:45    | 18.9                      |
| East Fire Tower - South      | 1.62                                      | 876.2                           | 04Aug2013, 15:15    | 426                       |
| FSUT3-9B                     | 0.16                                      | 69.9                            | 04Aug2013, 17:20    | 39.9                      |
| FSUT3-9A                     | 0.05                                      | 61.8                            | 04Aug2013, 14:05    | 14.8                      |
| RT FSUT3-9A                  | 0.05                                      | 60.5                            | 04Aug2013, 14:20    | 14.7                      |
| ADD FSUT3-9B                 | 0.22                                      | 83.2                            | 04Aug2013, 14:30    | 54.6                      |
| Corey Road - FSUT3           | 0.22                                      | 83.2                            | 04Aug2013, 14:30    | 54.6                      |
| FSUT3-9C                     | 0.16                                      | 92.9                            | 04Aug2013, 15:45    | 40                        |
| ADD FSUT3-9C                 | 1.99                                      | 1041.4                          | 04Aug2013, 15:20    | 520.6                     |
| RT FSUT 3-9C                 | 1.99                                      | 1038.5                          | 04Aug2013, 15:20    | 519.5                     |
| FSUT3-9D                     | 0.09                                      | 205.2                           | 04Aug2013, 13:15    | 25.1                      |
| ADD FSUT3-9D                 | 2.08                                      | 1057.5                          | 04Aug2013, 15:20    | 544.5                     |
| RT FSUT3-9D                  | 2.08                                      | 1054.5                          | 04Aug2013, 15:25    | 542.8                     |
| FSUT3-10A                    | 0.24                                      | 109.8                           | 04Aug2013, 16:50    | 58                        |
| ADD FSUT3-10A                | 2.32                                      | 1141.5                          | 04Aug2013, 15:35    | 600.8                     |
| RT FSUT3-10A                 | 2.32                                      | 1140.1                          | 04Aug2013, 15:35    | 599.5                     |
| FSUT3-10C                    | 0.22                                      | 109.5                           | 04Aug2013, 15:45    | 47                        |
| FSUT3-10B                    | 0.09                                      | 208.3                           | 04Aug2013, 13:15    | 25.5                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 1266.7                          | 04Aug2013, 15:35    | 672                       |
| RT FSUT3                     | 2.63                                      | 1266.7                          | 04Aug2013, 21:05    | 560.8                     |
| FS-1B                        | 0.13                                      | 118.1                           | 04Aug2013, 14:35    | 36.7                      |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 25-YEAR FUTURE             |                                  |                      |                  |                |
|----------------------------|----------------------------------|----------------------|------------------|----------------|
| Hydrologic Element         | Drainage Area (mi <sup>2</sup> ) | Peak Discharge (CFS) | Time of Peak     | Volume (AC-FT) |
| FS-1A                      | 0.12                             | 117.4                | 04Aug2013, 14:35 | 37.1           |
| RT FS-1A                   | 0.12                             | 117.2                | 04Aug2013, 14:40 | 37.1           |
| ADD FS-1B                  | 0.25                             | 235.1                | 04Aug2013, 14:35 | 73.8           |
| RT FS-1B                   | 0.25                             | 233.9                | 04Aug2013, 14:40 | 73.6           |
| FS-2A                      | 0.16                             | 129.5                | 04Aug2013, 14:35 | 39.9           |
| RT FS-2A                   | 0.16                             | 129                  | 04Aug2013, 14:40 | 39.8           |
| FS-2B                      | 0.08                             | 147.2                | 04Aug2013, 13:30 | 22.2           |
| ADD FS-2B                  | 0.23                             | 191.5                | 04Aug2013, 13:30 | 62             |
| RT FS-2B                   | 0.23                             | 189.5                | 04Aug2013, 13:35 | 61.9           |
| ADD FS1-2                  | 0.48                             | 391.2                | 04Aug2013, 14:40 | 135.5          |
| FS-3                       | 0.08                             | 95.1                 | 04Aug2013, 14:05 | 22.7           |
| East Baywood Lane          | 0.56                             | 467.7                | 04Aug2013, 14:30 | 158.1          |
| U/S Limit FS               | 0.56                             | 467.7                | 04Aug2013, 14:30 | 158.1          |
| FS-4B                      | 0.12                             | 143.8                | 04Aug2013, 14:05 | 34.7           |
| FS-4A                      | 0.10                             | 61.4                 | 04Aug2013, 15:40 | 26.5           |
| RT FS-4A                   | 0.10                             | 61.3                 | 04Aug2013, 15:45 | 26.4           |
| ADD FS-4B                  | 0.22                             | 171                  | 04Aug2013, 14:10 | 61.2           |
| RT FS-4B                   | 0.22                             | 165.2                | 04Aug2013, 14:15 | 60.9           |
| Railroad                   | 0.78                             | 629.3                | 04Aug2013, 14:30 | 218.9          |
| FS-5                       | 0.05                             | 132.2                | 04Aug2013, 13:15 | 16.6           |
| Evans Street               | 0.83                             | 643.8                | 04Aug2013, 14:35 | 235.1          |
| FS-6A                      | 0.16                             | 108.8                | 04Aug2013, 15:40 | 47.5           |
| FS-6B                      | 0.09                             | 165.1                | 04Aug2013, 13:25 | 22.1           |
| RT FS-6A-6B                | 0.25                             | 188.1                | 04Aug2013, 13:30 | 69.4           |
| FS-6E                      | 0.11                             | 61.9                 | 04Aug2013, 15:45 | 26.6           |
| FS-6D                      | 0.10                             | 67.5                 | 04Aug2013, 15:10 | 25.1           |
| ADD FS-6D-6E               | 0.20                             | 127                  | 04Aug2013, 15:20 | 51.7           |
| FS-6C                      | 0.15                             | 133.5                | 04Aug2013, 14:35 | 41.3           |
| ADD FS-6C                  | 1.44                             | 991.8                | 04Aug2013, 14:40 | 397.5          |
| FS-6F                      | 0.17                             | 71.9                 | 04Aug2013, 17:20 | 41.1           |
| ADD FS-6F                  | 1.60                             | 1022                 | 04Aug2013, 14:45 | 438.6          |
| RT FS-6F                   | 1.60                             | 1012.3               | 04Aug2013, 14:50 | 437            |
| FS-7A                      | 0.15                             | 333.5                | 04Aug2013, 13:15 | 40.5           |
| ADD FS-7A                  | 1.75                             | 1051.2               | 04Aug2013, 14:45 | 477.5          |
| RT FS-7A                   | 1.75                             | 1050.5               | 04Aug2013, 14:50 | 476.9          |
| FS-7B                      | 0.15                             | 126.1                | 04Aug2013, 14:35 | 38.8           |
| ADD FS-7B                  | 1.90                             | 1173.5               | 04Aug2013, 14:50 | 515.7          |
| E Fire Tower Road (Bridge) | 1.90                             | 1173.5               | 04Aug2013, 14:50 | 515.7          |
| RT FS-7B                   | 1.90                             | 1166.6               | 04Aug2013, 14:50 | 514.1          |
| FS-8E                      | 0.12                             | 153.8                | 04Aug2013, 13:40 | 26.2           |
| ADD FS8-E                  | 2.03                             | 1208.2               | 04Aug2013, 14:50 | 540.3          |
| RT FS-8E                   | 2.03                             | 1207.1               | 04Aug2013, 14:50 | 539.8          |
| FS-8B                      | 0.13                             | 82.9                 | 04Aug2013, 15:00 | 29.1           |
| FS-8C                      | 0.09                             | 156.3                | 04Aug2013, 13:35 | 25.2           |
| FS-8A                      | 0.06                             | 31.4                 | 04Aug2013, 16:15 | 15.1           |
| ADD FS-8A-8B-8C            | 0.28                             | 190.8                | 04Aug2013, 13:35 | 69.4           |
| RT FS-8C                   | 0.28                             | 188.9                | 04Aug2013, 13:45 | 69.3           |
| FS-8D                      | 0.07                             | 130.9                | 04Aug2013, 13:20 | 15.7           |
| ADD FS-8D                  | 2.38                             | 1360                 | 04Aug2013, 14:50 | 624.8          |
| ADD FSUT3 to FS            | 5.01                             | 1504.8               | 04Aug2013, 21:00 | 1185.6         |
| FS-9                       | 0.14                             | 128.2                | 04Aug2013, 14:05 | 30.4           |
| ADD FS-9                   | 5.15                             | 1513.3               | 04Aug2013, 21:00 | 1215.9         |
| RT FS-9                    | 5.15                             | 1511.5               | 04Aug2013, 21:00 | 1212.1         |
| FSUT2-3                    | 0.21                             | 87.4                 | 04Aug2013, 17:25 | 49.7           |
| FSUT2-1                    | 0.14                             | 156.4                | 04Aug2013, 14:00 | 35.2           |
| U/S Limit FSUT2-2          | 0.14                             | 156.4                | 04Aug2013, 14:00 | 35.2           |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>25-YEAR FUTURE</b>     |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 151.2                           | 04Aug2013, 14:05    | 35.1                      |
| FSUT2-2                   | 0.03                                      | 67.5                            | 04Aug2013, 13:15    | 8.2                       |
| ADD FSUT2-2               | 0.17                                      | 165.4                           | 04Aug2013, 14:00    | 43.3                      |
| RT FSUT2-2                | 0.17                                      | 164.7                           | 04Aug2013, 14:05    | 43.2                      |
| ADD FSUT2-3               | 0.38                                      | 186.5                           | 04Aug2013, 14:10    | 92.9                      |
| RT FSUT2-3                | 0.38                                      | 186.1                           | 04Aug2013, 14:10    | 92.8                      |
| FSUT2-4                   | 0.14                                      | 94                              | 04Aug2013, 15:40    | 41.5                      |
| ADD FSUT2-4               | 0.52                                      | 242                             | 04Aug2013, 14:25    | 134.2                     |
| RT FSUT2-4                | 0.52                                      | 241.1                           | 04Aug2013, 14:30    | 133.9                     |
| FSUT2-5                   | 0.21                                      | 112.7                           | 04Aug2013, 16:45    | 60.5                      |
| West Fire Tower Rd        | 0.73                                      | 318.9                           | 04Aug2013, 16:20    | 194                       |
| D/S Limit FSUT2-2         | 0.73                                      | 318.9                           | 04Aug2013, 16:20    | 194                       |
| FSUT2-6                   | 0.31                                      | 150.1                           | 04Aug2013, 17:20    | 86.8                      |
| ADD FSUT2-6               | 1.05                                      | 462.2                           | 04Aug2013, 16:40    | 280.8                     |
| RT FSUT2-6                | 1.05                                      | 461.7                           | 04Aug2013, 16:50    | 279.3                     |
| FSUT2-7A                  | 0.19                                      | 87.3                            | 04Aug2013, 16:50    | 46.1                      |
| ADD FSUT2-7A              | 1.24                                      | 549                             | 04Aug2013, 16:50    | 325.4                     |
| RT FSUT2-7A               | 1.24                                      | 548.3                           | 04Aug2013, 16:55    | 324.1                     |
| FSUT2-7B                  | 0.42                                      | 141.4                           | 04Aug2013, 18:30    | 88.9                      |
| ADD FSUT2-7B              | 1.66                                      | 671.7                           | 04Aug2013, 17:10    | 413.1                     |
| FSUT2-8A                  | 0.27                                      | 158.3                           | 04Aug2013, 15:45    | 68.1                      |
| FSUT2-8B                  | 0.06                                      | 129.1                           | 04Aug2013, 13:15    | 15.7                      |
| U/S Limit FSUT2-1         | 1.99                                      | 803                             | 04Aug2013, 16:45    | 496.8                     |
| RT FSUT2-8A-8B            | 1.99                                      | 802.7                           | 04Aug2013, 16:50    | 495.2                     |
| FSUT2-9B                  | 0.11                                      | 103.2                           | 04Aug2013, 14:20    | 28.2                      |
| FSUT2-9A                  | 0.10                                      | 202.6                           | 04Aug2013, 13:15    | 24.4                      |
| ADD FSUT2-9A-9B           | 2.20                                      | 844.2                           | 04Aug2013, 16:40    | 547.9                     |
| RT FSUT2-9A-9B            | 2.20                                      | 844.2                           | 04Aug2013, 18:10    | 524                       |
| ADD FSUT2                 | 7.35                                      | 2121.3                          | 04Aug2013, 20:25    | 1736.2                    |
| FSUT1-2A                  | 0.45                                      | 115.6                           | 04Aug2013, 20:25    | 77.4                      |
| FSUT1-2B                  | 0.24                                      | 108.2                           | 04Aug2013, 16:55    | 58                        |
| ADD FSUT1-2A-2B           | 0.69                                      | 190                             | 04Aug2013, 18:10    | 135.4                     |
| FSUT1-2D                  | 0.18                                      | 145.1                           | 04Aug2013, 14:35    | 44.7                      |
| FSUT1-2C                  | 0.11                                      | 183.7                           | 04Aug2013, 13:25    | 24.5                      |
| RT FSUT1-2C               | 0.11                                      | 140.3                           | 04Aug2013, 13:40    | 24.1                      |
| ADD FSUT1-2D              | 0.98                                      | 261.3                           | 04Aug2013, 14:20    | 204.2                     |
| RT-FSUT1-2D               | 0.98                                      | 259.5                           | 04Aug2013, 14:45    | 201.6                     |
| FSUT1-2E                  | 0.17                                      | 369.7                           | 04Aug2013, 13:15    | 44.7                      |
| ADD FSUT1-2E              | 1.15                                      | 471                             | 04Aug2013, 13:20    | 246.4                     |
| RT FSUT1-2E               | 1.15                                      | 436.9                           | 04Aug2013, 13:20    | 245.4                     |
| FSUT1-2F                  | 0.11                                      | 81.9                            | 04Aug2013, 14:50    | 27                        |
| ADD FSUT1-2F              | 1.26                                      | 461.7                           | 04Aug2013, 13:25    | 272.4                     |
| RT FSUT1-2F               | 1.26                                      | 450.2                           | 04Aug2013, 13:25    | 272                       |
| FSUT1-1A                  | 0.40                                      | 120.8                           | 04Aug2013, 19:35    | 80.3                      |
| FSUT1-1B                  | 0.39                                      | 149.6                           | 04Aug2013, 18:05    | 91.9                      |
| RT FSUT1-1A-1B            | 0.80                                      | 262.6                           | 04Aug2013, 18:55    | 168.5                     |
| FSUT1-1C                  | 0.27                                      | 153.3                           | 04Aug2013, 15:45    | 65.9                      |
| U/S Limit FSUT1           | 1.07                                      | 332.3                           | 04Aug2013, 18:00    | 234.4                     |
| FSUT1-2G                  | 0.09                                      | 127.9                           | 04Aug2013, 13:50    | 25.8                      |
| Trafalgar Drive           | 1.16                                      | 342.7                           | 04Aug2013, 18:05    | 257.2                     |
| Corey Road - FSUT1        | 2.41                                      | 630.3                           | 04Aug2013, 16:30    | 528.2                     |
| FSUT1-3                   | 0.19                                      | 124.1                           | 04Aug2013, 14:40    | 38.3                      |
| ADD FSUT1-3               | 2.60                                      | 728                             | 04Aug2013, 15:10    | 566.5                     |
| RT FSUT1                  | 2.60                                      | 728                             | 04Aug2013, 21:30    | 348.6                     |
| FS-10C                    | 0.10                                      | 71.5                            | 04Aug2013, 14:45    | 23.2                      |
| ADD FSUT1                 | 10.05                                     | 2825.6                          | 04Aug2013, 20:45    | 2107.9                    |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 25-YEAR FUTURE     |                                     |                         |                  |                   |
|--------------------|-------------------------------------|-------------------------|------------------|-------------------|
| Hydrologic Element | Drainage Area<br>(mi <sup>2</sup> ) | Peak Discharge<br>(CFS) | Time of Peak     | Volume<br>(AC-FT) |
| RT FS-10           | 10.05                               | 2820.8                  | 04Aug2013, 20:50 | 2098.4            |
| FS-10D             | 0.18                                | 136.4                   | 04Aug2013, 14:50 | 45.2              |
| FS-10B             | 0.15                                | 137.7                   | 04Aug2013, 14:05 | 32.5              |
| FS-10A             | 0.03                                | 35.8                    | 04Aug2013, 14:10 | 8.9               |
| RT FS-10A          | 0.03                                | 35.5                    | 04Aug2013, 14:30 | 8.8               |
| ADD FS-10B-10C-10D | 10.42                               | 2847.8                  | 04Aug2013, 20:50 | 2184.8            |
| RT FS-10B-10D      | 10.42                               | 2844.8                  | 04Aug2013, 20:50 | 2178.5            |
| FS-10F             | 0.15                                | 182.7                   | 04Aug2013, 13:40 | 32                |
| FS-10E             | 0.07                                | 98.3                    | 04Aug2013, 13:35 | 15.6              |
| ADD FS-10E-10F     | 10.64                               | 2857.3                  | 04Aug2013, 20:50 | 2226              |
| RT FS-10E-10F      | 10.64                               | 2847.7                  | 04Aug2013, 20:55 | 2211.1            |
| OUTLET             | 10.64                               | 2847.7                  | 04Aug2013, 20:55 | 2211.1            |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR FUTURE</b>        |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 97.5                            | 04Aug2013, 15:05    | 36.9                      |
| FSUT3-1B                     | 0.10                                      | 140.3                           | 04Aug2013, 13:55    | 29.9                      |
| FSUT3-1C                     | 0.09                                      | 80.5                            | 04Aug2013, 14:40    | 24.8                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 266.2                           | 04Aug2013, 14:15    | 91.6                      |
| FSUT3-1D                     | 0.17                                      | 127.6                           | 04Aug2013, 15:40    | 55.5                      |
| RT FSUT3-1D                  | 0.17                                      | 127.6                           | 04Aug2013, 15:40    | 55.5                      |
| FSUT3-1E                     | 0.04                                      | 79                              | 04Aug2013, 13:25    | 10.6                      |
| U/S Limit FSUT3              | 0.49                                      | 362.2                           | 04Aug2013, 14:35    | 157.6                     |
| RT FSUT3-1E                  | 0.49                                      | 361.3                           | 04Aug2013, 14:40    | 157.2                     |
| FSUT3-2A                     | 0.08                                      | 59.4                            | 04Aug2013, 15:10    | 22.1                      |
| ADD FSUT3-2A                 | 0.58                                      | 417.6                           | 04Aug2013, 14:50    | 179.2                     |
| RT FSUT3-2A                  | 0.58                                      | 417.2                           | 04Aug2013, 14:55    | 178.9                     |
| FSUT3-2B                     | 0.11                                      | 81                              | 04Aug2013, 15:10    | 30.1                      |
| ADD FSUT3-2B                 | 0.69                                      | 496.8                           | 04Aug2013, 15:00    | 209                       |
| RT FSUT3-2B                  | 0.69                                      | 494.2                           | 04Aug2013, 15:05    | 208.2                     |
| FSUT3-3                      | 0.09                                      | 237.8                           | 04Aug2013, 13:15    | 28.8                      |
| ADD FSUT3-3                  | 0.78                                      | 519.4                           | 04Aug2013, 15:00    | 237                       |
| Coleman Drive                | 0.78                                      | 519.3                           | 04Aug2013, 15:05    | 237                       |
| FSUT3-5                      | 0.16                                      | 180.8                           | 04Aug2013, 14:35    | 57.1                      |
| Country Home Road            | 0.16                                      | 180.5                           | 04Aug2013, 14:35    | 57.1                      |
| RT FSUT3-5                   | 0.16                                      | 180.5                           | 04Aug2013, 14:35    | 57.1                      |
| FSUT3-6                      | 0.11                                      | 128.5                           | 04Aug2013, 14:35    | 40.9                      |
| ADD FSUT3-6                  | 0.27                                      | 309                             | 04Aug2013, 14:35    | 98                        |
| East Fire Tower Road - North | 0.27                                      | 273.1                           | 04Aug2013, 15:05    | 98                        |
| FSUT3-4C                     | 0.13                                      | 87.9                            | 04Aug2013, 16:15    | 42.8                      |
| FSUT3-4B                     | 0.07                                      | 114.4                           | 04Aug2013, 13:55    | 25.2                      |
| FSUT3-4A                     | 0.07                                      | 44                              | 04Aug2013, 16:15    | 21.4                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 160.4                           | 04Aug2013, 14:00    | 89.4                      |
| RT FSUT3-4C                  | 0.27                                      | 159.9                           | 04Aug2013, 14:10    | 89.1                      |
| FSUT3-4D                     | 0.08                                      | 242.7                           | 04Aug2013, 13:15    | 30                        |
| ADD FSUT3-4D                 | 0.62                                      | 442.9                           | 04Aug2013, 15:05    | 217                       |
| Wimbledon Drive              | 0.62                                      | 442.7                           | 04Aug2013, 15:10    | 216.7                     |
| FSUT3-7                      | 0.14                                      | 96.4                            | 04Aug2013, 16:15    | 47.1                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 526.5                           | 04Aug2013, 15:25    | 263.7                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 1039.4                          | 04Aug2013, 15:15    | 500.7                     |
| FSUT3-8                      | 0.08                                      | 126.3                           | 04Aug2013, 13:45    | 23.6                      |
| East Fire Tower - South      | 1.62                                      | 1069.3                          | 04Aug2013, 15:15    | 524.2                     |
| FSUT3-9B                     | 0.16                                      | 86.1                            | 04Aug2013, 17:20    | 49.3                      |
| FSUT3-9A                     | 0.05                                      | 75                              | 04Aug2013, 14:05    | 18.1                      |
| RT FSUT3-9A                  | 0.05                                      | 73.3                            | 04Aug2013, 14:20    | 18                        |
| ADD FSUT3-9B                 | 0.22                                      | 102.3                           | 04Aug2013, 14:25    | 67.3                      |
| Corey Road - FSUT3           | 0.22                                      | 102.3                           | 04Aug2013, 14:25    | 67.3                      |
| FSUT3-9C                     | 0.16                                      | 114.7                           | 04Aug2013, 15:40    | 49.5                      |
| ADD FSUT3-9C                 | 1.99                                      | 1272.6                          | 04Aug2013, 15:15    | 641                       |
| RT FSUT 3-9C                 | 1.99                                      | 1270.3                          | 04Aug2013, 15:20    | 639.7                     |
| FSUT3-9D                     | 0.09                                      | 248.9                           | 04Aug2013, 13:15    | 30.6                      |
| ADD FSUT3-9D                 | 2.08                                      | 1293.2                          | 04Aug2013, 15:15    | 670.3                     |
| RT FSUT3-9D                  | 2.08                                      | 1290.7                          | 04Aug2013, 15:25    | 668.2                     |
| FSUT3-10A                    | 0.24                                      | 136.1                           | 04Aug2013, 16:50    | 72.1                      |
| ADD FSUT3-10A                | 2.32                                      | 1398.5                          | 04Aug2013, 15:30    | 740.3                     |
| RT FSUT3-10A                 | 2.32                                      | 1396.8                          | 04Aug2013, 15:35    | 738.9                     |
| FSUT3-10C                    | 0.22                                      | 138.4                           | 04Aug2013, 15:45    | 59.4                      |
| FSUT3-10B                    | 0.09                                      | 251.7                           | 04Aug2013, 13:15    | 31.1                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 1555.6                          | 04Aug2013, 15:35    | 829.3                     |
| RT FSUT3                     | 2.63                                      | 1555.6                          | 04Aug2013, 21:05    | 696                       |
| FS-1B                        | 0.13                                      | 143                             | 04Aug2013, 14:35    | 44.8                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR FUTURE</b>      |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FS-1A                      | 0.12                                      | 140.4                           | 04Aug2013, 14:35    | 44.7                      |
| RT FS-1A                   | 0.12                                      | 140.1                           | 04Aug2013, 14:35    | 44.7                      |
| ADD FS-1B                  | 0.25                                      | 283.1                           | 04Aug2013, 14:35    | 89.5                      |
| RT FS-1B                   | 0.25                                      | 281.6                           | 04Aug2013, 14:40    | 89.3                      |
| FS-2A                      | 0.16                                      | 159.7                           | 04Aug2013, 14:35    | 49.4                      |
| RT FS-2A                   | 0.16                                      | 159.2                           | 04Aug2013, 14:40    | 49.3                      |
| FS-2B                      | 0.08                                      | 177.7                           | 04Aug2013, 13:30    | 27                        |
| ADD FS-2B                  | 0.23                                      | 234.7                           | 04Aug2013, 13:30    | 76.3                      |
| RT FS-2B                   | 0.23                                      | 232.2                           | 04Aug2013, 13:35    | 76.2                      |
| ADD FS1-2                  | 0.48                                      | 474.7                           | 04Aug2013, 14:35    | 165.5                     |
| FS-3                       | 0.08                                      | 116.2                           | 04Aug2013, 14:05    | 27.9                      |
| East Baywood Lane          | 0.56                                      | 569.1                           | 04Aug2013, 14:30    | 193.2                     |
| U/S Limit FS               | 0.56                                      | 569.1                           | 04Aug2013, 14:30    | 193.2                     |
| FS-4B                      | 0.12                                      | 173.4                           | 04Aug2013, 14:05    | 42.2                      |
| FS-4A                      | 0.10                                      | 75                              | 04Aug2013, 15:40    | 32.5                      |
| RT FS-4A                   | 0.10                                      | 74.8                            | 04Aug2013, 15:45    | 32.5                      |
| ADD FS-4B                  | 0.22                                      | 207.6                           | 04Aug2013, 14:10    | 74.6                      |
| RT FS-4B                   | 0.22                                      | 200.6                           | 04Aug2013, 14:15    | 74.3                      |
| Railroad                   | 0.78                                      | 765.1                           | 04Aug2013, 14:30    | 267.4                     |
| FS-5                       | 0.05                                      | 157.4                           | 04Aug2013, 13:15    | 20                        |
| Evans Street               | 0.83                                      | 785.4                           | 04Aug2013, 14:30    | 286.9                     |
| FS-6A                      | 0.16                                      | 131.1                           | 04Aug2013, 15:40    | 57.6                      |
| FS-6B                      | 0.09                                      | 204.8                           | 04Aug2013, 13:25    | 27.6                      |
| RT FS-6A-6B                | 0.25                                      | 233.7                           | 04Aug2013, 13:30    | 85                        |
| FS-6E                      | 0.11                                      | 76.5                            | 04Aug2013, 15:40    | 33                        |
| FS-6D                      | 0.10                                      | 83.3                            | 04Aug2013, 15:10    | 31.1                      |
| ADD FS-6D-6E               | 0.20                                      | 156.8                           | 04Aug2013, 15:20    | 64                        |
| FS-6C                      | 0.15                                      | 162.8                           | 04Aug2013, 14:35    | 50.7                      |
| ADD FS-6C                  | 1.44                                      | 1205.5                          | 04Aug2013, 14:40    | 486.6                     |
| FS-6F                      | 0.17                                      | 88.2                            | 04Aug2013, 17:20    | 50.6                      |
| ADD FS-6F                  | 1.60                                      | 1243                            | 04Aug2013, 14:40    | 537.2                     |
| RT FS-6F                   | 1.60                                      | 1231.4                          | 04Aug2013, 14:45    | 535.3                     |
| FS-7A                      | 0.15                                      | 407.2                           | 04Aug2013, 13:15    | 49.8                      |
| ADD FS-7A                  | 1.75                                      | 1279.1                          | 04Aug2013, 14:45    | 585.1                     |
| RT FS-7A                   | 1.75                                      | 1278.2                          | 04Aug2013, 14:45    | 584.4                     |
| FS-7B                      | 0.15                                      | 155.4                           | 04Aug2013, 14:35    | 48.1                      |
| ADD FS-7B                  | 1.90                                      | 1431.8                          | 04Aug2013, 14:45    | 632.5                     |
| E Fire Tower Road (Bridge) | 1.90                                      | 1431.8                          | 04Aug2013, 14:45    | 632.5                     |
| RT FS-7B                   | 1.90                                      | 1423.3                          | 04Aug2013, 14:50    | 630.6                     |
| FS-8E                      | 0.12                                      | 195.1                           | 04Aug2013, 13:40    | 33.3                      |
| ADD FS8-E                  | 2.03                                      | 1477.9                          | 04Aug2013, 14:45    | 663.9                     |
| RT FS-8E                   | 2.03                                      | 1476.7                          | 04Aug2013, 14:45    | 663.2                     |
| FS-8B                      | 0.13                                      | 103.8                           | 04Aug2013, 15:00    | 36.4                      |
| FS-8C                      | 0.09                                      | 191.3                           | 04Aug2013, 13:35    | 31.1                      |
| FS-8A                      | 0.06                                      | 39                              | 04Aug2013, 16:15    | 18.8                      |
| ADD FS-8A-8B-8C            | 0.28                                      | 236.7                           | 04Aug2013, 13:35    | 86.4                      |
| RT FS-8C                   | 0.28                                      | 234.6                           | 04Aug2013, 13:40    | 86.2                      |
| FS-8D                      | 0.07                                      | 164.3                           | 04Aug2013, 13:15    | 19.8                      |
| ADD FS-8D                  | 2.38                                      | 1667.6                          | 04Aug2013, 14:45    | 769.3                     |
| ADD FSUT3 to FS            | 5.01                                      | 1842.9                          | 04Aug2013, 20:55    | 1465.3                    |
| FS-9                       | 0.14                                      | 162.4                           | 04Aug2013, 14:05    | 38.4                      |
| ADD FS-9                   | 5.15                                      | 1853.3                          | 04Aug2013, 20:55    | 1503.7                    |
| RT FS-9                    | 5.15                                      | 1851.7                          | 04Aug2013, 20:55    | 1499.3                    |
| FSUT2-3                    | 0.21                                      | 108.3                           | 04Aug2013, 17:20    | 61.8                      |
| FSUT2-1                    | 0.14                                      | 192.5                           | 04Aug2013, 14:00    | 43.6                      |
| U/S Limit FSUT2-2          | 0.14                                      | 192.5                           | 04Aug2013, 14:00    | 43.6                      |



**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR FUTURE</b>     |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 186.3                           | 04Aug2013, 14:05    | 43.4                      |
| FSUT2-2                   | 0.03                                      | 83.1                            | 04Aug2013, 13:15    | 10.1                      |
| ADD FSUT2-2               | 0.17                                      | 204                             | 04Aug2013, 14:00    | 53.5                      |
| RT FSUT2-2                | 0.17                                      | 203                             | 04Aug2013, 14:05    | 53.4                      |
| ADD FSUT2-3               | 0.38                                      | 231                             | 04Aug2013, 14:10    | 115.3                     |
| RT FSUT2-3                | 0.38                                      | 230.8                           | 04Aug2013, 14:10    | 115.2                     |
| FSUT2-4                   | 0.14                                      | 112.9                           | 04Aug2013, 15:40    | 50.1                      |
| ADD FSUT2-4               | 0.52                                      | 297.5                           | 04Aug2013, 14:20    | 165.3                     |
| RT FSUT2-4                | 0.52                                      | 296.4                           | 04Aug2013, 14:25    | 164.8                     |
| FSUT2-5                   | 0.21                                      | 136                             | 04Aug2013, 16:45    | 73.4                      |
| West Fire Tower Rd        | 0.73                                      | 388.5                           | 04Aug2013, 16:15    | 237.9                     |
| D/S Limit FSUT2-2         | 0.73                                      | 388.5                           | 04Aug2013, 16:15    | 237.9                     |
| FSUT2-6                   | 0.31                                      | 181.1                           | 04Aug2013, 17:15    | 105.4                     |
| ADD FSUT2-6               | 1.05                                      | 559.7                           | 04Aug2013, 16:35    | 343.2                     |
| RT FSUT2-6                | 1.05                                      | 559.1                           | 04Aug2013, 16:45    | 341.5                     |
| FSUT2-7A                  | 0.19                                      | 108.2                           | 04Aug2013, 16:50    | 57.4                      |
| ADD FSUT2-7A              | 1.24                                      | 667.2                           | 04Aug2013, 16:45    | 398.8                     |
| RT FSUT2-7A               | 1.24                                      | 666.5                           | 04Aug2013, 16:50    | 397.3                     |
| FSUT2-7B                  | 0.42                                      | 176                             | 04Aug2013, 18:30    | 111.2                     |
| ADD FSUT2-7B              | 1.66                                      | 819.1                           | 04Aug2013, 17:05    | 508.5                     |
| FSUT2-8A                  | 0.27                                      | 195.4                           | 04Aug2013, 15:40    | 84.3                      |
| FSUT2-8B                  | 0.06                                      | 157.6                           | 04Aug2013, 13:15    | 19.3                      |
| U/S Limit FSUT2-1         | 1.99                                      | 983.7                           | 04Aug2013, 16:40    | 612                       |
| RT FSUT2-8A-8B            | 1.99                                      | 983.1                           | 04Aug2013, 16:45    | 610.2                     |
| FSUT2-9B                  | 0.11                                      | 127.6                           | 04Aug2013, 14:20    | 35                        |
| FSUT2-9A                  | 0.10                                      | 251.2                           | 04Aug2013, 13:15    | 30.4                      |
| ADD FSUT2-9A-9B           | 2.20                                      | 1034.5                          | 04Aug2013, 16:35    | 675.6                     |
| RT FSUT2-9A-9B            | 2.20                                      | 1034.5                          | 04Aug2013, 18:05    | 647                       |
| ADD FSUT2                 | 7.35                                      | 2613.6                          | 04Aug2013, 19:20    | 2146.3                    |
| FSUT1-2A                  | 0.45                                      | 144.9                           | 04Aug2013, 20:20    | 97.7                      |
| FSUT1-2B                  | 0.24                                      | 133.7                           | 04Aug2013, 16:55    | 71.9                      |
| ADD FSUT1-2A-2B           | 0.69                                      | 237.2                           | 04Aug2013, 18:10    | 169.6                     |
| FSUT1-2D                  | 0.18                                      | 179.6                           | 04Aug2013, 14:35    | 55.4                      |
| FSUT1-2C                  | 0.11                                      | 231.6                           | 04Aug2013, 13:25    | 30.9                      |
| RT FSUT1-2C               | 0.11                                      | 180.4                           | 04Aug2013, 13:35    | 30.5                      |
| ADD FSUT1-2D              | 0.98                                      | 325.9                           | 04Aug2013, 14:15    | 255.6                     |
| RT-FSUT1-2D               | 0.98                                      | 323.6                           | 04Aug2013, 14:40    | 252.6                     |
| FSUT1-2E                  | 0.17                                      | 454.8                           | 04Aug2013, 13:15    | 55.3                      |
| ADD FSUT1-2E              | 1.15                                      | 598.4                           | 04Aug2013, 13:20    | 307.9                     |
| RT FSUT1-2E               | 1.15                                      | 558.2                           | 04Aug2013, 13:25    | 306.7                     |
| FSUT1-2F                  | 0.11                                      | 101                             | 04Aug2013, 14:45    | 33.5                      |
| ADD FSUT1-2F              | 1.26                                      | 590.9                           | 04Aug2013, 13:25    | 340.2                     |
| RT FSUT1-2F               | 1.26                                      | 576.3                           | 04Aug2013, 13:25    | 339.7                     |
| FSUT1-1A                  | 0.40                                      | 149.8                           | 04Aug2013, 19:35    | 100.2                     |
| FSUT1-1B                  | 0.39                                      | 184.3                           | 04Aug2013, 18:05    | 113.7                     |
| RT FSUT1-1A-1B            | 0.80                                      | 324.6                           | 04Aug2013, 18:50    | 209.6                     |
| FSUT1-1C                  | 0.27                                      | 189.9                           | 04Aug2013, 15:40    | 81.8                      |
| U/S Limit FSUT1           | 1.07                                      | 411.6                           | 04Aug2013, 17:55    | 291.5                     |
| FSUT1-2G                  | 0.09                                      | 155.1                           | 04Aug2013, 13:50    | 31.6                      |
| Trafalgar Drive           | 1.16                                      | 425.3                           | 04Aug2013, 17:45    | 319.3                     |
| Corey Road - FSUT1        | 2.41                                      | 784.9                           | 04Aug2013, 17:05    | 657.6                     |
| FSUT1-3                   | 0.19                                      | 158.7                           | 04Aug2013, 14:40    | 48.8                      |
| ADD FSUT1-3               | 2.60                                      | 920.3                           | 04Aug2013, 14:55    | 706.4                     |
| RT FSUT1                  | 2.60                                      | 920.3                           | 04Aug2013, 21:15    | 439.6                     |
| FS-10C                    | 0.10                                      | 89.9                            | 04Aug2013, 14:45    | 29.2                      |
| ADD FSUT1                 | 10.05                                     | 3502.1                          | 04Aug2013, 20:45    | 2615                      |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 50-YEAR FUTURE     |                                     |                         |                  |                   |
|--------------------|-------------------------------------|-------------------------|------------------|-------------------|
| Hydrologic Element | Drainage Area<br>(mi <sup>2</sup> ) | Peak Discharge<br>(CFS) | Time of Peak     | Volume<br>(AC-FT) |
| RT FS-10           | 10.05                               | 3494.2                  | 04Aug2013, 20:50 | 2603.9            |
| FS-10D             | 0.18                                | 168.7                   | 04Aug2013, 14:50 | 56.1              |
| FS-10B             | 0.15                                | 175.1                   | 04Aug2013, 14:05 | 41.3              |
| FS-10A             | 0.03                                | 43.9                    | 04Aug2013, 14:10 | 11                |
| RT FS-10A          | 0.03                                | 43.5                    | 04Aug2013, 14:30 | 10.9              |
| ADD FS-10B-10C-10D | 10.42                               | 3527.2                  | 04Aug2013, 20:45 | 2712.1            |
| RT FS-10B-10D      | 10.42                               | 3522.6                  | 04Aug2013, 20:50 | 2704.7            |
| FS-10F             | 0.15                                | 233.1                   | 04Aug2013, 13:40 | 40.7              |
| FS-10E             | 0.07                                | 122.6                   | 04Aug2013, 13:35 | 19.5              |
| ADD FS-10E-10F     | 10.64                               | 3537.8                  | 04Aug2013, 20:50 | 2765              |
| RT FS-10E-10F      | 10.64                               | 3524.3                  | 04Aug2013, 20:55 | 2747.7            |
| OUTLET             | 10.64                               | 3524.3                  | 04Aug2013, 20:55 | 2747.7            |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR FUTURE</b>       |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 116                             | 04Aug2013, 15:05    | 44.2                      |
| FSUT3-1B                     | 0.10                                      | 169.8                           | 04Aug2013, 13:55    | 36.4                      |
| FSUT3-1C                     | 0.09                                      | 99.6                            | 04Aug2013, 14:35    | 30.7                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 323.3                           | 04Aug2013, 14:10    | 111.3                     |
| FSUT3-1D                     | 0.17                                      | 152.7                           | 04Aug2013, 15:40    | 66.8                      |
| RT FSUT3-1D                  | 0.17                                      | 152.7                           | 04Aug2013, 15:40    | 66.8                      |
| FSUT3-1E                     | 0.04                                      | 97.3                            | 04Aug2013, 13:25    | 13.1                      |
| U/S Limit FSUT3              | 0.49                                      | 438.2                           | 04Aug2013, 14:30    | 191.2                     |
| RT FSUT3-1E                  | 0.49                                      | 437.1                           | 04Aug2013, 14:40    | 190.6                     |
| FSUT3-2A                     | 0.08                                      | 73.9                            | 04Aug2013, 15:10    | 27.4                      |
| ADD FSUT3-2A                 | 0.58                                      | 506.5                           | 04Aug2013, 14:50    | 218                       |
| RT FSUT3-2A                  | 0.58                                      | 505.9                           | 04Aug2013, 14:50    | 217.6                     |
| FSUT3-2B                     | 0.11                                      | 100.3                           | 04Aug2013, 15:10    | 37.3                      |
| ADD FSUT3-2B                 | 0.69                                      | 604.3                           | 04Aug2013, 15:00    | 254.9                     |
| RT FSUT3-2B                  | 0.69                                      | 601.3                           | 04Aug2013, 15:05    | 254                       |
| FSUT3-3                      | 0.09                                      | 287.9                           | 04Aug2013, 13:15    | 35.1                      |
| ADD FSUT3-3                  | 0.78                                      | 631.7                           | 04Aug2013, 15:00    | 289.1                     |
| Coleman Drive                | 0.78                                      | 631.7                           | 04Aug2013, 15:00    | 289.1                     |
| FSUT3-5                      | 0.16                                      | 214.5                           | 04Aug2013, 14:35    | 68.2                      |
| Country Home Road            | 0.16                                      | 213                             | 04Aug2013, 14:40    | 68.2                      |
| RT FSUT3-5                   | 0.16                                      | 213                             | 04Aug2013, 14:40    | 68.2                      |
| FSUT3-6                      | 0.11                                      | 151.7                           | 04Aug2013, 14:35    | 48.7                      |
| ADD FSUT3-6                  | 0.27                                      | 363.9                           | 04Aug2013, 14:40    | 116.8                     |
| East Fire Tower Road - North | 0.27                                      | 316.1                           | 04Aug2013, 15:10    | 116.8                     |
| FSUT3-4C                     | 0.13                                      | 105.6                           | 04Aug2013, 16:10    | 51.7                      |
| FSUT3-4B                     | 0.07                                      | 135.1                           | 04Aug2013, 13:55    | 30                        |
| FSUT3-4A                     | 0.07                                      | 53                              | 04Aug2013, 16:15    | 25.9                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 192.3                           | 04Aug2013, 14:00    | 107.6                     |
| RT FSUT3-4C                  | 0.27                                      | 191.7                           | 04Aug2013, 14:10    | 107.2                     |
| FSUT3-4D                     | 0.08                                      | 288.7                           | 04Aug2013, 13:15    | 36                        |
| ADD FSUT3-4D                 | 0.62                                      | 519.7                           | 04Aug2013, 15:10    | 260                       |
| Wimbledon Drive              | 0.62                                      | 519.4                           | 04Aug2013, 15:15    | 259.6                     |
| FSUT3-7                      | 0.14                                      | 115.5                           | 04Aug2013, 16:10    | 56.7                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 623                             | 04Aug2013, 15:30    | 316.2                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 1242.3                          | 04Aug2013, 15:15    | 605.3                     |
| FSUT3-8                      | 0.08                                      | 153.8                           | 04Aug2013, 13:45    | 28.9                      |
| East Fire Tower - South      | 1.62                                      | 1278.2                          | 04Aug2013, 15:15    | 634                       |
| FSUT3-9B                     | 0.16                                      | 104.1                           | 04Aug2013, 17:20    | 59.9                      |
| FSUT3-9A                     | 0.05                                      | 89.5                            | 04Aug2013, 14:05    | 21.8                      |
| RT FSUT3-9A                  | 0.05                                      | 87.6                            | 04Aug2013, 14:15    | 21.6                      |
| ADD FSUT3-9B                 | 0.22                                      | 123.6                           | 04Aug2013, 14:25    | 81.5                      |
| Corey Road - FSUT3           | 0.22                                      | 123.6                           | 04Aug2013, 14:25    | 81.5                      |
| FSUT3-9C                     | 0.16                                      | 138.9                           | 04Aug2013, 15:40    | 60.2                      |
| ADD FSUT3-9C                 | 1.99                                      | 1524.5                          | 04Aug2013, 15:15    | 775.7                     |
| RT FSUT 3-9C                 | 1.99                                      | 1522.1                          | 04Aug2013, 15:20    | 774.2                     |
| FSUT3-9D                     | 0.09                                      | 297                             | 04Aug2013, 13:15    | 36.8                      |
| ADD FSUT3-9D                 | 2.08                                      | 1548.8                          | 04Aug2013, 15:15    | 811.1                     |
| RT FSUT3-9D                  | 2.08                                      | 1546                            | 04Aug2013, 15:25    | 808.7                     |
| FSUT3-10A                    | 0.24                                      | 165.3                           | 04Aug2013, 16:45    | 88                        |
| ADD FSUT3-10A                | 2.32                                      | 1678.5                          | 04Aug2013, 15:30    | 896.6                     |
| RT FSUT3-10A                 | 2.32                                      | 1676.7                          | 04Aug2013, 15:35    | 894.9                     |
| FSUT3-10C                    | 0.22                                      | 170.8                           | 04Aug2013, 15:45    | 73.4                      |
| FSUT3-10B                    | 0.09                                      | 299.5                           | 04Aug2013, 13:15    | 37.3                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 1871.8                          | 04Aug2013, 15:35    | 1005.6                    |
| RT FSUT3                     | 2.63                                      | 1871.8                          | 04Aug2013, 21:05    | 847.9                     |
| FS-1B                        | 0.13                                      | 170.5                           | 04Aug2013, 14:35    | 53.8                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR FUTURE</b>     |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FS-1A                      | 0.12                                      | 165.7                           | 04Aug2013, 14:35    | 53.2                      |
| RT FS-1A                   | 0.12                                      | 165.5                           | 04Aug2013, 14:35    | 53.1                      |
| ADD FS-1B                  | 0.25                                      | 336                             | 04Aug2013, 14:35    | 106.9                     |
| RT FS-1B                   | 0.25                                      | 334.2                           | 04Aug2013, 14:40    | 106.7                     |
| FS-2A                      | 0.16                                      | 193.1                           | 04Aug2013, 14:35    | 60                        |
| RT FS-2A                   | 0.16                                      | 192.3                           | 04Aug2013, 14:40    | 59.9                      |
| FS-2B                      | 0.08                                      | 211.3                           | 04Aug2013, 13:25    | 32.4                      |
| ADD FS-2B                  | 0.23                                      | 282.7                           | 04Aug2013, 13:30    | 92.3                      |
| RT FS-2B                   | 0.23                                      | 279.4                           | 04Aug2013, 13:35    | 92.2                      |
| ADD FS1-2                  | 0.48                                      | 567                             | 04Aug2013, 14:35    | 198.8                     |
| FS-3                       | 0.08                                      | 139.5                           | 04Aug2013, 14:05    | 33.7                      |
| East Baywood Lane          | 0.56                                      | 680.5                           | 04Aug2013, 14:30    | 232.3                     |
| U/S Limit FS               | 0.56                                      | 680.5                           | 04Aug2013, 14:30    | 232.3                     |
| FS-4B                      | 0.12                                      | 206                             | 04Aug2013, 14:05    | 50.5                      |
| FS-4A                      | 0.10                                      | 90                              | 04Aug2013, 15:40    | 39.2                      |
| RT FS-4A                   | 0.10                                      | 89.8                            | 04Aug2013, 15:45    | 39.2                      |
| ADD FS-4B                  | 0.22                                      | 248                             | 04Aug2013, 14:10    | 89.7                      |
| RT FS-4B                   | 0.22                                      | 239.9                           | 04Aug2013, 14:15    | 89.3                      |
| Railroad                   | 0.78                                      | 915.6                           | 04Aug2013, 14:25    | 321.5                     |
| FS-5                       | 0.05                                      | 185.1                           | 04Aug2013, 13:15    | 23.7                      |
| Evans Street               | 0.83                                      | 939                             | 04Aug2013, 14:30    | 344.8                     |
| FS-6A                      | 0.16                                      | 155.7                           | 04Aug2013, 15:40    | 68.8                      |
| FS-6B                      | 0.09                                      | 248.9                           | 04Aug2013, 13:25    | 33.8                      |
| RT FS-6A-6B                | 0.25                                      | 284.8                           | 04Aug2013, 13:30    | 102.3                     |
| FS-6E                      | 0.11                                      | 92.6                            | 04Aug2013, 15:40    | 40.1                      |
| FS-6D                      | 0.10                                      | 100.7                           | 04Aug2013, 15:10    | 37.8                      |
| ADD FS-6D-6E               | 0.20                                      | 189.9                           | 04Aug2013, 15:20    | 77.9                      |
| FS-6C                      | 0.15                                      | 195.1                           | 04Aug2013, 14:35    | 61.1                      |
| ADD FS-6C                  | 1.44                                      | 1444.3                          | 04Aug2013, 14:35    | 586.1                     |
| FS-6F                      | 0.17                                      | 106.3                           | 04Aug2013, 17:20    | 61.3                      |
| ADD FS-6F                  | 1.60                                      | 1490.2                          | 04Aug2013, 14:40    | 647.4                     |
| RT FS-6F                   | 1.60                                      | 1476.8                          | 04Aug2013, 14:45    | 645.2                     |
| FS-7A                      | 0.15                                      | 488.6                           | 04Aug2013, 13:15    | 60.1                      |
| ADD FS-7A                  | 1.75                                      | 1534                            | 04Aug2013, 14:40    | 705.4                     |
| RT FS-7A                   | 1.75                                      | 1532.7                          | 04Aug2013, 14:45    | 704.6                     |
| FS-7B                      | 0.15                                      | 187.9                           | 04Aug2013, 14:35    | 58.4                      |
| ADD FS-7B                  | 1.90                                      | 1718.2                          | 04Aug2013, 14:45    | 763                       |
| E Fire Tower Road (Bridge) | 1.90                                      | 1718.2                          | 04Aug2013, 14:45    | 763                       |
| RT FS-7B                   | 1.90                                      | 1709.2                          | 04Aug2013, 14:45    | 760.9                     |
| FS-8E                      | 0.12                                      | 241.3                           | 04Aug2013, 13:40    | 41.3                      |
| ADD FS8-E                  | 2.03                                      | 1776.7                          | 04Aug2013, 14:40    | 802.2                     |
| RT FS-8E                   | 2.03                                      | 1775.9                          | 04Aug2013, 14:45    | 801.5                     |
| FS-8B                      | 0.13                                      | 127.2                           | 04Aug2013, 15:00    | 44.7                      |
| FS-8C                      | 0.09                                      | 229.9                           | 04Aug2013, 13:35    | 37.7                      |
| FS-8A                      | 0.06                                      | 47.6                            | 04Aug2013, 16:15    | 23                        |
| ADD FS-8A-8B-8C            | 0.28                                      | 287.9                           | 04Aug2013, 13:35    | 105.5                     |
| RT FS-8C                   | 0.28                                      | 285.6                           | 04Aug2013, 13:40    | 105.3                     |
| FS-8D                      | 0.07                                      | 202.3                           | 04Aug2013, 13:15    | 24.5                      |
| ADD FS-8D                  | 2.38                                      | 2011                            | 04Aug2013, 13:45    | 931.2                     |
| ADD FSUT3 to FS            | 5.01                                      | 2211                            | 04Aug2013, 20:55    | 1779.1                    |
| FS-9                       | 0.14                                      | 200.7                           | 04Aug2013, 14:05    | 47.6                      |
| ADD FS-9                   | 5.15                                      | 2223.4                          | 04Aug2013, 20:55    | 1826.7                    |
| RT FS-9                    | 5.15                                      | 2221.6                          | 04Aug2013, 20:55    | 1821.7                    |
| FSUT2-3                    | 0.21                                      | 131.7                           | 04Aug2013, 17:20    | 75.5                      |
| FSUT2-1                    | 0.14                                      | 232.4                           | 04Aug2013, 14:00    | 52.9                      |
| U/S Limit FSUT2-2          | 0.14                                      | 232.4                           | 04Aug2013, 14:00    | 52.9                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR FUTURE</b>    |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 225.1                           | 04Aug2013, 14:05    | 52.7                      |
| FSUT2-2                   | 0.03                                      | 100.3                           | 04Aug2013, 13:15    | 12.3                      |
| ADD FSUT2-2               | 0.17                                      | 246.6                           | 04Aug2013, 14:00    | 65                        |
| RT FSUT2-2                | 0.17                                      | 245.4                           | 04Aug2013, 14:05    | 64.9                      |
| ADD FSUT2-3               | 0.38                                      | 280.9                           | 04Aug2013, 14:05    | 140.4                     |
| RT FSUT2-3                | 0.38                                      | 280.6                           | 04Aug2013, 14:10    | 140.3                     |
| FSUT2-4                   | 0.14                                      | 133.7                           | 04Aug2013, 15:40    | 59.8                      |
| ADD FSUT2-4               | 0.52                                      | 359.4                           | 04Aug2013, 14:20    | 200                       |
| RT FSUT2-4                | 0.52                                      | 358.1                           | 04Aug2013, 14:25    | 199.5                     |
| FSUT2-5                   | 0.21                                      | 161.6                           | 04Aug2013, 16:45    | 87.8                      |
| West Fire Tower Rd        | 0.73                                      | 464.7                           | 04Aug2013, 16:10    | 286.9                     |
| D/S Limit FSUT2-2         | 0.73                                      | 464.7                           | 04Aug2013, 16:10    | 286.9                     |
| FSUT2-6                   | 0.31                                      | 215.4                           | 04Aug2013, 17:15    | 126                       |
| ADD FSUT2-6               | 1.05                                      | 668.4                           | 04Aug2013, 16:35    | 412.9                     |
| RT FSUT2-6                | 1.05                                      | 667.7                           | 04Aug2013, 16:40    | 410.9                     |
| FSUT2-7A                  | 0.19                                      | 131.5                           | 04Aug2013, 16:45    | 70                        |
| ADD FSUT2-7A              | 1.24                                      | 799.1                           | 04Aug2013, 16:45    | 480.9                     |
| RT FSUT2-7A               | 1.24                                      | 798.2                           | 04Aug2013, 16:50    | 479.1                     |
| FSUT2-7B                  | 0.42                                      | 214.7                           | 04Aug2013, 18:30    | 136.3                     |
| ADD FSUT2-7B              | 1.66                                      | 985.1                           | 04Aug2013, 17:05    | 615.4                     |
| FSUT2-8A                  | 0.27                                      | 236.6                           | 04Aug2013, 15:40    | 102.5                     |
| FSUT2-8B                  | 0.06                                      | 189.1                           | 04Aug2013, 13:15    | 23.3                      |
| U/S Limit FSUT2-1         | 1.99                                      | 1184.7                          | 04Aug2013, 16:40    | 741.2                     |
| RT FSUT2-8A-8B            | 1.99                                      | 1184                            | 04Aug2013, 16:45    | 739.1                     |
| FSUT2-9B                  | 0.11                                      | 154.7                           | 04Aug2013, 14:20    | 42.6                      |
| FSUT2-9A                  | 0.10                                      | 305.1                           | 04Aug2013, 13:15    | 37.1                      |
| ADD FSUT2-9A-9B           | 2.20                                      | 1246.4                          | 04Aug2013, 16:35    | 818.9                     |
| RT FSUT2-9A-9B            | 2.20                                      | 1246.4                          | 04Aug2013, 18:05    | 785.1                     |
| ADD FSUT2                 | 7.35                                      | 3187.4                          | 04Aug2013, 19:15    | 2606.7                    |
| FSUT1-2A                  | 0.45                                      | 177.9                           | 04Aug2013, 20:20    | 120.7                     |
| FSUT1-2B                  | 0.24                                      | 162                             | 04Aug2013, 16:55    | 87.5                      |
| ADD FSUT1-2A-2B           | 0.69                                      | 290.2                           | 04Aug2013, 18:05    | 208.3                     |
| FSUT1-2D                  | 0.18                                      | 217.9                           | 04Aug2013, 14:35    | 67.5                      |
| FSUT1-2C                  | 0.11                                      | 285.2                           | 04Aug2013, 13:25    | 38.3                      |
| RT FSUT1-2C               | 0.11                                      | 224.7                           | 04Aug2013, 13:35    | 37.8                      |
| ADD FSUT1-2D              | 0.98                                      | 398.7                           | 04Aug2013, 14:10    | 313.6                     |
| RT-FSUT1-2D               | 0.98                                      | 395.7                           | 04Aug2013, 14:40    | 310.2                     |
| FSUT1-2E                  | 0.17                                      | 548.9                           | 04Aug2013, 13:15    | 67.1                      |
| ADD FSUT1-2E              | 1.15                                      | 742.8                           | 04Aug2013, 13:20    | 377.3                     |
| RT FSUT1-2E               | 1.15                                      | 693.1                           | 04Aug2013, 13:25    | 376                       |
| FSUT1-2F                  | 0.11                                      | 122.2                           | 04Aug2013, 14:45    | 40.7                      |
| ADD FSUT1-2F              | 1.26                                      | 734                             | 04Aug2013, 13:25    | 416.7                     |
| RT FSUT1-2F               | 1.26                                      | 717.3                           | 04Aug2013, 13:25    | 416                       |
| FSUT1-1A                  | 0.40                                      | 182.3                           | 04Aug2013, 19:35    | 122.6                     |
| FSUT1-1B                  | 0.39                                      | 222.8                           | 04Aug2013, 18:05    | 138.2                     |
| RT FSUT1-1A-1B            | 0.80                                      | 393.9                           | 04Aug2013, 18:50    | 256                       |
| FSUT1-1C                  | 0.27                                      | 230.6                           | 04Aug2013, 15:40    | 99.7                      |
| U/S Limit FSUT1           | 1.07                                      | 500.2                           | 04Aug2013, 17:45    | 355.7                     |
| FSUT1-2G                  | 0.09                                      | 185                             | 04Aug2013, 13:50    | 38                        |
| Trafalgar Drive           | 1.16                                      | 517                             | 04Aug2013, 17:35    | 388.7                     |
| Corey Road - FSUT1        | 2.41                                      | 962.7                           | 04Aug2013, 16:35    | 803                       |
| FSUT1-3                   | 0.19                                      | 197.7                           | 04Aug2013, 14:40    | 60.8                      |
| ADD FSUT1-3               | 2.60                                      | 1121.6                          | 04Aug2013, 14:45    | 863.8                     |
| RT FSUT1                  | 2.60                                      | 1121.6                          | 04Aug2013, 21:05    | 545                       |
| FS-10C                    | 0.10                                      | 110.5                           | 04Aug2013, 14:45    | 35.9                      |
| ADD FSUT1                 | 10.05                                     | 4237                            | 04Aug2013, 20:40    | 3187.7                    |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR FUTURE</b>    |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FS-10                  | 10.05                                     | 4227.4                          | 04Aug2013, 20:45    | 3174.9                    |
| FS-10D                    | 0.18                                      | 204.6                           | 04Aug2013, 14:45    | 68.3                      |
| FS-10B                    | 0.15                                      | 217.2                           | 04Aug2013, 14:05    | 51.3                      |
| FS-10A                    | 0.03                                      | 52.9                            | 04Aug2013, 14:10    | 13.3                      |
| RT FS-10A                 | 0.03                                      | 52.4                            | 04Aug2013, 14:25    | 13.2                      |
| ADD FS-10B-10C-10D        | 10.42                                     | 4267.1                          | 04Aug2013, 20:40    | 3307.6                    |
| RT FS-10B-10D             | 10.42                                     | 4261.8                          | 04Aug2013, 20:45    | 3299.1                    |
| FS-10F                    | 0.15                                      | 289.8                           | 04Aug2013, 13:40    | 50.7                      |
| FS-10E                    | 0.07                                      | 149.5                           | 04Aug2013, 13:35    | 23.9                      |
| ADD FS-10E-10F            | 10.64                                     | 4280.1                          | 04Aug2013, 20:45    | 3373.8                    |
| RT FS-10E-10F             | 10.64                                     | 4261.8                          | 04Aug2013, 20:45    | 3353.8                    |
| OUTLET                    | 10.64                                     | 4261.8                          | 04Aug2013, 20:45    | 3353.8                    |

**PRIMARY SYSTEM  
ALTERNATIVE CONDITIONS:  
HEC-HMS OUTPUT**

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR ALTERNATIVE</b>    |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 34                              | 04Aug2013, 15:10    | 12.6                      |
| FSUT3-1B                     | 0.10                                      | 41.5                            | 04Aug2013, 13:55    | 8.9                       |
| FSUT3-1C                     | 0.09                                      | 19.8                            | 04Aug2013, 14:45    | 6.4                       |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 77.7                            | 04Aug2013, 14:20    | 27.9                      |
| FSUT3-1D                     | 0.17                                      | 42.3                            | 04Aug2013, 15:45    | 18.2                      |
| RT FSUT3-1D                  | 0.17                                      | 42.3                            | 04Aug2013, 15:45    | 18.2                      |
| FSUT3-1E                     | 0.04                                      | 19.9                            | 04Aug2013, 13:25    | 2.7                       |
| U/S Limit FSUT3              | 0.49                                      | 111.6                           | 04Aug2013, 14:55    | 48.8                      |
| RT FSUT3-1E                  | 0.49                                      | 111.2                           | 04Aug2013, 15:05    | 48.5                      |
| FSUT3-2A                     | 0.08                                      | 14.1                            | 04Aug2013, 15:20    | 5.5                       |
| ADD FSUT3-2A                 | 0.58                                      | 125                             | 04Aug2013, 15:10    | 54                        |
| RT FSUT3-2A                  | 0.58                                      | 124.9                           | 04Aug2013, 15:10    | 53.9                      |
| FSUT3-2B                     | 0.11                                      | 19.9                            | 04Aug2013, 15:20    | 7.7                       |
| ADD FSUT3-2B                 | 0.69                                      | 144.7                           | 04Aug2013, 15:15    | 61.6                      |
| RT FSUT3-2B                  | 0.69                                      | 143.8                           | 04Aug2013, 15:20    | 61.2                      |
| FSUT3-3                      | 0.09                                      | 71.4                            | 04Aug2013, 13:20    | 8.6                       |
| ADD FSUT3-3                  | 0.78                                      | 151.9                           | 04Aug2013, 15:20    | 69.8                      |
| Coleman Drive                | 0.78                                      | 151.8                           | 04Aug2013, 15:20    | 69.8                      |
| FSUT3-5                      | 0.16                                      | 64.7                            | 04Aug2013, 14:35    | 19.9                      |
| Country Home Road            | 0.16                                      | 64.7                            | 04Aug2013, 14:40    | 19.9                      |
| RT FSUT3-5                   | 0.16                                      | 64.7                            | 04Aug2013, 14:40    | 19.9                      |
| FSUT3-6                      | 0.11                                      | 48.1                            | 04Aug2013, 14:35    | 14.8                      |
| ADD FSUT3-6                  | 0.27                                      | 112.8                           | 04Aug2013, 14:35    | 34.7                      |
| East Fire Tower Road - North | 0.27                                      | 112.8                           | 04Aug2013, 14:40    | 34.7                      |
| FSUT3-4C                     | 0.13                                      | 28.4                            | 04Aug2013, 16:20    | 13.7                      |
| FSUT3-4B                     | 0.07                                      | 42.3                            | 04Aug2013, 13:55    | 9                         |
| FSUT3-4A                     | 0.07                                      | 13.9                            | 04Aug2013, 16:20    | 6.7                       |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 53.5                            | 04Aug2013, 14:00    | 29.4                      |
| RT FSUT3-4C                  | 0.27                                      | 53.3                            | 04Aug2013, 14:10    | 29.2                      |
| FSUT3-4D                     | 0.08                                      | 83.9                            | 04Aug2013, 13:20    | 10.1                      |
| ADD FSUT3-4D                 | 0.62                                      | 174.2                           | 04Aug2013, 14:30    | 74                        |
| Wimbledon Drive              | 0.62                                      | 173.8                           | 04Aug2013, 14:35    | 74                        |
| FSUT3-7                      | 0.14                                      | 31.9                            | 04Aug2013, 16:20    | 15.4                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 191.5                           | 04Aug2013, 14:45    | 89.4                      |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 337.8                           | 04Aug2013, 15:00    | 159.2                     |
| FSUT3-8                      | 0.08                                      | 35.5                            | 04Aug2013, 13:45    | 6.7                       |
| East Fire Tower - South      | 1.62                                      | 349.4                           | 04Aug2013, 15:00    | 165.8                     |
| FSUT3-9B                     | 0.16                                      | 26.4                            | 04Aug2013, 17:30    | 15                        |
| FSUT3-9A                     | 0.05                                      | 25.2                            | 04Aug2013, 14:05    | 6                         |
| RT FSUT3-9A                  | 0.05                                      | 24.7                            | 04Aug2013, 14:25    | 5.9                       |
| ADD FSUT3-9B                 | 0.22                                      | 31.9                            | 04Aug2013, 14:35    | 20.9                      |
| Corey Road - FSUT3           | 0.22                                      | 31.9                            | 04Aug2013, 14:35    | 20.9                      |
| FSUT3-9C                     | 0.16                                      | 34.4                            | 04Aug2013, 15:50    | 14.9                      |
| ADD FSUT3-9C                 | 1.99                                      | 408.9                           | 04Aug2013, 15:05    | 201.6                     |
| RT FSUT 3-9C                 | 1.99                                      | 407.9                           | 04Aug2013, 15:10    | 201.1                     |
| FSUT3-9D                     | 0.09                                      | 84.2                            | 04Aug2013, 13:20    | 10.1                      |
| ADD FSUT3-9D                 | 2.08                                      | 417.4                           | 04Aug2013, 15:05    | 211.2                     |
| RT FSUT3-9D                  | 2.08                                      | 416.1                           | 04Aug2013, 15:15    | 210                       |
| FSUT3-10A                    | 0.24                                      | 39.7                            | 04Aug2013, 17:00    | 21.1                      |
| ADD FSUT3-10A                | 2.32                                      | 442.2                           | 04Aug2013, 15:20    | 231.1                     |
| RT FSUT3-10A                 | 2.32                                      | 441.6                           | 04Aug2013, 15:25    | 230.4                     |
| FSUT3-10C                    | 0.22                                      | 35.1                            | 04Aug2013, 15:55    | 15.6                      |
| FSUT3-10B                    | 0.09                                      | 87                              | 04Aug2013, 13:20    | 10.5                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 483.6                           | 04Aug2013, 15:30    | 256.5                     |
| RT FSUT3                     | 2.63                                      | 483.6                           | 04Aug2013, 21:00    | 207.8                     |
| FS-1B                        | 0.13                                      | 48.9                            | 04Aug2013, 14:40    | 15                        |



City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 2-YEAR ALTERNATIVE         |                                  |                      |                  |                |
|----------------------------|----------------------------------|----------------------|------------------|----------------|
| Hydrologic Element         | Drainage Area (mi <sup>2</sup> ) | Peak Discharge (CFS) | Time of Peak     | Volume (AC-FT) |
| FS-1A                      | 0.12                             | 52.6                 | 04Aug2013, 14:35 | 16.2           |
| RT FS-1A                   | 0.12                             | 52.5                 | 04Aug2013, 14:40 | 16.2           |
| ADD FS-1B                  | 0.25                             | 101.4                | 04Aug2013, 14:40 | 31.2           |
| RT FS-1B                   | 0.25                             | 100.8                | 04Aug2013, 14:45 | 31.1           |
| FS-2A                      | 0.16                             | 48.2                 | 04Aug2013, 14:40 | 14.9           |
| RT FS-2A                   | 0.16                             | 48                   | 04Aug2013, 14:45 | 14.9           |
| FS-2B                      | 0.08                             | 62                   | 04Aug2013, 13:30 | 9.1            |
| ADD FS-2B                  | 0.23                             | 74                   | 04Aug2013, 13:30 | 24             |
| RT FS-2B                   | 0.23                             | 73.1                 | 04Aug2013, 13:35 | 23.9           |
| ADD FS1-2                  | 0.48                             | 160.9                | 04Aug2013, 14:45 | 55.1           |
| FS-3                       | 0.08                             | 37.1                 | 04Aug2013, 14:05 | 8.8            |
| East Baywood Lane          | 0.56                             | 188                  | 04Aug2013, 14:40 | 63.8           |
| U/S Limit FS               | 0.56                             | 188                  | 04Aug2013, 14:40 | 63.8           |
| FS-4B                      | 0.12                             | 61.1                 | 04Aug2013, 14:05 | 14.5           |
| FS-4A                      | 0.10                             | 24.2                 | 04Aug2013, 15:45 | 10.4           |
| RT FS-4A                   | 0.10                             | 24.2                 | 04Aug2013, 15:55 | 10.4           |
| ADD FS-4B                  | 0.22                             | 70                   | 04Aug2013, 14:10 | 24.9           |
| RT FS-4B                   | 0.22                             | 67.6                 | 04Aug2013, 14:20 | 24.7           |
| Railroad                   | 0.78                             | 250.5                | 04Aug2013, 14:45 | 88.4           |
| FS-5                       | 0.05                             | 60.8                 | 04Aug2013, 13:15 | 7.4            |
| Evans Street               | 0.83                             | 257.6                | 04Aug2013, 14:45 | 95.7           |
| FS-6A                      | 0.16                             | 46.6                 | 04Aug2013, 15:45 | 20             |
| FS-6B                      | 0.09                             | 58.4                 | 04Aug2013, 13:25 | 7.9            |
| RT FS-6A-6B                | 0.25                             | 65.7                 | 04Aug2013, 13:35 | 27.8           |
| FS-6E                      | 0.11                             | 22.9                 | 04Aug2013, 15:50 | 9.9            |
| FS-6D                      | 0.10                             | 25                   | 04Aug2013, 15:15 | 9.4            |
| ADD FS-6D-6E               | 0.20                             | 47                   | 04Aug2013, 15:30 | 19.3           |
| FS-6C                      | 0.15                             | 53                   | 04Aug2013, 14:40 | 16.3           |
| ADD FS-6C                  | 1.44                             | 397                  | 04Aug2013, 14:50 | 159.1          |
| FS-6F                      | 0.17                             | 27.8                 | 04Aug2013, 17:30 | 15.7           |
| ADD FS-6F                  | 1.60                             | 408.4                | 04Aug2013, 14:55 | 174.9          |
| RT FS-6F                   | 1.60                             | 403.5                | 04Aug2013, 15:00 | 173.9          |
| FS-7A                      | 0.15                             | 131.6                | 04Aug2013, 13:20 | 15.8           |
| ADD FS-7A                  | 1.75                             | 419.6                | 04Aug2013, 15:00 | 189.7          |
| RT FS-7A                   | 1.75                             | 419                  | 04Aug2013, 15:05 | 189.3          |
| FS-7B                      | 0.15                             | 46.9                 | 04Aug2013, 14:40 | 14.5           |
| ADD FS-7B                  | 1.90                             | 463.6                | 04Aug2013, 15:00 | 203.9          |
| E Fire Tower Road (Bridge) | 1.90                             | 463.6                | 04Aug2013, 15:00 | 203.9          |
| RT FS-7B                   | 1.90                             | 460.3                | 04Aug2013, 15:05 | 203.1          |
| FS-8E                      | 0.12                             | 47                   | 04Aug2013, 13:40 | 8.4            |
| ADD FS8-E                  | 2.03                             | 473.1                | 04Aug2013, 15:05 | 211.5          |
| RT FS-8E                   | 2.03                             | 472.5                | 04Aug2013, 15:05 | 211.2          |
| FS-8B                      | 0.13                             | 27.9                 | 04Aug2013, 15:05 | 10.1           |
| FS-8C                      | 0.09                             | 60.3                 | 04Aug2013, 13:35 | 9.7            |
| FS-8A                      | 0.06                             | 11.1                 | 04Aug2013, 16:25 | 5.4            |
| ADD FS-8A-8B-8C            | 0.28                             | 68.6                 | 04Aug2013, 13:40 | 25.1           |
| RT FS-8C                   | 0.28                             | 68.4                 | 04Aug2013, 13:45 | 25             |
| FS-8D                      | 0.07                             | 43                   | 04Aug2013, 13:20 | 5.3            |
| ADD FS-8D                  | 2.38                             | 526.4                | 04Aug2013, 15:05 | 241.5          |
| ADD FSUT3 to FS            | 5.01                             | 595.9                | 04Aug2013, 20:45 | 449.3          |
| FS-9                       | 0.14                             | 40.1                 | 04Aug2013, 14:10 | 9.9            |
| ADD FS-9                   | 5.15                             | 599.5                | 04Aug2013, 20:45 | 459.3          |
| RT FS-9                    | 5.15                             | 598.8                | 04Aug2013, 20:50 | 457.3          |
| FSUT2-3                    | 0.21                             | 31.6                 | 04Aug2013, 17:35 | 18             |
| FSUT2-1                    | 0.14                             | 58.4                 | 04Aug2013, 14:00 | 13.2           |
| U/S Limit FSUT2-2          | 0.14                             | 58.4                 | 04Aug2013, 14:00 | 13.2           |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                | 0.14                                      | 56.2                            | 04Aug2013, 14:10    | 13.1                      |
| FSUT2-2                   | 0.03                                      | 25.6                            | 04Aug2013, 13:20    | 3.1                       |
| ADD FSUT2-2               | 0.17                                      | 61.5                            | 04Aug2013, 14:10    | 16.2                      |
| RT FSUT2-2                | 0.17                                      | 61.1                            | 04Aug2013, 14:10    | 16.2                      |
| ADD FSUT2-3               | 0.38                                      | 67.4                            | 04Aug2013, 14:15    | 34.2                      |
| RT FSUT2-3                | 0.38                                      | 67.2                            | 04Aug2013, 14:20    | 34.1                      |
| FSUT2-4                   | 0.14                                      | 41                              | 04Aug2013, 15:45    | 17.8                      |
| ADD FSUT2-4               | 0.52                                      | 92.8                            | 04Aug2013, 14:35    | 51.9                      |
| RT FSUT2-4                | 0.52                                      | 92.5                            | 04Aug2013, 14:40    | 51.6                      |
| FSUT2-5                   | 0.21                                      | 48.1                            | 04Aug2013, 16:50    | 25.4                      |
| West Fire Tower Rd        | 0.73                                      | 130.9                           | 04Aug2013, 16:20    | 76.9                      |
| D/S Limit FSUT2-2         | 0.73                                      | 130.9                           | 04Aug2013, 16:20    | 76.9                      |
| FSUT2-6                   | 0.31                                      | 64                              | 04Aug2013, 17:25    | 36.4                      |
| ADD FSUT2-6               | 1.05                                      | 191.2                           | 04Aug2013, 16:45    | 113.2                     |
| RT FSUT2-6                | 1.05                                      | 190.9                           | 04Aug2013, 16:55    | 112.4                     |
| FSUT2-7A                  | 0.19                                      | 31.6                            | 04Aug2013, 17:00    | 16.8                      |
| ADD FSUT2-7A              | 1.24                                      | 222.5                           | 04Aug2013, 16:55    | 129.1                     |
| RT FSUT2-7A               | 1.24                                      | 222.1                           | 04Aug2013, 17:00    | 128.3                     |
| FSUT2-7B                  | 0.42                                      | 50.2                            | 04Aug2013, 18:45    | 31.4                      |
| ADD FSUT2-7B              | 1.66                                      | 264.5                           | 04Aug2013, 17:15    | 159.7                     |
| FSUT2-8A                  | 0.27                                      | 58.6                            | 04Aug2013, 15:50    | 25.4                      |
| FSUT2-8B                  | 0.06                                      | 50.9                            | 04Aug2013, 13:20    | 6.1                       |
| U/S Limit FSUT2-1         | 1.99                                      | 313.9                           | 04Aug2013, 16:55    | 191.2                     |
| RT FSUT2-8A-8B            | 1.99                                      | 313.8                           | 04Aug2013, 17:00    | 190.3                     |
| FSUT2-9B                  | 0.11                                      | 37.5                            | 04Aug2013, 14:25    | 10.4                      |
| FSUT2-9A                  | 0.10                                      | 73.5                            | 04Aug2013, 13:20    | 8.9                       |
| ADD FSUT2-9A-9B           | 2.20                                      | 330.1                           | 04Aug2013, 16:50    | 209.5                     |
| RT FSUT2-9A-9B            | 2.20                                      | 330.1                           | 04Aug2013, 18:20    | 198.9                     |
| ADD FSUT2                 | 7.35                                      | 856.7                           | 04Aug2013, 20:30    | 656.2                     |
| FSUT1-2A                  | 0.45                                      | 39.4                            | 04Aug2013, 20:45    | 25.8                      |
| FSUT1-2B                  | 0.24                                      | 40                              | 04Aug2013, 17:05    | 21.5                      |
| ADD FSUT1-2A-2B           | 0.69                                      | 66.9                            | 04Aug2013, 18:20    | 47.3                      |
| FSUT1-2D                  | 0.18                                      | 52.7                            | 04Aug2013, 14:40    | 16.4                      |
| FSUT1-2C                  | 0.11                                      | 58.3                            | 04Aug2013, 13:25    | 8                         |
| RT FSUT1-2C               | 0.11                                      | 42.2                            | 04Aug2013, 13:50    | 7.8                       |
| ADD FSUT1-2D              | 0.98                                      | 91.7                            | 04Aug2013, 14:40    | 71.6                      |
| RT-FSUT1-2D               | 0.98                                      | 91.1                            | 04Aug2013, 15:00    | 70.3                      |
| FSUT1-2E                  | 0.17                                      | 140.1                           | 04Aug2013, 13:20    | 16.8                      |
| ADD FSUT1-2E              | 1.15                                      | 148.9                           | 04Aug2013, 13:20    | 87.1                      |
| RT FSUT1-2E               | 1.15                                      | 134.2                           | 04Aug2013, 13:25    | 86.6                      |
| FSUT1-2F                  | 0.11                                      | 30.4                            | 04Aug2013, 14:50    | 10.1                      |
| ADD FSUT1-2F              | 1.26                                      | 141.4                           | 04Aug2013, 13:25    | 96.7                      |
| RT FSUT1-2F               | 1.26                                      | 140.2                           | 04Aug2013, 14:50    | 96.5                      |
| FSUT1-1A                  | 0.40                                      | 43.8                            | 04Aug2013, 19:50    | 28.7                      |
| FSUT1-1B                  | 0.39                                      | 56.6                            | 04Aug2013, 18:15    | 34.4                      |
| RT FSUT1-1A-1B            | 0.80                                      | 97.4                            | 04Aug2013, 19:20    | 61.2                      |
| FSUT1-1C                  | 0.27                                      | 55.5                            | 04Aug2013, 15:50    | 24.1                      |
| U/S Limit FSUT1           | 1.07                                      | 122.5                           | 04Aug2013, 18:30    | 85.3                      |
| FSUT1-2G                  | 0.09                                      | 52.3                            | 04Aug2013, 13:50    | 10.4                      |
| Trafalgar Drive           | 1.16                                      | 126.9                           | 04Aug2013, 18:30    | 94.9                      |
| Corey Road - FSUT1        | 2.41                                      | 230.1                           | 04Aug2013, 17:15    | 191                       |
| FSUT1-3                   | 0.19                                      | 36.4                            | 04Aug2013, 14:45    | 12                        |
| ADD FSUT1-3               | 2.60                                      | 254.2                           | 04Aug2013, 15:10    | 203                       |
| RT FSUT1                  | 2.60                                      | 254.2                           | 04Aug2013, 21:30    | 119.1                     |
| FS-10C                    | 0.10                                      | 23.5                            | 04Aug2013, 14:50    | 7.9                       |
| ADD FSUT1                 | 10.05                                     | 1096.7                          | 04Aug2013, 20:45    | 783.2                     |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>2-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|---------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b> | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FS-10                  | 10.05                                     | 1093.5                          | 04Aug2013, 20:50    | 778.3                     |
| FS-10D                    | 0.18                                      | 49.5                            | 04Aug2013, 14:55    | 16.6                      |
| FS-10B                    | 0.15                                      | 41.8                            | 04Aug2013, 14:10    | 10.4                      |
| FS-10A                    | 0.03                                      | 13.7                            | 04Aug2013, 14:10    | 3.4                       |
| RT FS-10A                 | 0.03                                      | 13.5                            | 04Aug2013, 14:40    | 3.4                       |
| ADD FS-10B-10C-10D        | 10.42                                     | 1105.3                          | 04Aug2013, 20:45    | 808.7                     |
| RT FS-10B-10D             | 10.42                                     | 1103.4                          | 04Aug2013, 20:50    | 805.5                     |
| FS-10F                    | 0.15                                      | 54.1                            | 04Aug2013, 13:45    | 10                        |
| FS-10E                    | 0.07                                      | 33.7                            | 04Aug2013, 13:35    | 5.4                       |
| ADD FS-10E-10F            | 10.64                                     | 1108.5                          | 04Aug2013, 20:50    | 820.9                     |
| RT FS-10E-10F             | 10.64                                     | 1103.2                          | 04Aug2013, 20:55    | 813.5                     |
| OUTLET                    | 10.64                                     | 1103.2                          | 04Aug2013, 20:55    | 813.5                     |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR ALTERNATIVE</b>   |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 61.4                            | 04Aug2013, 15:10    | 23                        |
| FSUT3-1B                     | 0.10                                      | 83.4                            | 04Aug2013, 13:55    | 17.6                      |
| FSUT3-1C                     | 0.09                                      | 44.7                            | 04Aug2013, 14:40    | 13.8                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 157                             | 04Aug2013, 14:15    | 54.4                      |
| FSUT3-1D                     | 0.17                                      | 78.9                            | 04Aug2013, 15:40    | 34                        |
| RT FSUT3-1D                  | 0.17                                      | 78.9                            | 04Aug2013, 15:40    | 34                        |
| FSUT3-1E                     | 0.04                                      | 44.4                            | 04Aug2013, 13:25    | 5.9                       |
| U/S Limit FSUT3              | 0.49                                      | 217.3                           | 04Aug2013, 14:45    | 94.3                      |
| RT FSUT3-1E                  | 0.49                                      | 216.7                           | 04Aug2013, 14:50    | 94                        |
| FSUT3-2A                     | 0.08                                      | 32.6                            | 04Aug2013, 15:15    | 12.2                      |
| ADD FSUT3-2A                 | 0.58                                      | 247.9                           | 04Aug2013, 14:55    | 106.2                     |
| RT FSUT3-2A                  | 0.58                                      | 247.7                           | 04Aug2013, 15:00    | 106                       |
| FSUT3-2B                     | 0.11                                      | 44.9                            | 04Aug2013, 15:15    | 16.8                      |
| ADD FSUT3-2B                 | 0.69                                      | 292.1                           | 04Aug2013, 15:05    | 122.8                     |
| RT FSUT3-2B                  | 0.69                                      | 290.4                           | 04Aug2013, 15:10    | 122.1                     |
| FSUT3-3                      | 0.09                                      | 141.5                           | 04Aug2013, 13:20    | 17                        |
| ADD FSUT3-3                  | 0.78                                      | 305.7                           | 04Aug2013, 15:10    | 139.1                     |
| Coleman Drive                | 0.78                                      | 305.7                           | 04Aug2013, 15:10    | 139.1                     |
| FSUT3-5                      | 0.16                                      | 115.2                           | 04Aug2013, 14:35    | 35.8                      |
| Country Home Road            | 0.16                                      | 115.2                           | 04Aug2013, 14:35    | 35.8                      |
| RT FSUT3-5                   | 0.16                                      | 115.2                           | 04Aug2013, 14:35    | 35.8                      |
| FSUT3-6                      | 0.11                                      | 83.2                            | 04Aug2013, 14:35    | 26                        |
| ADD FSUT3-6                  | 0.27                                      | 198.4                           | 04Aug2013, 14:35    | 61.8                      |
| East Fire Tower Road - North | 0.27                                      | 196.3                           | 04Aug2013, 14:45    | 61.8                      |
| FSUT3-4C                     | 0.13                                      | 53.8                            | 04Aug2013, 16:15    | 26                        |
| FSUT3-4B                     | 0.07                                      | 73.7                            | 04Aug2013, 13:55    | 15.9                      |
| FSUT3-4A                     | 0.07                                      | 26.7                            | 04Aug2013, 16:15    | 12.9                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 99.1                            | 04Aug2013, 14:00    | 54.7                      |
| RT FSUT3-4C                  | 0.27                                      | 98.8                            | 04Aug2013, 14:10    | 54.5                      |
| FSUT3-4D                     | 0.08                                      | 152.6                           | 04Aug2013, 13:15    | 18.5                      |
| ADD FSUT3-4D                 | 0.62                                      | 305.4                           | 04Aug2013, 14:35    | 134.9                     |
| Wimbledon Drive              | 0.62                                      | 305.1                           | 04Aug2013, 14:40    | 134.8                     |
| FSUT3-7                      | 0.14                                      | 59.6                            | 04Aug2013, 16:15    | 28.8                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 341.3                           | 04Aug2013, 15:00    | 163.6                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 646.6                           | 04Aug2013, 15:05    | 302.7                     |
| FSUT3-8                      | 0.08                                      | 73.7                            | 04Aug2013, 13:45    | 13.7                      |
| East Fire Tower - South      | 1.62                                      | 667.2                           | 04Aug2013, 15:05    | 316.3                     |
| FSUT3-9B                     | 0.16                                      | 51.7                            | 04Aug2013, 17:25    | 29.4                      |
| FSUT3-9A                     | 0.05                                      | 46.7                            | 04Aug2013, 14:05    | 11.1                      |
| RT FSUT3-9A                  | 0.05                                      | 45.7                            | 04Aug2013, 14:20    | 11                        |
| ADD FSUT3-9B                 | 0.22                                      | 61.6                            | 04Aug2013, 14:30    | 40.4                      |
| Corey Road - FSUT3           | 0.22                                      | 61.6                            | 04Aug2013, 14:30    | 40.4                      |
| FSUT3-9C                     | 0.16                                      | 68.4                            | 04Aug2013, 15:45    | 29.3                      |
| ADD FSUT3-9C                 | 1.99                                      | 786.6                           | 04Aug2013, 15:10    | 386                       |
| RT FSUT 3-9C                 | 1.99                                      | 784.9                           | 04Aug2013, 15:15    | 385.2                     |
| FSUT3-9D                     | 0.09                                      | 155.2                           | 04Aug2013, 13:15    | 18.8                      |
| ADD FSUT3-9D                 | 2.08                                      | 800.6                           | 04Aug2013, 15:10    | 404                       |
| RT FSUT3-9D                  | 2.08                                      | 798.6                           | 04Aug2013, 15:20    | 402.3                     |
| FSUT3-10A                    | 0.24                                      | 80.2                            | 04Aug2013, 16:55    | 42.3                      |
| ADD FSUT3-10A                | 2.32                                      | 857.4                           | 04Aug2013, 15:25    | 444.5                     |
| RT FSUT3-10A                 | 2.32                                      | 856.5                           | 04Aug2013, 15:30    | 443.5                     |
| FSUT3-10C                    | 0.22                                      | 77.5                            | 04Aug2013, 15:50    | 33.4                      |
| FSUT3-10B                    | 0.09                                      | 158.4                           | 04Aug2013, 13:15    | 19.2                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 946.8                           | 04Aug2013, 15:30    | 496.1                     |
| RT FSUT3                     | 2.63                                      | 946.8                           | 04Aug2013, 21:00    | 411.5                     |
| FS-1B                        | 0.13                                      | 89.5                            | 04Aug2013, 14:35    | 27.7                      |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 10-YEAR ALTERNATIVE        |                                  |                      |                  |                |
|----------------------------|----------------------------------|----------------------|------------------|----------------|
| Hydrologic Element         | Drainage Area (mi <sup>2</sup> ) | Peak Discharge (CFS) | Time of Peak     | Volume (AC-FT) |
| FS-1A                      | 0.12                             | 90.9                 | 04Aug2013, 14:35 | 28.4           |
| RT FS-1A                   | 0.12                             | 90.7                 | 04Aug2013, 14:40 | 28.4           |
| ADD FS-1B                  | 0.25                             | 180.1                | 04Aug2013, 14:35 | 56.1           |
| RT FS-1B                   | 0.25                             | 179.2                | 04Aug2013, 14:45 | 55.9           |
| FS-2A                      | 0.16                             | 95.4                 | 04Aug2013, 14:40 | 29.3           |
| RT FS-2A                   | 0.16                             | 95.1                 | 04Aug2013, 14:40 | 29.3           |
| FS-2B                      | 0.08                             | 112.2                | 04Aug2013, 13:30 | 16.7           |
| ADD FS-2B                  | 0.23                             | 142.4                | 04Aug2013, 13:30 | 46             |
| RT FS-2B                   | 0.23                             | 140.6                | 04Aug2013, 13:35 | 45.9           |
| ADD FS1-2                  | 0.48                             | 296.1                | 04Aug2013, 14:40 | 101.8          |
| FS-3                       | 0.08                             | 71                   | 04Aug2013, 14:05 | 16.8           |
| East Baywood Lane          | 0.56                             | 352.4                | 04Aug2013, 14:30 | 118.6          |
| U/S Limit FS               | 0.56                             | 352.4                | 04Aug2013, 14:30 | 118.6          |
| FS-4B                      | 0.12                             | 109.9                | 04Aug2013, 14:05 | 26.3           |
| FS-4A                      | 0.10                             | 45.9                 | 04Aug2013, 15:45 | 19.7           |
| RT FS-4A                   | 0.10                             | 45.8                 | 04Aug2013, 15:50 | 19.7           |
| ADD FS-4B                  | 0.22                             | 129.3                | 04Aug2013, 14:10 | 46             |
| RT FS-4B                   | 0.22                             | 124.7                | 04Aug2013, 14:20 | 45.7           |
| Railroad                   | 0.78                             | 474.6                | 04Aug2013, 14:30 | 164.2          |
| FS-5                       | 0.05                             | 103.1                | 04Aug2013, 13:15 | 12.8           |
| Evans Street               | 0.83                             | 487.6                | 04Aug2013, 14:30 | 176.8          |
| FS-6A                      | 0.16                             | 83.2                 | 04Aug2013, 15:40 | 36             |
| FS-6B                      | 0.09                             | 120.2                | 04Aug2013, 13:25 | 16             |
| RT FS-6A-6B                | 0.25                             | 136.2                | 04Aug2013, 13:30 | 51.9           |
| FS-6E                      | 0.11                             | 45.6                 | 04Aug2013, 15:45 | 19.6           |
| FS-6D                      | 0.10                             | 49.7                 | 04Aug2013, 15:10 | 18.4           |
| ADD FS-6D-6E               | 0.20                             | 93.4                 | 04Aug2013, 15:25 | 38             |
| FS-6C                      | 0.15                             | 100                  | 04Aug2013, 14:35 | 30.8           |
| ADD FS-6C                  | 1.44                             | 744                  | 04Aug2013, 14:40 | 297.5          |
| FS-6F                      | 0.17                             | 53.4                 | 04Aug2013, 17:25 | 30.4           |
| ADD FS-6F                  | 1.60                             | 764.7                | 04Aug2013, 14:40 | 327.8          |
| RT FS-6F                   | 1.60                             | 756.4                | 04Aug2013, 14:50 | 326.5          |
| FS-7A                      | 0.15                             | 249.2                | 04Aug2013, 13:15 | 30.1           |
| ADD FS-7A                  | 1.75                             | 786.6                | 04Aug2013, 14:45 | 356.6          |
| RT FS-7A                   | 1.75                             | 786                  | 04Aug2013, 14:50 | 356.1          |
| FS-7B                      | 0.15                             | 92.8                 | 04Aug2013, 14:40 | 28.5           |
| ADD FS-7B                  | 1.90                             | 877                  | 04Aug2013, 14:50 | 384.6          |
| E Fire Tower Road (Bridge) | 1.90                             | 877                  | 04Aug2013, 14:50 | 384.6          |
| RT FS-7B                   | 1.90                             | 871.3                | 04Aug2013, 14:55 | 383.3          |
| FS-8E                      | 0.12                             | 107.9                | 04Aug2013, 13:40 | 18.5           |
| ADD FS8-E                  | 2.03                             | 901.1                | 04Aug2013, 14:50 | 401.8          |
| RT FS-8E                   | 2.03                             | 899.8                | 04Aug2013, 14:55 | 401.3          |
| FS-8B                      | 0.13                             | 59.5                 | 04Aug2013, 15:00 | 20.9           |
| FS-8C                      | 0.09                             | 116.4                | 04Aug2013, 13:35 | 18.7           |
| FS-8A                      | 0.06                             | 22.8                 | 04Aug2013, 16:20 | 11             |
| ADD FS-8A-8B-8C            | 0.28                             | 139.1                | 04Aug2013, 13:35 | 50.5           |
| RT FS-8C                   | 0.28                             | 138.2                | 04Aug2013, 13:45 | 50.4           |
| FS-8D                      | 0.07                             | 93.5                 | 04Aug2013, 13:20 | 11.2           |
| ADD FS-8D                  | 2.38                             | 1011.1               | 04Aug2013, 14:50 | 462.9          |
| ADD FSUT3 to FS            | 5.01                             | 1136.6               | 04Aug2013, 20:50 | 874.4          |
| FS-9                       | 0.14                             | 90.2                 | 04Aug2013, 14:05 | 21.5           |
| ADD FS-9                   | 5.15                             | 1143.2               | 04Aug2013, 20:50 | 896            |
| RT FS-9                    | 5.15                             | 1142.1               | 04Aug2013, 20:55 | 892.9          |
| FSUT2-3                    | 0.21                             | 63.8                 | 04Aug2013, 17:25 | 36.2           |
| FSUT2-1                    | 0.14                             | 115.4                | 04Aug2013, 14:00 | 25.9           |
| U/S Limit FSUT2-2          | 0.14                             | 115.4                | 04Aug2013, 14:00 | 25.9           |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                 | 0.14                                      | 111.2                           | 04Aug2013, 14:05    | 25.8                      |
| FSUT2-2                    | 0.03                                      | 49.9                            | 04Aug2013, 13:20    | 6                         |
| ADD FSUT2-2                | 0.17                                      | 122                             | 04Aug2013, 14:05    | 31.8                      |
| RT FSUT2-2                 | 0.17                                      | 121                             | 04Aug2013, 14:10    | 31.7                      |
| ADD FSUT2-3                | 0.38                                      | 135.9                           | 04Aug2013, 14:10    | 67.9                      |
| RT FSUT2-3                 | 0.38                                      | 135.7                           | 04Aug2013, 14:15    | 67.8                      |
| FSUT2-4                    | 0.14                                      | 72.2                            | 04Aug2013, 15:40    | 31.6                      |
| ADD FSUT2-4                | 0.52                                      | 179.2                           | 04Aug2013, 14:25    | 99.4                      |
| RT FSUT2-4                 | 0.52                                      | 178.5                           | 04Aug2013, 14:30    | 99.1                      |
| FSUT2-5                    | 0.21                                      | 86.1                            | 04Aug2013, 16:45    | 45.9                      |
| West Fire Tower Rd         | 0.73                                      | 240.9                           | 04Aug2013, 16:20    | 144.8                     |
| D/S Limit FSUT2-2          | 0.73                                      | 240.9                           | 04Aug2013, 16:20    | 144.8                     |
| FSUT2-6                    | 0.31                                      | 114.6                           | 04Aug2013, 17:20    | 65.8                      |
| ADD FSUT2-6                | 1.05                                      | 349.9                           | 04Aug2013, 16:40    | 210.5                     |
| RT FSUT2-6                 | 1.05                                      | 349.5                           | 04Aug2013, 16:50    | 209.3                     |
| FSUT2-7A                   | 0.19                                      | 63.8                            | 04Aug2013, 16:55    | 33.6                      |
| ADD FSUT2-7A               | 1.24                                      | 413.3                           | 04Aug2013, 16:50    | 242.9                     |
| RT FSUT2-7A                | 1.24                                      | 412.7                           | 04Aug2013, 16:55    | 241.9                     |
| FSUT2-7B                   | 0.42                                      | 102.7                           | 04Aug2013, 18:35    | 64.3                      |
| ADD FSUT2-7B               | 1.66                                      | 501.5                           | 04Aug2013, 17:10    | 306.1                     |
| FSUT2-8A                   | 0.27                                      | 116.4                           | 04Aug2013, 15:45    | 50                        |
| FSUT2-8B                   | 0.06                                      | 96.4                            | 04Aug2013, 13:15    | 11.6                      |
| U/S Limit FSUT2-1          | 1.99                                      | 598.3                           | 04Aug2013, 16:45    | 367.8                     |
| RT FSUT2-8A-8B             | 1.99                                      | 598.1                           | 04Aug2013, 16:50    | 366.5                     |
| FSUT2-9B                   | 0.11                                      | 75.5                            | 04Aug2013, 14:20    | 20.6                      |
| FSUT2-9A                   | 0.10                                      | 148.2                           | 04Aug2013, 13:20    | 17.8                      |
| ADD FSUT2-9A-9B            | 2.20                                      | 629                             | 04Aug2013, 16:45    | 404.9                     |
| RT FSUT2-9A-9B             | 2.20                                      | 629                             | 04Aug2013, 18:15    | 386.5                     |
| ADD FSUT2                  | 7.35                                      | 1615.3                          | 04Aug2013, 20:30    | 1279.4                    |
| FSUT1-2A                   | 0.45                                      | 82.9                            | 04Aug2013, 20:30    | 55.1                      |
| FSUT1-2B                   | 0.24                                      | 79.5                            | 04Aug2013, 17:00    | 42.5                      |
| ADD FSUT1-2A-2B            | 0.69                                      | 137.5                           | 04Aug2013, 18:15    | 97.6                      |
| FSUT1-2D                   | 0.18                                      | 106.3                           | 04Aug2013, 14:40    | 32.7                      |
| FSUT1-2C                   | 0.11                                      | 130.1                           | 04Aug2013, 13:25    | 17.3                      |
| RT FSUT1-2C                | 0.11                                      | 98.2                            | 04Aug2013, 13:40    | 17                        |
| ADD FSUT1-2D               | 0.98                                      | 189                             | 04Aug2013, 14:30    | 147.3                     |
| RT-FSUT1-2D                | 0.98                                      | 187.7                           | 04Aug2013, 14:50    | 145.2                     |
| FSUT1-2E                   | 0.17                                      | 272.9                           | 04Aug2013, 13:20    | 32.9                      |
| ADD FSUT1-2E               | 1.15                                      | 331.4                           | 04Aug2013, 13:20    | 178.1                     |
| RT FSUT1-2E                | 1.15                                      | 305.7                           | 04Aug2013, 13:25    | 177.3                     |
| FSUT1-2F                   | 0.11                                      | 60.4                            | 04Aug2013, 14:50    | 19.9                      |
| ADD FSUT1-2F               | 1.26                                      | 323.1                           | 04Aug2013, 13:25    | 197.2                     |
| RT FSUT1-2F                | 1.26                                      | 313.9                           | 04Aug2013, 13:25    | 196.8                     |
| FSUT1-1A                   | 0.40                                      | 88.2                            | 04Aug2013, 19:40    | 58.2                      |
| FSUT1-1B                   | 0.39                                      | 110.6                           | 04Aug2013, 18:10    | 67.6                      |
| RT FSUT1-1A-1B             | 0.80                                      | 192.8                           | 04Aug2013, 19:05    | 122.8                     |
| FSUT1-1C                   | 0.27                                      | 112                             | 04Aug2013, 15:45    | 48.1                      |
| U/S Limit FSUT1            | 1.07                                      | 243.5                           | 04Aug2013, 18:10    | 170.9                     |
| FSUT1-2G                   | 0.09                                      | 96.7                            | 04Aug2013, 13:50    | 19.4                      |
| Trafalgar Drive            | 1.16                                      | 251.6                           | 04Aug2013, 18:10    | 189.1                     |
| Corey Road - FSUT1         | 2.41                                      | 461.9                           | 04Aug2013, 16:55    | 385.3                     |
| FSUT1-3                    | 0.19                                      | 86                              | 04Aug2013, 14:40    | 26.8                      |
| ADD FSUT1-3                | 2.60                                      | 529.4                           | 04Aug2013, 15:00    | 412.1                     |
| RT FSUT1                   | 2.60                                      | 529.4                           | 04Aug2013, 21:20    | 252                       |
| FS-10C                     | 0.10                                      | 51                              | 04Aug2013, 14:50    | 16.6                      |
| ADD FSUT1                  | 10.05                                     | 2128.6                          | 04Aug2013, 20:40    | 1547.9                    |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>10-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FS-10                   | 10.05                                     | 2123                            | 04Aug2013, 20:45    | 1540.2                    |
| FS-10D                     | 0.18                                      | 99.8                            | 04Aug2013, 14:50    | 33                        |
| FS-10B                     | 0.15                                      | 96.2                            | 04Aug2013, 14:05    | 22.9                      |
| FS-10A                     | 0.03                                      | 26.6                            | 04Aug2013, 14:10    | 6.6                       |
| RT FS-10A                  | 0.03                                      | 26.3                            | 04Aug2013, 14:30    | 6.5                       |
| ADD FS-10B-10C-10D         | 10.42                                     | 2144.1                          | 04Aug2013, 20:45    | 1602.7                    |
| RT FS-10B-10D              | 10.42                                     | 2140.9                          | 04Aug2013, 20:45    | 1597.5                    |
| FS-10F                     | 0.15                                      | 127                             | 04Aug2013, 13:40    | 22.4                      |
| FS-10E                     | 0.07                                      | 71                              | 04Aug2013, 13:35    | 11.2                      |
| ADD FS-10E-10F             | 10.64                                     | 2150.5                          | 04Aug2013, 20:45    | 1631.2                    |
| RT FS-10E-10F              | 10.64                                     | 2140.8                          | 04Aug2013, 20:50    | 1619.2                    |
| OUTLET                     | 10.64                                     | 2140.8                          | 04Aug2013, 20:50    | 1619.2                    |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>25-YEAR ALTERNATIVE</b>   |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 80.6                            | 04Aug2013, 15:05    | 30.4                      |
| FSUT3-1B                     | 0.10                                      | 113.6                           | 04Aug2013, 13:55    | 24.1                      |
| FSUT3-1C                     | 0.09                                      | 63.6                            | 04Aug2013, 14:40    | 19.6                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 214.9                           | 04Aug2013, 14:15    | 74                        |
| FSUT3-1D                     | 0.17                                      | 104.9                           | 04Aug2013, 15:40    | 45.4                      |
| RT FSUT3-1D                  | 0.17                                      | 104.9                           | 04Aug2013, 15:40    | 45.4                      |
| FSUT3-1E                     | 0.04                                      | 62.7                            | 04Aug2013, 13:25    | 8.3                       |
| U/S Limit FSUT3              | 0.49                                      | 294                             | 04Aug2013, 14:40    | 127.8                     |
| RT FSUT3-1E                  | 0.49                                      | 293.3                           | 04Aug2013, 14:45    | 127.3                     |
| FSUT3-2A                     | 0.08                                      | 46.6                            | 04Aug2013, 15:15    | 17.4                      |
| ADD FSUT3-2A                 | 0.58                                      | 337.8                           | 04Aug2013, 14:55    | 144.7                     |
| RT FSUT3-2A                  | 0.58                                      | 337.4                           | 04Aug2013, 15:00    | 144.4                     |
| FSUT3-2B                     | 0.11                                      | 63.9                            | 04Aug2013, 15:10    | 23.7                      |
| ADD FSUT3-2B                 | 0.69                                      | 400.4                           | 04Aug2013, 15:00    | 168.2                     |
| RT FSUT3-2B                  | 0.69                                      | 398.1                           | 04Aug2013, 15:10    | 167.4                     |
| FSUT3-3                      | 0.09                                      | 192.5                           | 04Aug2013, 13:15    | 23.3                      |
| ADD FSUT3-3                  | 0.78                                      | 418.8                           | 04Aug2013, 15:05    | 190.6                     |
| Coleman Drive                | 0.78                                      | 418.5                           | 04Aug2013, 15:05    | 190.6                     |
| FSUT3-5                      | 0.16                                      | 150.3                           | 04Aug2013, 14:35    | 47.1                      |
| Country Home Road            | 0.16                                      | 150.3                           | 04Aug2013, 14:35    | 47.1                      |
| RT FSUT3-5                   | 0.16                                      | 150.3                           | 04Aug2013, 14:35    | 47.1                      |
| FSUT3-6                      | 0.11                                      | 107.5                           | 04Aug2013, 14:35    | 34                        |
| ADD FSUT3-6                  | 0.27                                      | 257.7                           | 04Aug2013, 14:35    | 81                        |
| East Fire Tower Road - North | 0.27                                      | 254.9                           | 04Aug2013, 14:45    | 81                        |
| FSUT3-4C                     | 0.13                                      | 72                              | 04Aug2013, 16:15    | 34.9                      |
| FSUT3-4B                     | 0.07                                      | 95.5                            | 04Aug2013, 13:55    | 20.9                      |
| FSUT3-4A                     | 0.07                                      | 35.9                            | 04Aug2013, 16:15    | 17.4                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 131.6                           | 04Aug2013, 14:00    | 73.1                      |
| RT FSUT3-4C                  | 0.27                                      | 131.3                           | 04Aug2013, 14:10    | 72.8                      |
| FSUT3-4D                     | 0.08                                      | 200.8                           | 04Aug2013, 13:15    | 24.6                      |
| ADD FSUT3-4D                 | 0.62                                      | 399.3                           | 04Aug2013, 14:35    | 178.5                     |
| Wimbledon Drive              | 0.62                                      | 399                             | 04Aug2013, 14:40    | 178.4                     |
| FSUT3-7                      | 0.14                                      | 79.2                            | 04Aug2013, 16:15    | 38.5                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 451.5                           | 04Aug2013, 14:55    | 216.8                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 867.7                           | 04Aug2013, 15:00    | 407.4                     |
| FSUT3-8                      | 0.08                                      | 101.6                           | 04Aug2013, 13:45    | 18.9                      |
| East Fire Tower - South      | 1.62                                      | 897.6                           | 04Aug2013, 15:00    | 426.2                     |
| FSUT3-9B                     | 0.16                                      | 69.9                            | 04Aug2013, 17:20    | 39.9                      |
| FSUT3-9A                     | 0.05                                      | 61.8                            | 04Aug2013, 14:05    | 14.8                      |
| RT FSUT3-9A                  | 0.05                                      | 60.5                            | 04Aug2013, 14:20    | 14.7                      |
| ADD FSUT3-9B                 | 0.22                                      | 83.2                            | 04Aug2013, 14:30    | 54.6                      |
| Corey Road - FSUT3           | 0.22                                      | 83.2                            | 04Aug2013, 14:30    | 54.6                      |
| FSUT3-9C                     | 0.16                                      | 92.9                            | 04Aug2013, 15:45    | 40                        |
| ADD FSUT3-9C                 | 1.99                                      | 1058                            | 04Aug2013, 15:00    | 520.8                     |
| RT FSUT 3-9C                 | 1.99                                      | 1055.7                          | 04Aug2013, 15:05    | 519.7                     |
| FSUT3-9D                     | 0.09                                      | 205.2                           | 04Aug2013, 13:15    | 25.1                      |
| ADD FSUT3-9D                 | 2.08                                      | 1076.7                          | 04Aug2013, 15:05    | 544.8                     |
| RT FSUT3-9D                  | 2.08                                      | 1074.3                          | 04Aug2013, 15:10    | 543                       |
| FSUT3-10A                    | 0.24                                      | 109.8                           | 04Aug2013, 16:50    | 58                        |
| ADD FSUT3-10A                | 2.32                                      | 1150.5                          | 04Aug2013, 15:15    | 601                       |
| RT FSUT3-10A                 | 2.32                                      | 1149.2                          | 04Aug2013, 15:20    | 599.7                     |
| FSUT3-10C                    | 0.22                                      | 109.5                           | 04Aug2013, 15:45    | 47                        |
| FSUT3-10B                    | 0.09                                      | 208.3                           | 04Aug2013, 13:15    | 25.5                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 1273.7                          | 04Aug2013, 15:20    | 672.3                     |
| RT FSUT3                     | 2.63                                      | 1273.7                          | 04Aug2013, 20:50    | 562.7                     |
| FS-1B                        | 0.13                                      | 118.1                           | 04Aug2013, 14:35    | 36.7                      |



**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>25-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FS-1A                      | 0.12                                      | 117.4                           | 04Aug2013, 14:35    | 37.1                      |
| RT FS-1A                   | 0.12                                      | 117.2                           | 04Aug2013, 14:40    | 37.1                      |
| ADD FS-1B                  | 0.25                                      | 235.1                           | 04Aug2013, 14:35    | 73.8                      |
| RT FS-1B                   | 0.25                                      | 233.9                           | 04Aug2013, 14:40    | 73.6                      |
| FS-2A                      | 0.16                                      | 129.5                           | 04Aug2013, 14:35    | 39.9                      |
| RT FS-2A                   | 0.16                                      | 129                             | 04Aug2013, 14:40    | 39.8                      |
| FS-2B                      | 0.08                                      | 147.2                           | 04Aug2013, 13:30    | 22.2                      |
| ADD FS-2B                  | 0.23                                      | 191.5                           | 04Aug2013, 13:30    | 62                        |
| RT FS-2B                   | 0.23                                      | 189.5                           | 04Aug2013, 13:35    | 61.9                      |
| ADD FS1-2                  | 0.48                                      | 391.2                           | 04Aug2013, 14:40    | 135.5                     |
| FS-3                       | 0.08                                      | 95.1                            | 04Aug2013, 14:05    | 22.7                      |
| East Baywood Lane          | 0.56                                      | 467.7                           | 04Aug2013, 14:30    | 158.1                     |
| U/S Limit FS               | 0.56                                      | 467.7                           | 04Aug2013, 14:30    | 158.1                     |
| FS-4B                      | 0.12                                      | 143.8                           | 04Aug2013, 14:05    | 34.7                      |
| FS-4A                      | 0.10                                      | 61.4                            | 04Aug2013, 15:40    | 26.5                      |
| RT FS-4A                   | 0.10                                      | 61.3                            | 04Aug2013, 15:45    | 26.4                      |
| ADD FS-4B                  | 0.22                                      | 171                             | 04Aug2013, 14:10    | 61.2                      |
| RT FS-4B                   | 0.22                                      | 165.2                           | 04Aug2013, 14:15    | 60.9                      |
| Railroad                   | 0.78                                      | 629.3                           | 04Aug2013, 14:30    | 218.9                     |
| FS-5                       | 0.05                                      | 132.2                           | 04Aug2013, 13:15    | 16.6                      |
| Evans Street               | 0.83                                      | 643.8                           | 04Aug2013, 14:35    | 235.1                     |
| FS-6A                      | 0.16                                      | 108.8                           | 04Aug2013, 15:40    | 47.5                      |
| FS-6B                      | 0.09                                      | 165.1                           | 04Aug2013, 13:25    | 22.1                      |
| RT FS-6A-6B                | 0.25                                      | 188.1                           | 04Aug2013, 13:30    | 69.4                      |
| FS-6E                      | 0.11                                      | 61.9                            | 04Aug2013, 15:45    | 26.6                      |
| FS-6D                      | 0.10                                      | 67.5                            | 04Aug2013, 15:10    | 25.1                      |
| ADD FS-6D-6E               | 0.20                                      | 127                             | 04Aug2013, 15:20    | 51.7                      |
| FS-6C                      | 0.15                                      | 133.5                           | 04Aug2013, 14:35    | 41.3                      |
| ADD FS-6C                  | 1.44                                      | 991.8                           | 04Aug2013, 14:40    | 397.5                     |
| FS-6F                      | 0.17                                      | 71.9                            | 04Aug2013, 17:20    | 41.1                      |
| ADD FS-6F                  | 1.60                                      | 1022                            | 04Aug2013, 14:45    | 438.6                     |
| RT FS-6F                   | 1.60                                      | 1012.3                          | 04Aug2013, 14:50    | 437                       |
| FS-7A                      | 0.15                                      | 333.5                           | 04Aug2013, 13:15    | 40.5                      |
| ADD FS-7A                  | 1.75                                      | 1051.2                          | 04Aug2013, 14:45    | 477.5                     |
| RT FS-7A                   | 1.75                                      | 1050.5                          | 04Aug2013, 14:50    | 476.9                     |
| FS-7B                      | 0.15                                      | 126.1                           | 04Aug2013, 14:35    | 38.8                      |
| ADD FS-7B                  | 1.90                                      | 1173.5                          | 04Aug2013, 14:50    | 515.7                     |
| E Fire Tower Road (Bridge) | 1.90                                      | 1173.5                          | 04Aug2013, 14:50    | 515.7                     |
| RT FS-7B                   | 1.90                                      | 1166.6                          | 04Aug2013, 14:50    | 514.1                     |
| FS-8E                      | 0.12                                      | 153.8                           | 04Aug2013, 13:40    | 26.2                      |
| ADD FS8-E                  | 2.03                                      | 1208.2                          | 04Aug2013, 14:50    | 540.3                     |
| RT FS-8E                   | 2.03                                      | 1207.1                          | 04Aug2013, 14:50    | 539.8                     |
| FS-8B                      | 0.13                                      | 82.9                            | 04Aug2013, 15:00    | 29.1                      |
| FS-8C                      | 0.09                                      | 156.3                           | 04Aug2013, 13:35    | 25.2                      |
| FS-8A                      | 0.06                                      | 31.4                            | 04Aug2013, 16:15    | 15.1                      |
| ADD FS-8A-8B-8C            | 0.28                                      | 190.8                           | 04Aug2013, 13:35    | 69.4                      |
| RT FS-8C                   | 0.28                                      | 188.9                           | 04Aug2013, 13:45    | 69.3                      |
| FS-8D                      | 0.07                                      | 130.9                           | 04Aug2013, 13:20    | 15.7                      |
| ADD FS-8D                  | 2.38                                      | 1360                            | 04Aug2013, 14:50    | 624.8                     |
| ADD FSUT3 to FS            | 5.01                                      | 1526.3                          | 04Aug2013, 20:40    | 1187.5                    |
| FS-9                       | 0.14                                      | 128.2                           | 04Aug2013, 14:05    | 30.4                      |
| ADD FS-9                   | 5.15                                      | 1535.1                          | 04Aug2013, 20:40    | 1217.9                    |
| RT FS-9                    | 5.15                                      | 1533.6                          | 04Aug2013, 20:45    | 1214.1                    |
| FSUT2-3                    | 0.21                                      | 87.4                            | 04Aug2013, 17:25    | 49.7                      |
| FSUT2-1                    | 0.14                                      | 156.4                           | 04Aug2013, 14:00    | 35.2                      |
| U/S Limit FSUT2-2          | 0.14                                      | 156.4                           | 04Aug2013, 14:00    | 35.2                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>25-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                 | 0.14                                      | 151.2                           | 04Aug2013, 14:05    | 35.1                      |
| FSUT2-2                    | 0.03                                      | 67.5                            | 04Aug2013, 13:15    | 8.2                       |
| ADD FSUT2-2                | 0.17                                      | 165.4                           | 04Aug2013, 14:00    | 43.3                      |
| RT FSUT2-2                 | 0.17                                      | 164.7                           | 04Aug2013, 14:05    | 43.2                      |
| ADD FSUT2-3                | 0.38                                      | 186.5                           | 04Aug2013, 14:10    | 92.9                      |
| RT FSUT2-3                 | 0.38                                      | 186.1                           | 04Aug2013, 14:10    | 92.8                      |
| FSUT2-4                    | 0.14                                      | 94                              | 04Aug2013, 15:40    | 41.5                      |
| ADD FSUT2-4                | 0.52                                      | 242                             | 04Aug2013, 14:25    | 134.2                     |
| RT FSUT2-4                 | 0.52                                      | 241.1                           | 04Aug2013, 14:30    | 133.9                     |
| FSUT2-5                    | 0.21                                      | 112.7                           | 04Aug2013, 16:45    | 60.5                      |
| West Fire Tower Rd         | 0.73                                      | 318.9                           | 04Aug2013, 16:20    | 194                       |
| D/S Limit FSUT2-2          | 0.73                                      | 318.9                           | 04Aug2013, 16:20    | 194                       |
| FSUT2-6                    | 0.31                                      | 150.1                           | 04Aug2013, 17:20    | 86.8                      |
| ADD FSUT2-6                | 1.05                                      | 462.2                           | 04Aug2013, 16:40    | 280.8                     |
| RT FSUT2-6                 | 1.05                                      | 461.7                           | 04Aug2013, 16:50    | 279.3                     |
| FSUT2-7A                   | 0.19                                      | 87.3                            | 04Aug2013, 16:50    | 46.1                      |
| ADD FSUT2-7A               | 1.24                                      | 549                             | 04Aug2013, 16:50    | 325.4                     |
| RT FSUT2-7A                | 1.24                                      | 548.3                           | 04Aug2013, 16:55    | 324.1                     |
| FSUT2-7B                   | 0.42                                      | 141.4                           | 04Aug2013, 18:30    | 88.9                      |
| ADD FSUT2-7B               | 1.66                                      | 671.7                           | 04Aug2013, 17:10    | 413.1                     |
| FSUT2-8A                   | 0.27                                      | 158.3                           | 04Aug2013, 15:45    | 68.1                      |
| FSUT2-8B                   | 0.06                                      | 129.1                           | 04Aug2013, 13:15    | 15.7                      |
| U/S Limit FSUT2-1          | 1.99                                      | 803                             | 04Aug2013, 16:45    | 496.8                     |
| RT FSUT2-8A-8B             | 1.99                                      | 802.7                           | 04Aug2013, 16:50    | 495.2                     |
| FSUT2-9B                   | 0.11                                      | 103.2                           | 04Aug2013, 14:20    | 28.2                      |
| FSUT2-9A                   | 0.10                                      | 202.6                           | 04Aug2013, 13:15    | 24.4                      |
| ADD FSUT2-9A-9B            | 2.20                                      | 844.2                           | 04Aug2013, 16:40    | 547.9                     |
| RT FSUT2-9A-9B             | 2.20                                      | 844.2                           | 04Aug2013, 18:10    | 524                       |
| ADD FSUT2                  | 7.35                                      | 2177.5                          | 04Aug2013, 20:20    | 1738.1                    |
| FSUT1-2A                   | 0.45                                      | 115.6                           | 04Aug2013, 20:25    | 77.4                      |
| FSUT1-2B                   | 0.24                                      | 108.2                           | 04Aug2013, 16:55    | 58                        |
| ADD FSUT1-2A-2B            | 0.69                                      | 190                             | 04Aug2013, 18:10    | 135.4                     |
| FSUT1-2D                   | 0.18                                      | 145.1                           | 04Aug2013, 14:35    | 44.7                      |
| FSUT1-2C                   | 0.11                                      | 183.7                           | 04Aug2013, 13:25    | 24.5                      |
| RT FSUT1-2C                | 0.11                                      | 140.3                           | 04Aug2013, 13:40    | 24.1                      |
| ADD FSUT1-2D               | 0.98                                      | 261.3                           | 04Aug2013, 14:20    | 204.2                     |
| RT-FSUT1-2D                | 0.98                                      | 259.5                           | 04Aug2013, 14:45    | 201.6                     |
| FSUT1-2E                   | 0.17                                      | 369.7                           | 04Aug2013, 13:15    | 44.7                      |
| ADD FSUT1-2E               | 1.15                                      | 471                             | 04Aug2013, 13:20    | 246.4                     |
| RT FSUT1-2E                | 1.15                                      | 436.9                           | 04Aug2013, 13:20    | 245.4                     |
| FSUT1-2F                   | 0.11                                      | 81.9                            | 04Aug2013, 14:50    | 27                        |
| ADD FSUT1-2F               | 1.26                                      | 461.7                           | 04Aug2013, 13:25    | 272.4                     |
| RT FSUT1-2F                | 1.26                                      | 450.2                           | 04Aug2013, 13:25    | 272                       |
| FSUT1-1A                   | 0.40                                      | 120.8                           | 04Aug2013, 19:35    | 80.3                      |
| FSUT1-1B                   | 0.39                                      | 149.6                           | 04Aug2013, 18:05    | 91.9                      |
| RT FSUT1-1A-1B             | 0.80                                      | 262.6                           | 04Aug2013, 18:55    | 168.5                     |
| FSUT1-1C                   | 0.27                                      | 153.3                           | 04Aug2013, 15:45    | 65.9                      |
| U/S Limit FSUT1            | 1.07                                      | 332.3                           | 04Aug2013, 18:00    | 234.4                     |
| FSUT1-2G                   | 0.09                                      | 127.9                           | 04Aug2013, 13:50    | 25.8                      |
| Trafalgar Drive            | 1.16                                      | 343.3                           | 04Aug2013, 17:55    | 258.7                     |
| Corey Road - FSUT1         | 2.41                                      | 634.2                           | 04Aug2013, 16:55    | 529.9                     |
| FSUT1-3                    | 0.19                                      | 124.1                           | 04Aug2013, 14:40    | 38.3                      |
| ADD FSUT1-3                | 2.60                                      | 734.1                           | 04Aug2013, 14:55    | 568.2                     |
| RT FSUT1                   | 2.60                                      | 734.1                           | 04Aug2013, 21:15    | 353                       |
| FS-10C                     | 0.10                                      | 71.5                            | 04Aug2013, 14:45    | 23.2                      |
| ADD FSUT1                  | 10.05                                     | 2885.8                          | 04Aug2013, 20:35    | 2114.3                    |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 25-YEAR ALTERNATIVE |                                     |                         |                  |                   |
|---------------------|-------------------------------------|-------------------------|------------------|-------------------|
| Hydrologic Element  | Drainage Area<br>(mi <sup>2</sup> ) | Peak Discharge<br>(CFS) | Time of Peak     | Volume<br>(AC-FT) |
| RT FS-10            | 10.05                               | 2878.2                  | 04Aug2013, 20:35 | 2104.7            |
| FS-10D              | 0.18                                | 136.4                   | 04Aug2013, 14:50 | 45.2              |
| FS-10B              | 0.15                                | 137.7                   | 04Aug2013, 14:05 | 32.5              |
| FS-10A              | 0.03                                | 35.8                    | 04Aug2013, 14:10 | 8.9               |
| RT FS-10A           | 0.03                                | 35.5                    | 04Aug2013, 14:30 | 8.8               |
| ADD FS-10B-10C-10D  | 10.42                               | 2906.7                  | 04Aug2013, 20:35 | 2191.2            |
| RT FS-10B-10D       | 10.42                               | 2902.1                  | 04Aug2013, 20:40 | 2184.9            |
| FS-10F              | 0.15                                | 182.7                   | 04Aug2013, 13:40 | 32                |
| FS-10E              | 0.07                                | 98.3                    | 04Aug2013, 13:35 | 15.6              |
| ADD FS-10E-10F      | 10.64                               | 2914.9                  | 04Aug2013, 20:40 | 2232.4            |
| RT FS-10E-10F       | 10.64                               | 2901.4                  | 04Aug2013, 20:45 | 2217.6            |
| OUTLET              | 10.64                               | 2901.4                  | 04Aug2013, 20:45 | 2217.6            |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR ALTERNATIVE</b>   |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 97.5                            | 04Aug2013, 15:05    | 36.9                      |
| FSUT3-1B                     | 0.10                                      | 140.3                           | 04Aug2013, 13:55    | 29.9                      |
| FSUT3-1C                     | 0.09                                      | 80.5                            | 04Aug2013, 14:40    | 24.8                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 266.2                           | 04Aug2013, 14:15    | 91.6                      |
| FSUT3-1D                     | 0.17                                      | 127.6                           | 04Aug2013, 15:40    | 55.5                      |
| RT FSUT3-1D                  | 0.17                                      | 127.6                           | 04Aug2013, 15:40    | 55.5                      |
| FSUT3-1E                     | 0.04                                      | 79                              | 04Aug2013, 13:25    | 10.6                      |
| U/S Limit FSUT3              | 0.49                                      | 362.2                           | 04Aug2013, 14:35    | 157.6                     |
| RT FSUT3-1E                  | 0.49                                      | 361.3                           | 04Aug2013, 14:40    | 157.2                     |
| FSUT3-2A                     | 0.08                                      | 59.4                            | 04Aug2013, 15:10    | 22.1                      |
| ADD FSUT3-2A                 | 0.58                                      | 417.6                           | 04Aug2013, 14:50    | 179.2                     |
| RT FSUT3-2A                  | 0.58                                      | 417.2                           | 04Aug2013, 14:55    | 178.9                     |
| FSUT3-2B                     | 0.11                                      | 81                              | 04Aug2013, 15:10    | 30.1                      |
| ADD FSUT3-2B                 | 0.69                                      | 496.8                           | 04Aug2013, 15:00    | 209                       |
| RT FSUT3-2B                  | 0.69                                      | 494.2                           | 04Aug2013, 15:05    | 208.2                     |
| FSUT3-3                      | 0.09                                      | 237.8                           | 04Aug2013, 13:15    | 28.8                      |
| ADD FSUT3-3                  | 0.78                                      | 519.4                           | 04Aug2013, 15:00    | 237                       |
| Coleman Drive                | 0.78                                      | 519.3                           | 04Aug2013, 15:05    | 237                       |
| FSUT3-5                      | 0.16                                      | 180.8                           | 04Aug2013, 14:35    | 57.1                      |
| Country Home Road            | 0.16                                      | 180.8                           | 04Aug2013, 14:35    | 57.1                      |
| RT FSUT3-5                   | 0.16                                      | 180.8                           | 04Aug2013, 14:35    | 57.1                      |
| FSUT3-6                      | 0.11                                      | 128.5                           | 04Aug2013, 14:35    | 40.9                      |
| ADD FSUT3-6                  | 0.27                                      | 309.4                           | 04Aug2013, 14:35    | 98                        |
| East Fire Tower Road - North | 0.27                                      | 296.9                           | 04Aug2013, 14:50    | 98                        |
| FSUT3-4C                     | 0.13                                      | 87.9                            | 04Aug2013, 16:15    | 42.8                      |
| FSUT3-4B                     | 0.07                                      | 114.4                           | 04Aug2013, 13:55    | 25.2                      |
| FSUT3-4A                     | 0.07                                      | 44                              | 04Aug2013, 16:15    | 21.4                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 160.4                           | 04Aug2013, 14:00    | 89.4                      |
| RT FSUT3-4C                  | 0.27                                      | 159.9                           | 04Aug2013, 14:10    | 89.1                      |
| FSUT3-4D                     | 0.08                                      | 242.7                           | 04Aug2013, 13:15    | 30                        |
| ADD FSUT3-4D                 | 0.62                                      | 468.6                           | 04Aug2013, 14:45    | 217                       |
| Wimbledon Drive              | 0.62                                      | 468.5                           | 04Aug2013, 14:50    | 217                       |
| FSUT3-7                      | 0.14                                      | 96.4                            | 04Aug2013, 16:15    | 47.1                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 541.6                           | 04Aug2013, 15:05    | 264                       |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 1061                            | 04Aug2013, 15:05    | 501                       |
| FSUT3-8                      | 0.08                                      | 126.3                           | 04Aug2013, 13:45    | 23.6                      |
| East Fire Tower - South      | 1.62                                      | 1095                            | 04Aug2013, 15:00    | 524.4                     |
| FSUT3-9B                     | 0.16                                      | 86.1                            | 04Aug2013, 17:20    | 49.3                      |
| FSUT3-9A                     | 0.05                                      | 75                              | 04Aug2013, 14:05    | 18.1                      |
| RT FSUT3-9A                  | 0.05                                      | 73.3                            | 04Aug2013, 14:20    | 18                        |
| ADD FSUT3-9B                 | 0.22                                      | 102.3                           | 04Aug2013, 14:25    | 67.3                      |
| Corey Road - FSUT3           | 0.22                                      | 102.3                           | 04Aug2013, 14:25    | 67.3                      |
| FSUT3-9C                     | 0.16                                      | 114.7                           | 04Aug2013, 15:40    | 49.5                      |
| ADD FSUT3-9C                 | 1.99                                      | 1295                            | 04Aug2013, 15:05    | 641.3                     |
| RT FSUT 3-9C                 | 1.99                                      | 1292.5                          | 04Aug2013, 15:10    | 640.1                     |
| FSUT3-9D                     | 0.09                                      | 248.9                           | 04Aug2013, 13:15    | 30.6                      |
| ADD FSUT3-9D                 | 2.08                                      | 1317.4                          | 04Aug2013, 15:05    | 670.7                     |
| RT FSUT3-9D                  | 2.08                                      | 1314.5                          | 04Aug2013, 15:10    | 668.6                     |
| FSUT3-10A                    | 0.24                                      | 136.1                           | 04Aug2013, 16:50    | 72.1                      |
| ADD FSUT3-10A                | 2.32                                      | 1414.1                          | 04Aug2013, 15:20    | 740.7                     |
| RT FSUT3-10A                 | 2.32                                      | 1412.3                          | 04Aug2013, 15:25    | 739.2                     |
| FSUT3-10C                    | 0.22                                      | 138.4                           | 04Aug2013, 15:45    | 59.4                      |
| FSUT3-10B                    | 0.09                                      | 251.7                           | 04Aug2013, 13:15    | 31.1                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 1570                            | 04Aug2013, 15:25    | 829.7                     |
| RT FSUT3                     | 2.63                                      | 1570                            | 04Aug2013, 20:55    | 698.4                     |
| FS-1B                        | 0.13                                      | 143                             | 04Aug2013, 14:35    | 44.8                      |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 50-YEAR ALTERNATIVE        |                                  |                      |                  |                |
|----------------------------|----------------------------------|----------------------|------------------|----------------|
| Hydrologic Element         | Drainage Area (mi <sup>2</sup> ) | Peak Discharge (CFS) | Time of Peak     | Volume (AC-FT) |
| FS-1A                      | 0.12                             | 140.4                | 04Aug2013, 14:35 | 44.7           |
| RT FS-1A                   | 0.12                             | 140.1                | 04Aug2013, 14:35 | 44.7           |
| ADD FS-1B                  | 0.25                             | 283.1                | 04Aug2013, 14:35 | 89.5           |
| RT FS-1B                   | 0.25                             | 281.6                | 04Aug2013, 14:40 | 89.3           |
| FS-2A                      | 0.16                             | 159.7                | 04Aug2013, 14:35 | 49.4           |
| RT FS-2A                   | 0.16                             | 159.2                | 04Aug2013, 14:40 | 49.3           |
| FS-2B                      | 0.08                             | 177.7                | 04Aug2013, 13:30 | 27             |
| ADD FS-2B                  | 0.23                             | 234.7                | 04Aug2013, 13:30 | 76.3           |
| RT FS-2B                   | 0.23                             | 232.2                | 04Aug2013, 13:35 | 76.2           |
| ADD FS1-2                  | 0.48                             | 474.7                | 04Aug2013, 14:35 | 165.5          |
| FS-3                       | 0.08                             | 116.2                | 04Aug2013, 14:05 | 27.9           |
| East Baywood Lane          | 0.56                             | 569.1                | 04Aug2013, 14:30 | 193.2          |
| U/S Limit FS               | 0.56                             | 569.1                | 04Aug2013, 14:30 | 193.2          |
| FS-4B                      | 0.12                             | 173.4                | 04Aug2013, 14:05 | 42.2           |
| FS-4A                      | 0.10                             | 75                   | 04Aug2013, 15:40 | 32.5           |
| RT FS-4A                   | 0.10                             | 74.8                 | 04Aug2013, 15:45 | 32.5           |
| ADD FS-4B                  | 0.22                             | 207.6                | 04Aug2013, 14:10 | 74.6           |
| RT FS-4B                   | 0.22                             | 200.6                | 04Aug2013, 14:15 | 74.3           |
| Railroad                   | 0.78                             | 765.1                | 04Aug2013, 14:30 | 267.4          |
| FS-5                       | 0.05                             | 157.4                | 04Aug2013, 13:15 | 20             |
| Evans Street               | 0.83                             | 785.4                | 04Aug2013, 14:30 | 286.9          |
| FS-6A                      | 0.16                             | 131.1                | 04Aug2013, 15:40 | 57.6           |
| FS-6B                      | 0.09                             | 204.8                | 04Aug2013, 13:25 | 27.6           |
| RT FS-6A-6B                | 0.25                             | 233.7                | 04Aug2013, 13:30 | 85             |
| FS-6E                      | 0.11                             | 76.5                 | 04Aug2013, 15:40 | 33             |
| FS-6D                      | 0.10                             | 83.3                 | 04Aug2013, 15:10 | 31.1           |
| ADD FS-6D-6E               | 0.20                             | 156.8                | 04Aug2013, 15:20 | 64             |
| FS-6C                      | 0.15                             | 162.8                | 04Aug2013, 14:35 | 50.7           |
| ADD FS-6C                  | 1.44                             | 1205.5               | 04Aug2013, 14:40 | 486.6          |
| FS-6F                      | 0.17                             | 88.2                 | 04Aug2013, 17:20 | 50.6           |
| ADD FS-6F                  | 1.60                             | 1243                 | 04Aug2013, 14:40 | 537.2          |
| RT FS-6F                   | 1.60                             | 1231.4               | 04Aug2013, 14:45 | 535.3          |
| FS-7A                      | 0.15                             | 407.2                | 04Aug2013, 13:15 | 49.8           |
| ADD FS-7A                  | 1.75                             | 1279.1               | 04Aug2013, 14:45 | 585.1          |
| RT FS-7A                   | 1.75                             | 1278.2               | 04Aug2013, 14:45 | 584.4          |
| FS-7B                      | 0.15                             | 155.4                | 04Aug2013, 14:35 | 48.1           |
| ADD FS-7B                  | 1.90                             | 1431.8               | 04Aug2013, 14:45 | 632.5          |
| E Fire Tower Road (Bridge) | 1.90                             | 1431.8               | 04Aug2013, 14:45 | 632.5          |
| RT FS-7B                   | 1.90                             | 1423.3               | 04Aug2013, 14:50 | 630.6          |
| FS-8E                      | 0.12                             | 195.1                | 04Aug2013, 13:40 | 33.3           |
| ADD FS8-E                  | 2.03                             | 1477.9               | 04Aug2013, 14:45 | 663.9          |
| RT FS-8E                   | 2.03                             | 1476.7               | 04Aug2013, 14:45 | 663.2          |
| FS-8B                      | 0.13                             | 103.8                | 04Aug2013, 15:00 | 36.4           |
| FS-8C                      | 0.09                             | 191.3                | 04Aug2013, 13:35 | 31.1           |
| FS-8A                      | 0.06                             | 39                   | 04Aug2013, 16:15 | 18.8           |
| ADD FS-8A-8B-8C            | 0.28                             | 236.7                | 04Aug2013, 13:35 | 86.4           |
| RT FS-8C                   | 0.28                             | 234.6                | 04Aug2013, 13:40 | 86.2           |
| FS-8D                      | 0.07                             | 164.3                | 04Aug2013, 13:15 | 19.8           |
| ADD FS-8D                  | 2.38                             | 1667.6               | 04Aug2013, 14:45 | 769.3          |
| ADD FSUT3 to FS            | 5.01                             | 1868                 | 04Aug2013, 20:45 | 1467.7         |
| FS-9                       | 0.14                             | 162.4                | 04Aug2013, 14:05 | 38.4           |
| ADD FS-9                   | 5.15                             | 1878.6               | 04Aug2013, 20:45 | 1506.1         |
| RT FS-9                    | 5.15                             | 1876.7               | 04Aug2013, 20:45 | 1501.7         |
| FSUT2-3                    | 0.21                             | 108.3                | 04Aug2013, 17:20 | 61.8           |
| FSUT2-1                    | 0.14                             | 192.5                | 04Aug2013, 14:00 | 43.6           |
| U/S Limit FSUT2-2          | 0.14                             | 192.5                | 04Aug2013, 14:00 | 43.6           |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                 | 0.14                                      | 186.3                           | 04Aug2013, 14:05    | 43.4                      |
| FSUT2-2                    | 0.03                                      | 83.1                            | 04Aug2013, 13:15    | 10.1                      |
| ADD FSUT2-2                | 0.17                                      | 204                             | 04Aug2013, 14:00    | 53.5                      |
| RT FSUT2-2                 | 0.17                                      | 203                             | 04Aug2013, 14:05    | 53.4                      |
| ADD FSUT2-3                | 0.38                                      | 231                             | 04Aug2013, 14:10    | 115.3                     |
| RT FSUT2-3                 | 0.38                                      | 230.8                           | 04Aug2013, 14:10    | 115.2                     |
| FSUT2-4                    | 0.14                                      | 112.9                           | 04Aug2013, 15:40    | 50.1                      |
| ADD FSUT2-4                | 0.52                                      | 297.5                           | 04Aug2013, 14:20    | 165.3                     |
| RT FSUT2-4                 | 0.52                                      | 296.4                           | 04Aug2013, 14:25    | 164.8                     |
| FSUT2-5                    | 0.21                                      | 136                             | 04Aug2013, 16:45    | 73.4                      |
| West Fire Tower Rd         | 0.73                                      | 388.5                           | 04Aug2013, 16:15    | 237.9                     |
| D/S Limit FSUT2-2          | 0.73                                      | 388.5                           | 04Aug2013, 16:15    | 237.9                     |
| FSUT2-6                    | 0.31                                      | 181.1                           | 04Aug2013, 17:15    | 105.4                     |
| ADD FSUT2-6                | 1.05                                      | 559.7                           | 04Aug2013, 16:35    | 343.2                     |
| RT FSUT2-6                 | 1.05                                      | 559.1                           | 04Aug2013, 16:45    | 341.5                     |
| FSUT2-7A                   | 0.19                                      | 108.2                           | 04Aug2013, 16:50    | 57.4                      |
| ADD FSUT2-7A               | 1.24                                      | 667.2                           | 04Aug2013, 16:45    | 398.8                     |
| RT FSUT2-7A                | 1.24                                      | 666.5                           | 04Aug2013, 16:50    | 397.3                     |
| FSUT2-7B                   | 0.42                                      | 176                             | 04Aug2013, 18:30    | 111.2                     |
| ADD FSUT2-7B               | 1.66                                      | 819.1                           | 04Aug2013, 17:05    | 508.5                     |
| FSUT2-8A                   | 0.27                                      | 195.4                           | 04Aug2013, 15:40    | 84.3                      |
| FSUT2-8B                   | 0.06                                      | 157.6                           | 04Aug2013, 13:15    | 19.3                      |
| U/S Limit FSUT2-1          | 1.99                                      | 983.7                           | 04Aug2013, 16:40    | 612                       |
| RT FSUT2-8A-8B             | 1.99                                      | 983.1                           | 04Aug2013, 16:45    | 610.2                     |
| FSUT2-9B                   | 0.11                                      | 127.6                           | 04Aug2013, 14:20    | 35                        |
| FSUT2-9A                   | 0.10                                      | 251.2                           | 04Aug2013, 13:15    | 30.4                      |
| ADD FSUT2-9A-9B            | 2.20                                      | 1034.5                          | 04Aug2013, 16:35    | 675.6                     |
| RT FSUT2-9A-9B             | 2.20                                      | 1034.5                          | 04Aug2013, 18:05    | 647                       |
| ADD FSUT2                  | 7.35                                      | 2662.9                          | 04Aug2013, 20:15    | 2148.7                    |
| FSUT1-2A                   | 0.45                                      | 144.9                           | 04Aug2013, 20:20    | 97.7                      |
| FSUT1-2B                   | 0.24                                      | 133.7                           | 04Aug2013, 16:55    | 71.9                      |
| ADD FSUT1-2A-2B            | 0.69                                      | 237.2                           | 04Aug2013, 18:10    | 169.6                     |
| FSUT1-2D                   | 0.18                                      | 179.6                           | 04Aug2013, 14:35    | 55.4                      |
| FSUT1-2C                   | 0.11                                      | 231.6                           | 04Aug2013, 13:25    | 30.9                      |
| RT FSUT1-2C                | 0.11                                      | 180.4                           | 04Aug2013, 13:35    | 30.5                      |
| ADD FSUT1-2D               | 0.98                                      | 325.9                           | 04Aug2013, 14:15    | 255.6                     |
| RT-FSUT1-2D                | 0.98                                      | 323.6                           | 04Aug2013, 14:40    | 252.6                     |
| FSUT1-2E                   | 0.17                                      | 454.8                           | 04Aug2013, 13:15    | 55.3                      |
| ADD FSUT1-2E               | 1.15                                      | 598.4                           | 04Aug2013, 13:20    | 307.9                     |
| RT FSUT1-2E                | 1.15                                      | 558.2                           | 04Aug2013, 13:25    | 306.7                     |
| FSUT1-2F                   | 0.11                                      | 101                             | 04Aug2013, 14:45    | 33.5                      |
| ADD FSUT1-2F               | 1.26                                      | 590.9                           | 04Aug2013, 13:25    | 340.2                     |
| RT FSUT1-2F                | 1.26                                      | 576.3                           | 04Aug2013, 13:25    | 339.7                     |
| FSUT1-1A                   | 0.40                                      | 149.8                           | 04Aug2013, 19:35    | 100.2                     |
| FSUT1-1B                   | 0.39                                      | 184.3                           | 04Aug2013, 18:05    | 113.7                     |
| RT FSUT1-1A-1B             | 0.80                                      | 324.6                           | 04Aug2013, 18:50    | 209.6                     |
| FSUT1-1C                   | 0.27                                      | 189.9                           | 04Aug2013, 15:40    | 81.8                      |
| U/S Limit FSUT1            | 1.07                                      | 411.6                           | 04Aug2013, 17:55    | 291.5                     |
| FSUT1-2G                   | 0.09                                      | 155.1                           | 04Aug2013, 13:50    | 31.6                      |
| Trafalgar Drive            | 1.16                                      | 425.2                           | 04Aug2013, 17:45    | 321.2                     |
| Corey Road - FSUT1         | 2.41                                      | 788.2                           | 04Aug2013, 16:45    | 659.9                     |
| FSUT1-3                    | 0.19                                      | 158.7                           | 04Aug2013, 14:40    | 48.8                      |
| ADD FSUT1-3                | 2.60                                      | 918.2                           | 04Aug2013, 14:55    | 708.7                     |
| RT FSUT1                   | 2.60                                      | 918.2                           | 04Aug2013, 21:15    | 445.3                     |
| FS-10C                     | 0.10                                      | 89.9                            | 04Aug2013, 14:45    | 29.2                      |
| ADD FSUT1                  | 10.05                                     | 3548.9                          | 04Aug2013, 20:35    | 2623.2                    |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>50-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>  | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FS-10                   | 10.05                                     | 3541.1                          | 04Aug2013, 20:40    | 2612.1                    |
| FS-10D                     | 0.18                                      | 168.7                           | 04Aug2013, 14:50    | 56.1                      |
| FS-10B                     | 0.15                                      | 175.1                           | 04Aug2013, 14:05    | 41.3                      |
| FS-10A                     | 0.03                                      | 43.9                            | 04Aug2013, 14:10    | 11                        |
| RT FS-10A                  | 0.03                                      | 43.5                            | 04Aug2013, 14:30    | 10.9                      |
| ADD FS-10B-10C-10D         | 10.42                                     | 3575.2                          | 04Aug2013, 20:35    | 2720.4                    |
| RT FS-10B-10D              | 10.42                                     | 3570.5                          | 04Aug2013, 20:40    | 2713                      |
| FS-10F                     | 0.15                                      | 233.1                           | 04Aug2013, 13:40    | 40.7                      |
| FS-10E                     | 0.07                                      | 122.6                           | 04Aug2013, 13:35    | 19.5                      |
| ADD FS-10E-10F             | 10.64                                     | 3585.9                          | 04Aug2013, 20:40    | 2773.2                    |
| RT FS-10E-10F              | 10.64                                     | 3570.4                          | 04Aug2013, 20:45    | 2755.9                    |
| OUTLET                     | 10.64                                     | 3570.4                          | 04Aug2013, 20:45    | 2755.9                    |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR ALTERNATIVE</b>  |   |                                 |                     |                           |
|------------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>    | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FSUT3-1A                     | 0.10                                      | 116                             | 04Aug2013, 15:05    | 44.2                      |
| FSUT3-1B                     | 0.10                                      | 169.8                           | 04Aug2013, 13:55    | 36.4                      |
| FSUT3-1C                     | 0.09                                      | 99.6                            | 04Aug2013, 14:35    | 30.7                      |
| ADD FSUT3-1A-1B-1C           | 0.29                                      | 323.3                           | 04Aug2013, 14:10    | 111.3                     |
| FSUT3-1D                     | 0.17                                      | 152.7                           | 04Aug2013, 15:40    | 66.8                      |
| RT FSUT3-1D                  | 0.17                                      | 152.7                           | 04Aug2013, 15:40    | 66.8                      |
| FSUT3-1E                     | 0.04                                      | 97.3                            | 04Aug2013, 13:25    | 13.1                      |
| U/S Limit FSUT3              | 0.49                                      | 438.2                           | 04Aug2013, 14:30    | 191.2                     |
| RT FSUT3-1E                  | 0.49                                      | 437.1                           | 04Aug2013, 14:40    | 190.6                     |
| FSUT3-2A                     | 0.08                                      | 73.9                            | 04Aug2013, 15:10    | 27.4                      |
| ADD FSUT3-2A                 | 0.58                                      | 506.5                           | 04Aug2013, 14:50    | 218                       |
| RT FSUT3-2A                  | 0.58                                      | 505.9                           | 04Aug2013, 14:50    | 217.6                     |
| FSUT3-2B                     | 0.11                                      | 100.3                           | 04Aug2013, 15:10    | 37.3                      |
| ADD FSUT3-2B                 | 0.69                                      | 604.3                           | 04Aug2013, 15:00    | 254.9                     |
| RT FSUT3-2B                  | 0.69                                      | 601.3                           | 04Aug2013, 15:05    | 254                       |
| FSUT3-3                      | 0.09                                      | 287.9                           | 04Aug2013, 13:15    | 35.1                      |
| ADD FSUT3-3                  | 0.78                                      | 631.7                           | 04Aug2013, 15:00    | 289.1                     |
| Coleman Drive                | 0.78                                      | 631.7                           | 04Aug2013, 15:00    | 289.1                     |
| FSUT3-5                      | 0.16                                      | 214.5                           | 04Aug2013, 14:35    | 68.2                      |
| Country Home Road            | 0.16                                      | 214.3                           | 04Aug2013, 14:35    | 68.2                      |
| RT FSUT3-5                   | 0.16                                      | 214.3                           | 04Aug2013, 14:35    | 68.2                      |
| FSUT3-6                      | 0.11                                      | 151.7                           | 04Aug2013, 14:35    | 48.7                      |
| ADD FSUT3-6                  | 0.27                                      | 366                             | 04Aug2013, 14:35    | 116.8                     |
| East Fire Tower Road - North | 0.27                                      | 346.9                           | 04Aug2013, 14:55    | 116.8                     |
| FSUT3-4C                     | 0.13                                      | 105.6                           | 04Aug2013, 16:10    | 51.7                      |
| FSUT3-4B                     | 0.07                                      | 135.1                           | 04Aug2013, 13:55    | 30                        |
| FSUT3-4A                     | 0.07                                      | 53                              | 04Aug2013, 16:15    | 25.9                      |
| ADD FSUT3-4A-4B-4C           | 0.27                                      | 192.3                           | 04Aug2013, 14:00    | 107.6                     |
| RT FSUT3-4C                  | 0.27                                      | 191.7                           | 04Aug2013, 14:10    | 107.2                     |
| FSUT3-4D                     | 0.08                                      | 288.7                           | 04Aug2013, 13:15    | 36                        |
| ADD FSUT3-4D                 | 0.62                                      | 551.7                           | 04Aug2013, 14:50    | 260                       |
| Wimbledon Drive              | 0.62                                      | 551.4                           | 04Aug2013, 14:55    | 259.9                     |
| FSUT3-7                      | 0.14                                      | 115.5                           | 04Aug2013, 16:10    | 56.7                      |
| Tower Pl_Summerhaven Dr      | 0.76                                      | 642.8                           | 04Aug2013, 15:10    | 316.6                     |
| COMBINE FSUT3 (Confluence)   | 1.54                                      | 1273.5                          | 04Aug2013, 15:05    | 605.7                     |
| FSUT3-8                      | 0.08                                      | 153.8                           | 04Aug2013, 13:45    | 28.9                      |
| East Fire Tower - South      | 1.62                                      | 1313.9                          | 04Aug2013, 15:05    | 634.4                     |
| FSUT3-9B                     | 0.16                                      | 104.1                           | 04Aug2013, 17:20    | 59.9                      |
| FSUT3-9A                     | 0.05                                      | 89.5                            | 04Aug2013, 14:05    | 21.8                      |
| RT FSUT3-9A                  | 0.05                                      | 87.6                            | 04Aug2013, 14:15    | 21.6                      |
| ADD FSUT3-9B                 | 0.22                                      | 123.6                           | 04Aug2013, 14:25    | 81.5                      |
| Corey Road - FSUT3           | 0.22                                      | 123.6                           | 04Aug2013, 14:25    | 81.5                      |
| FSUT3-9C                     | 0.16                                      | 138.9                           | 04Aug2013, 15:40    | 60.2                      |
| ADD FSUT3-9C                 | 1.99                                      | 1556.4                          | 04Aug2013, 15:05    | 776.1                     |
| RT FSUT 3-9C                 | 1.99                                      | 1553.8                          | 04Aug2013, 15:10    | 774.7                     |
| FSUT3-9D                     | 0.09                                      | 297                             | 04Aug2013, 13:15    | 36.8                      |
| ADD FSUT3-9D                 | 2.08                                      | 1582.5                          | 04Aug2013, 15:05    | 811.5                     |
| RT FSUT3-9D                  | 2.08                                      | 1579.3                          | 04Aug2013, 15:10    | 809.1                     |
| FSUT3-10A                    | 0.24                                      | 165.3                           | 04Aug2013, 16:45    | 88                        |
| ADD FSUT3-10A                | 2.32                                      | 1702.3                          | 04Aug2013, 15:20    | 897.1                     |
| RT FSUT3-10A                 | 2.32                                      | 1700.2                          | 04Aug2013, 15:25    | 895.4                     |
| FSUT3-10C                    | 0.22                                      | 170.8                           | 04Aug2013, 15:45    | 73.4                      |
| FSUT3-10B                    | 0.09                                      | 299.5                           | 04Aug2013, 13:15    | 37.3                      |
| ADD FSUT3-10B-10C            | 2.63                                      | 1894                            | 04Aug2013, 15:25    | 1006.1                    |
| RT FSUT3                     | 2.63                                      | 1894                            | 04Aug2013, 20:55    | 850.9                     |
| FS-1B                        | 0.13                                      | 170.5                           | 04Aug2013, 14:35    | 53.8                      |



**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|-----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>   | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| FS-1A                       | 0.12                                      | 165.7                           | 04Aug2013, 14:35    | 53.2                      |
| RT FS-1A                    | 0.12                                      | 165.5                           | 04Aug2013, 14:35    | 53.1                      |
| ADD FS-1B                   | 0.25                                      | 336                             | 04Aug2013, 14:35    | 106.9                     |
| RT FS-1B                    | 0.25                                      | 334.2                           | 04Aug2013, 14:40    | 106.7                     |
| FS-2A                       | 0.16                                      | 193.1                           | 04Aug2013, 14:35    | 60                        |
| RT FS-2A                    | 0.16                                      | 192.3                           | 04Aug2013, 14:40    | 59.9                      |
| FS-2B                       | 0.08                                      | 211.3                           | 04Aug2013, 13:25    | 32.4                      |
| ADD FS-2B                   | 0.23                                      | 282.7                           | 04Aug2013, 13:30    | 92.3                      |
| RT FS-2B                    | 0.23                                      | 279.4                           | 04Aug2013, 13:35    | 92.2                      |
| ADD FS1-2                   | 0.48                                      | 567                             | 04Aug2013, 14:35    | 198.8                     |
| FS-3                        | 0.08                                      | 139.5                           | 04Aug2013, 14:05    | 33.7                      |
| East Baywood Lane           | 0.56                                      | 680.5                           | 04Aug2013, 14:30    | 232.3                     |
| U/S Limit FS                | 0.56                                      | 680.5                           | 04Aug2013, 14:30    | 232.3                     |
| FS-4B                       | 0.12                                      | 206                             | 04Aug2013, 14:05    | 50.5                      |
| FS-4A                       | 0.10                                      | 90                              | 04Aug2013, 15:40    | 39.2                      |
| RT FS-4A                    | 0.10                                      | 89.8                            | 04Aug2013, 15:45    | 39.2                      |
| ADD FS-4B                   | 0.22                                      | 248                             | 04Aug2013, 14:10    | 89.7                      |
| RT FS-4B                    | 0.22                                      | 239.9                           | 04Aug2013, 14:15    | 89.3                      |
| Railroad                    | 0.78                                      | 915.6                           | 04Aug2013, 14:25    | 321.5                     |
| FS-5                        | 0.05                                      | 185.1                           | 04Aug2013, 13:15    | 23.7                      |
| Evans Street                | 0.83                                      | 939                             | 04Aug2013, 14:30    | 344.8                     |
| FS-6A                       | 0.16                                      | 155.7                           | 04Aug2013, 15:40    | 68.8                      |
| FS-6B                       | 0.09                                      | 248.9                           | 04Aug2013, 13:25    | 33.8                      |
| RT FS-6A-6B                 | 0.25                                      | 284.8                           | 04Aug2013, 13:30    | 102.3                     |
| FS-6E                       | 0.11                                      | 92.6                            | 04Aug2013, 15:40    | 40.1                      |
| FS-6D                       | 0.10                                      | 100.7                           | 04Aug2013, 15:10    | 37.8                      |
| ADD FS-6D-6E                | 0.20                                      | 189.9                           | 04Aug2013, 15:20    | 77.9                      |
| FS-6C                       | 0.15                                      | 195.1                           | 04Aug2013, 14:35    | 61.1                      |
| ADD FS-6C                   | 1.44                                      | 1444.3                          | 04Aug2013, 14:35    | 586.1                     |
| FS-6F                       | 0.17                                      | 106.3                           | 04Aug2013, 17:20    | 61.3                      |
| ADD FS-6F                   | 1.60                                      | 1490.2                          | 04Aug2013, 14:40    | 647.4                     |
| RT FS-6F                    | 1.60                                      | 1476.8                          | 04Aug2013, 14:45    | 645.2                     |
| FS-7A                       | 0.15                                      | 488.6                           | 04Aug2013, 13:15    | 60.1                      |
| ADD FS-7A                   | 1.75                                      | 1534                            | 04Aug2013, 14:40    | 705.4                     |
| RT FS-7A                    | 1.75                                      | 1532.7                          | 04Aug2013, 14:45    | 704.6                     |
| FS-7B                       | 0.15                                      | 187.9                           | 04Aug2013, 14:35    | 58.4                      |
| ADD FS-7B                   | 1.90                                      | 1718.2                          | 04Aug2013, 14:45    | 763                       |
| E Fire Tower Road (Bridge)  | 1.90                                      | 1718.2                          | 04Aug2013, 14:45    | 763                       |
| RT FS-7B                    | 1.90                                      | 1709.2                          | 04Aug2013, 14:45    | 760.9                     |
| FS-8E                       | 0.12                                      | 241.3                           | 04Aug2013, 13:40    | 41.3                      |
| ADD FS8-E                   | 2.03                                      | 1776.7                          | 04Aug2013, 14:40    | 802.2                     |
| RT FS-8E                    | 2.03                                      | 1775.9                          | 04Aug2013, 14:45    | 801.5                     |
| FS-8B                       | 0.13                                      | 127.2                           | 04Aug2013, 15:00    | 44.7                      |
| FS-8C                       | 0.09                                      | 229.9                           | 04Aug2013, 13:35    | 37.7                      |
| FS-8A                       | 0.06                                      | 47.6                            | 04Aug2013, 16:15    | 23                        |
| ADD FS-8A-8B-8C             | 0.28                                      | 287.9                           | 04Aug2013, 13:35    | 105.5                     |
| RT FS-8C                    | 0.28                                      | 285.6                           | 04Aug2013, 13:40    | 105.3                     |
| FS-8D                       | 0.07                                      | 202.3                           | 04Aug2013, 13:15    | 24.5                      |
| ADD FS-8D                   | 2.38                                      | 2011                            | 04Aug2013, 13:45    | 931.2                     |
| ADD FSUT3 to FS             | 5.01                                      | 2245.6                          | 04Aug2013, 20:45    | 1782                      |
| FS-9                        | 0.14                                      | 200.7                           | 04Aug2013, 14:05    | 47.6                      |
| ADD FS-9                    | 5.15                                      | 2258.3                          | 04Aug2013, 20:45    | 1829.6                    |
| RT FS-9                     | 5.15                                      | 2256.1                          | 04Aug2013, 20:45    | 1824.6                    |
| FSUT2-3                     | 0.21                                      | 131.7                           | 04Aug2013, 17:20    | 75.5                      |
| FSUT2-1                     | 0.14                                      | 232.4                           | 04Aug2013, 14:00    | 52.9                      |
| U/S Limit FSUT2-2           | 0.14                                      | 232.4                           | 04Aug2013, 14:00    | 52.9                      |

**City of Greenville - Fork Swamp Watershed Master Plan - HMS Output**

| <b>100-YEAR ALTERNATIVE</b> |   |                                 |                     |                           |
|-----------------------------|---|---------------------------------|---------------------|---------------------------|
| <b>Hydrologic Element</b>   | <b>Drainage Area<br/>(mi<sup>2</sup>)</b> | <b>Peak Discharge<br/>(CFS)</b> | <b>Time of Peak</b> | <b>Volume<br/>(AC-FT)</b> |
| RT FSUT2-1                  | 0.14                                      | 225.1                           | 04Aug2013, 14:05    | 52.7                      |
| FSUT2-2                     | 0.03                                      | 100.3                           | 04Aug2013, 13:15    | 12.3                      |
| ADD FSUT2-2                 | 0.17                                      | 246.6                           | 04Aug2013, 14:00    | 65                        |
| RT FSUT2-2                  | 0.17                                      | 245.4                           | 04Aug2013, 14:05    | 64.9                      |
| ADD FSUT2-3                 | 0.38                                      | 280.9                           | 04Aug2013, 14:05    | 140.4                     |
| RT FSUT2-3                  | 0.38                                      | 280.6                           | 04Aug2013, 14:10    | 140.3                     |
| FSUT2-4                     | 0.14                                      | 133.7                           | 04Aug2013, 15:40    | 59.8                      |
| ADD FSUT2-4                 | 0.52                                      | 359.4                           | 04Aug2013, 14:20    | 200                       |
| RT FSUT2-4                  | 0.52                                      | 358.1                           | 04Aug2013, 14:25    | 199.5                     |
| FSUT2-5                     | 0.21                                      | 161.6                           | 04Aug2013, 16:45    | 87.8                      |
| West Fire Tower Rd          | 0.73                                      | 464.7                           | 04Aug2013, 16:10    | 286.9                     |
| D/S Limit FSUT2-2           | 0.73                                      | 464.7                           | 04Aug2013, 16:10    | 286.9                     |
| FSUT2-6                     | 0.31                                      | 215.4                           | 04Aug2013, 17:15    | 126                       |
| ADD FSUT2-6                 | 1.05                                      | 668.4                           | 04Aug2013, 16:35    | 412.9                     |
| RT FSUT2-6                  | 1.05                                      | 667.7                           | 04Aug2013, 16:40    | 410.9                     |
| FSUT2-7A                    | 0.19                                      | 131.5                           | 04Aug2013, 16:45    | 70                        |
| ADD FSUT2-7A                | 1.24                                      | 799.1                           | 04Aug2013, 16:45    | 480.9                     |
| RT FSUT2-7A                 | 1.24                                      | 798.2                           | 04Aug2013, 16:50    | 479.1                     |
| FSUT2-7B                    | 0.42                                      | 214.7                           | 04Aug2013, 18:30    | 136.3                     |
| ADD FSUT2-7B                | 1.66                                      | 985.1                           | 04Aug2013, 17:05    | 615.4                     |
| FSUT2-8A                    | 0.27                                      | 236.6                           | 04Aug2013, 15:40    | 102.5                     |
| FSUT2-8B                    | 0.06                                      | 189.1                           | 04Aug2013, 13:15    | 23.3                      |
| U/S Limit FSUT2-1           | 1.99                                      | 1184.7                          | 04Aug2013, 16:40    | 741.2                     |
| RT FSUT2-8A-8B              | 1.99                                      | 1184                            | 04Aug2013, 16:45    | 739.1                     |
| FSUT2-9B                    | 0.11                                      | 154.7                           | 04Aug2013, 14:20    | 42.6                      |
| FSUT2-9A                    | 0.10                                      | 305.1                           | 04Aug2013, 13:15    | 37.1                      |
| ADD FSUT2-9A-9B             | 2.20                                      | 1246.4                          | 04Aug2013, 16:35    | 818.9                     |
| RT FSUT2-9A-9B              | 2.20                                      | 1246.4                          | 04Aug2013, 18:05    | 785.1                     |
| ADD FSUT2                   | 7.35                                      | 3235.5                          | 04Aug2013, 19:10    | 2609.7                    |
| FSUT1-2A                    | 0.45                                      | 177.9                           | 04Aug2013, 20:20    | 120.7                     |
| FSUT1-2B                    | 0.24                                      | 162                             | 04Aug2013, 16:55    | 87.5                      |
| ADD FSUT1-2A-2B             | 0.69                                      | 290.2                           | 04Aug2013, 18:05    | 208.3                     |
| FSUT1-2D                    | 0.18                                      | 217.9                           | 04Aug2013, 14:35    | 67.5                      |
| FSUT1-2C                    | 0.11                                      | 285.2                           | 04Aug2013, 13:25    | 38.3                      |
| RT FSUT1-2C                 | 0.11                                      | 224.7                           | 04Aug2013, 13:35    | 37.8                      |
| ADD FSUT1-2D                | 0.98                                      | 398.7                           | 04Aug2013, 14:10    | 313.6                     |
| RT-FSUT1-2D                 | 0.98                                      | 395.7                           | 04Aug2013, 14:40    | 310.2                     |
| FSUT1-2E                    | 0.17                                      | 548.9                           | 04Aug2013, 13:15    | 67.1                      |
| ADD FSUT1-2E                | 1.15                                      | 742.8                           | 04Aug2013, 13:20    | 377.3                     |
| RT FSUT1-2E                 | 1.15                                      | 693.1                           | 04Aug2013, 13:25    | 376                       |
| FSUT1-2F                    | 0.11                                      | 122.2                           | 04Aug2013, 14:45    | 40.7                      |
| ADD FSUT1-2F                | 1.26                                      | 734                             | 04Aug2013, 13:25    | 416.7                     |
| RT FSUT1-2F                 | 1.26                                      | 717.3                           | 04Aug2013, 13:25    | 416                       |
| FSUT1-1A                    | 0.40                                      | 182.3                           | 04Aug2013, 19:35    | 122.6                     |
| FSUT1-1B                    | 0.39                                      | 222.8                           | 04Aug2013, 18:05    | 138.2                     |
| RT FSUT1-1A-1B              | 0.80                                      | 393.9                           | 04Aug2013, 18:50    | 256                       |
| FSUT1-1C                    | 0.27                                      | 230.6                           | 04Aug2013, 15:40    | 99.7                      |
| U/S Limit FSUT1             | 1.07                                      | 500.2                           | 04Aug2013, 17:45    | 355.7                     |
| FSUT1-2G                    | 0.09                                      | 185                             | 04Aug2013, 13:50    | 38                        |
| Trafalgar Drive             | 1.16                                      | 517                             | 04Aug2013, 17:35    | 391.5                     |
| Corey Road - FSUT1          | 2.41                                      | 962                             | 04Aug2013, 16:40    | 806.4                     |
| FSUT1-3                     | 0.19                                      | 197.7                           | 04Aug2013, 14:40    | 60.8                      |
| ADD FSUT1-3                 | 2.60                                      | 1130.8                          | 04Aug2013, 14:55    | 867.2                     |
| RT FSUT1                    | 2.60                                      | 1130.8                          | 04Aug2013, 21:15    | 550.5                     |
| FS-10C                      | 0.10                                      | 110.5                           | 04Aug2013, 14:45    | 35.9                      |
| ADD FSUT1                   | 10.05                                     | 4285.3                          | 04Aug2013, 20:35    | 3196.1                    |

City of Greenville - Fork Swamp Watershed Master Plan - HMS Output

| 100-YEAR ALTERNATIVE |                                     |                         |                  |                   |
|----------------------|-------------------------------------|-------------------------|------------------|-------------------|
| Hydrologic Element   | Drainage Area<br>(mi <sup>2</sup> ) | Peak Discharge<br>(CFS) | Time of Peak     | Volume<br>(AC-FT) |
| RT FS-10             | 10.05                               | 4277.7                  | 04Aug2013, 20:40 | 3183.4            |
| FS-10D               | 0.18                                | 204.6                   | 04Aug2013, 14:45 | 68.3              |
| FS-10B               | 0.15                                | 217.2                   | 04Aug2013, 14:05 | 51.3              |
| FS-10A               | 0.03                                | 52.9                    | 04Aug2013, 14:10 | 13.3              |
| RT FS-10A            | 0.03                                | 52.4                    | 04Aug2013, 14:25 | 13.2              |
| ADD FS-10B-10C-10D   | 10.42                               | 4317.6                  | 04Aug2013, 20:40 | 3316.1            |
| RT FS-10B-10D        | 10.42                               | 4312.8                  | 04Aug2013, 20:40 | 3307.7            |
| FS-10F               | 0.15                                | 289.8                   | 04Aug2013, 13:40 | 50.7              |
| FS-10E               | 0.07                                | 149.5                   | 04Aug2013, 13:35 | 23.9              |
| ADD FS-10E-10F       | 10.64                               | 4331.2                  | 04Aug2013, 20:40 | 3382.3            |
| RT FS-10E-10F        | 10.64                               | 4313.2                  | 04Aug2013, 20:45 | 3362.6            |
| OUTLET               | 10.64                               | 4313.2                  | 04Aug2013, 20:45 | 3362.6            |

**PRIMARY SYSTEM  
EXISTING CONDITIONS:  
HEC-RAS OUTPUT**

# FORK SWAMP MAIN BRANCH: EXISTING CONDITIONS

HEC-RAS Plan: Fork Swamp - Ex River: Fork Swamp Reach: Upper Reach

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 40427.0   | 2-YEAR   | 974.00           | 39.01             | 46.35             | 43.31             | 46.71             | 0.003700              | 4.81               | 218.11               | 124.48            | 0.36         |
| Upper Reach | 40427.0   | 10-YEAR  | 1958.00          | 39.01             | 48.23             | 45.23             | 48.65             | 0.003706              | 5.81               | 1427.08              | 954.28            | 0.38         |
| Upper Reach | 40427.0   | 25-YEAR  | 2669.00          | 39.01             | 49.01             | 46.34             | 49.42             | 0.003706              | 6.21               | 2251.65              | 1387.79           | 0.38         |
| Upper Reach | 40427.0   | 50-YEAR  | 3326.00          | 39.01             | 49.55             | 48.23             | 49.95             | 0.003703              | 6.48               | 3083.40              | 1620.93           | 0.39         |
| Upper Reach | 40427.0   | 100-YEAR | 4068.00          | 39.01             | 50.03             | 48.69             | 50.42             | 0.003704              | 6.72               | 3891.88              | 1720.35           | 0.39         |
| Upper Reach | 41233.0   | 2-YEAR   | 974.00           | 39.95             | 48.24             | 45.68             | 48.30             | 0.001183              | 2.85               | 1804.89              | 1493.23           | 0.21         |
| Upper Reach | 41233.0   | 10-YEAR  | 1958.00          | 39.95             | 49.67             | 47.92             | 49.70             | 0.000616              | 2.38               | 4195.56              | 1880.74           | 0.16         |
| Upper Reach | 41233.0   | 25-YEAR  | 2669.00          | 39.95             | 50.37             | 48.18             | 50.39             | 0.000553              | 2.40               | 5404.61              | 1978.49           | 0.15         |
| Upper Reach | 41233.0   | 50-YEAR  | 3326.00          | 39.95             | 50.88             | 48.40             | 50.90             | 0.000541              | 2.48               | 6319.80              | 2019.79           | 0.15         |
| Upper Reach | 41233.0   | 100-YEAR | 4068.00          | 39.95             | 51.36             | 48.58             | 51.38             | 0.000552              | 2.59               | 7179.86              | 2058.12           | 0.15         |
| Upper Reach | 41704.5   | 2-YEAR   | 974.00           | 40.50             | 48.82             |                   | 48.89             | 0.001316              | 3.02               | 1353.44              | 833.66            | 0.22         |
| Upper Reach | 41704.5   | 10-YEAR  | 1958.00          | 40.50             | 50.05             |                   | 50.11             | 0.001230              | 3.31               | 2699.58              | 1291.30           | 0.22         |
| Upper Reach | 41704.5   | 25-YEAR  | 2669.00          | 40.50             | 50.70             |                   | 50.76             | 0.001130              | 3.37               | 3574.33              | 1366.40           | 0.21         |
| Upper Reach | 41704.5   | 50-YEAR  | 3326.00          | 40.50             | 51.21             |                   | 51.26             | 0.001079              | 3.44               | 4278.66              | 1415.51           | 0.21         |
| Upper Reach | 41704.5   | 100-YEAR | 4068.00          | 40.50             | 51.70             |                   | 51.74             | 0.001083              | 3.58               | 4985.36              | 1502.15           | 0.21         |
| Upper Reach | 42742.0   | 2-YEAR   | 963.00           | 40.98             | 49.94             |                   | 49.99             | 0.000875              | 2.64               | 1615.84              | 964.68            | 0.18         |
| Upper Reach | 42742.0   | 10-YEAR  | 1937.00          | 40.98             | 51.16             |                   | 51.21             | 0.000928              | 3.05               | 2898.88              | 1089.31           | 0.19         |
| Upper Reach | 42742.0   | 25-YEAR  | 2637.00          | 40.98             | 51.79             |                   | 51.84             | 0.000971              | 3.29               | 3595.52              | 1118.13           | 0.20         |
| Upper Reach | 42742.0   | 50-YEAR  | 3288.00          | 40.98             | 52.29             |                   | 52.35             | 0.001009              | 3.48               | 4163.68              | 1141.09           | 0.21         |
| Upper Reach | 42742.0   | 100-YEAR | 4025.00          | 40.98             | 52.80             |                   | 52.85             | 0.001050              | 3.69               | 4744.02              | 1164.10           | 0.21         |
| Upper Reach | 43230.0   | 2-YEAR   | 963.00           | 41.20             | 50.28             |                   | 50.31             | 0.000482              | 1.98               | 2553.92              | 1475.43           | 0.14         |
| Upper Reach | 43230.0   | 10-YEAR  | 1937.00          | 41.20             | 51.51             |                   | 51.53             | 0.000466              | 2.18               | 4435.33              | 1595.40           | 0.14         |
| Upper Reach | 43230.0   | 25-YEAR  | 2637.00          | 41.20             | 52.15             |                   | 52.17             | 0.000472              | 2.32               | 5464.69              | 1617.49           | 0.14         |
| Upper Reach | 43230.0   | 50-YEAR  | 3288.00          | 41.20             | 52.66             |                   | 52.68             | 0.000482              | 2.43               | 6300.05              | 1635.20           | 0.14         |
| Upper Reach | 43230.0   | 100-YEAR | 4025.00          | 41.20             | 53.18             |                   | 53.20             | 0.000495              | 2.56               | 7148.19              | 1652.99           | 0.15         |
| Upper Reach | 43829.0   | 2-YEAR   | 757.00           | 41.48             | 50.44             |                   | 50.45             | 0.000119              | 0.97               | 3178.19              | 1284.88           | 0.07         |
| Upper Reach | 43829.0   | 10-YEAR  | 1477.00          | 41.48             | 51.67             |                   | 51.68             | 0.000136              | 1.17               | 4799.76              | 1340.30           | 0.07         |
| Upper Reach | 43829.0   | 25-YEAR  | 2003.00          | 41.48             | 52.32             |                   | 52.33             | 0.000152              | 1.30               | 5678.27              | 1365.26           | 0.08         |
| Upper Reach | 43829.0   | 50-YEAR  | 2486.00          | 41.48             | 52.84             |                   | 52.85             | 0.000164              | 1.41               | 6398.74              | 1392.87           | 0.08         |
| Upper Reach | 43829.0   | 100-YEAR | 3052.00          | 41.48             | 53.37             |                   | 53.38             | 0.000179              | 1.53               | 7138.89              | 1420.67           | 0.09         |
| Upper Reach | 44420.0   | 2-YEAR   | 757.00           | 42.46             | 50.52             |                   | 50.52             | 0.000145              | 1.08               | 3078.11              | 1288.61           | 0.07         |
| Upper Reach | 44420.0   | 10-YEAR  | 1477.00          | 42.46             | 51.76             |                   | 51.76             | 0.000160              | 1.26               | 4749.76              | 1407.60           | 0.08         |
| Upper Reach | 44420.0   | 25-YEAR  | 2003.00          | 42.46             | 52.42             |                   | 52.42             | 0.000172              | 1.37               | 5692.61              | 1453.41           | 0.08         |

# FORK SWAMP MAIN BRANCH: EXISTING CONDITIONS

HEC-RAS Plan: Fork Swamp - Ex River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 44420.0   | 50-YEAR  | 2486.00          | 42.46             | 52.95             |                   | 52.95             | 0.000181              | 1.46               | 6471.27              | 1489.08           | 0.08         |
| Upper Reach | 44420.0   | 100-YEAR | 3052.00          | 42.46             | 53.48             |                   | 53.49             | 0.000193              | 1.57               | 7276.59              | 1525.11           | 0.09         |
| Upper Reach | 45322.0   | 2-YEAR   | 538.00           | 43.50             | 50.69             |                   | 50.71             | 0.000351              | 1.54               | 1881.53              | 1555.63           | 0.11         |
| Upper Reach | 45322.0   | 10-YEAR  | 1055.00          | 43.50             | 51.91             |                   | 51.92             | 0.000192              | 1.28               | 3869.55              | 1675.99           | 0.08         |
| Upper Reach | 45322.0   | 25-YEAR  | 1414.00          | 43.50             | 52.57             |                   | 52.57             | 0.000162              | 1.24               | 4979.58              | 1707.73           | 0.08         |
| Upper Reach | 45322.0   | 50-YEAR  | 1756.00          | 43.50             | 53.10             |                   | 53.10             | 0.000151              | 1.25               | 5892.52              | 1736.82           | 0.07         |
| Upper Reach | 45322.0   | 100-YEAR | 2122.00          | 43.50             | 53.64             |                   | 53.64             | 0.000140              | 1.25               | 6827.94              | 1756.97           | 0.07         |
| Upper Reach | 46097.8   | 2-YEAR   | 538.00           | 44.33             | 51.00             |                   | 51.01             | 0.000433              | 1.61               | 1554.86              | 1154.74           | 0.12         |
| Upper Reach | 46097.8   | 10-YEAR  | 1055.00          | 44.33             | 52.10             |                   | 52.11             | 0.000318              | 1.55               | 2959.48              | 1356.50           | 0.10         |
| Upper Reach | 46097.8   | 25-YEAR  | 1414.00          | 44.33             | 52.73             |                   | 52.74             | 0.000276              | 1.53               | 3828.94              | 1408.02           | 0.10         |
| Upper Reach | 46097.8   | 50-YEAR  | 1756.00          | 44.33             | 53.25             |                   | 53.25             | 0.000256              | 1.54               | 4569.28              | 1450.46           | 0.10         |
| Upper Reach | 46097.8   | 100-YEAR | 2122.00          | 44.33             | 53.77             |                   | 53.78             | 0.000240              | 1.56               | 5344.13              | 1504.49           | 0.09         |
| Upper Reach | 46863.0   | 2-YEAR   | 538.00           | 44.76             | 51.29             |                   | 51.29             | 0.000322              | 1.36               | 2025.26              | 1563.37           | 0.10         |
| Upper Reach | 46863.0   | 10-YEAR  | 1055.00          | 44.76             | 52.31             |                   | 52.31             | 0.000228              | 1.28               | 3679.69              | 1648.93           | 0.09         |
| Upper Reach | 46863.0   | 25-YEAR  | 1414.00          | 44.76             | 52.91             |                   | 52.91             | 0.000198              | 1.27               | 4679.76              | 1678.09           | 0.08         |
| Upper Reach | 46863.0   | 50-YEAR  | 1756.00          | 44.76             | 53.41             |                   | 53.42             | 0.000183              | 1.27               | 5532.38              | 1708.71           | 0.08         |
| Upper Reach | 46863.0   | 100-YEAR | 2122.00          | 44.76             | 53.93             |                   | 53.93             | 0.000169              | 1.28               | 6424.46              | 1755.39           | 0.08         |
| Upper Reach | 47656.0   | 2-YEAR   | 447.00           | 45.21             | 51.67             |                   | 51.75             | 0.001346              | 2.77               | 602.34               | 707.03            | 0.21         |
| Upper Reach | 47656.0   | 10-YEAR  | 867.00           | 45.21             | 52.60             |                   | 52.65             | 0.001102              | 2.78               | 1411.70              | 956.74            | 0.19         |
| Upper Reach | 47656.0   | 25-YEAR  | 1172.00          | 45.21             | 53.16             |                   | 53.20             | 0.000893              | 2.64               | 1961.72              | 997.32            | 0.18         |
| Upper Reach | 47656.0   | 50-YEAR  | 1440.00          | 45.21             | 53.64             |                   | 53.67             | 0.000751              | 2.53               | 2449.81              | 1036.83           | 0.16         |
| Upper Reach | 47656.0   | 100-YEAR | 1738.00          | 45.21             | 54.14             |                   | 54.16             | 0.000653              | 2.47               | 2977.79              | 1089.46           | 0.15         |
| Upper Reach | 48173.0   | 2-YEAR   | 447.00           | 45.55             | 52.36             |                   | 52.43             | 0.001297              | 2.40               | 438.26               | 597.44            | 0.21         |
| Upper Reach | 48173.0   | 10-YEAR  | 867.00           | 45.55             | 53.20             |                   | 53.26             | 0.001279              | 2.71               | 993.38               | 684.30            | 0.22         |
| Upper Reach | 48173.0   | 25-YEAR  | 1172.00          | 45.55             | 53.68             |                   | 53.74             | 0.001225              | 2.82               | 1329.20              | 711.42            | 0.22         |
| Upper Reach | 48173.0   | 50-YEAR  | 1440.00          | 45.55             | 54.09             |                   | 54.15             | 0.001131              | 2.85               | 1627.26              | 730.34            | 0.21         |
| Upper Reach | 48173.0   | 100-YEAR | 1738.00          | 45.55             | 54.53             |                   | 54.59             | 0.001031              | 2.86               | 1954.65              | 749.66            | 0.20         |
| Upper Reach | 48793.0   | 2-YEAR   | 447.00           | 45.95             | 53.10             |                   | 53.18             | 0.001122              | 2.36               | 354.59               | 280.53            | 0.20         |
| Upper Reach | 48793.0   | 10-YEAR  | 867.00           | 45.95             | 54.03             |                   | 54.14             | 0.001508              | 3.11               | 697.60               | 439.48            | 0.24         |
| Upper Reach | 48793.0   | 25-YEAR  | 1172.00          | 45.95             | 54.51             |                   | 54.63             | 0.001629              | 3.43               | 915.44               | 465.27            | 0.25         |
| Upper Reach | 48793.0   | 50-YEAR  | 1440.00          | 45.95             | 54.89             |                   | 55.02             | 0.001677              | 3.63               | 1096.92              | 488.41            | 0.26         |
| Upper Reach | 48793.0   | 100-YEAR | 1738.00          | 45.95             | 55.29             |                   | 55.41             | 0.001685              | 3.80               | 1295.83              | 519.44            | 0.26         |

# FORK SWAMP MAIN BRANCH: EXISTING CONDITIONS

HEC-RAS Plan: Fork Swamp - Ex River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 49296     | 2-YEAR   | 438.00           | 47.66             | 54.02             |                   | 54.22             | 0.004653              | 4.22               | 273.48               | 312.16            | 0.36         |
| Upper Reach | 49296     | 10-YEAR  | 844.00           | 47.66             | 55.09             |                   | 55.21             | 0.003279              | 4.04               | 672.86               | 419.21            | 0.31         |
| Upper Reach | 49296     | 25-YEAR  | 1138.00          | 47.66             | 55.61             |                   | 55.72             | 0.003057              | 4.15               | 900.77               | 461.96            | 0.30         |
| Upper Reach | 49296     | 50-YEAR  | 1395.00          | 47.66             | 56.00             |                   | 56.11             | 0.002944              | 4.25               | 1089.13              | 498.08            | 0.30         |
| Upper Reach | 49296     | 100-YEAR | 1681.00          | 47.66             | 56.39             |                   | 56.49             | 0.002814              | 4.33               | 1286.38              | 520.64            | 0.30         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 49788.0   | 2-YEAR   | 438.00           | 47.04             | 54.85             |                   | 54.90             | 0.000628              | 1.94               | 490.16               | 480.41            | 0.15         |
| Upper Reach | 49788.0   | 10-YEAR  | 844.00           | 47.04             | 55.84             |                   | 55.89             | 0.000746              | 2.39               | 992.92               | 540.00            | 0.17         |
| Upper Reach | 49788.0   | 25-YEAR  | 1138.00          | 47.04             | 56.35             |                   | 56.41             | 0.000791              | 2.60               | 1278.32              | 570.98            | 0.18         |
| Upper Reach | 49788.0   | 50-YEAR  | 1395.00          | 47.04             | 56.74             |                   | 56.80             | 0.000816              | 2.74               | 1505.67              | 592.72            | 0.18         |
| Upper Reach | 49788.0   | 100-YEAR | 1681.00          | 47.04             | 57.12             |                   | 57.19             | 0.000842              | 2.89               | 1734.10              | 601.98            | 0.19         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50078     | 2-YEAR   | 438.00           | 47.75             | 55.10             |                   | 55.28             | 0.002984              | 3.44               | 127.37               | 30.75             | 0.30         |
| Upper Reach | 50078     | 10-YEAR  | 844.00           | 47.75             | 56.10             | 53.46             | 56.40             | 0.004311              | 4.62               | 392.96               | 616.46            | 0.37         |
| Upper Reach | 50078     | 25-YEAR  | 1138.00          | 47.75             | 56.67             |                   | 56.86             | 0.003179              | 4.27               | 747.65               | 645.12            | 0.32         |
| Upper Reach | 50078     | 50-YEAR  | 1395.00          | 47.75             | 57.07             |                   | 57.22             | 0.002618              | 4.06               | 1012.90              | 669.34            | 0.29         |
| Upper Reach | 50078     | 100-YEAR | 1681.00          | 47.75             | 57.46             |                   | 57.58             | 0.002257              | 3.93               | 1277.96              | 693.58            | 0.28         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50144.8   | 2-YEAR   | 438.00           | 47.85             | 55.34             | 51.75             | 55.42             | 0.001030              | 2.38               | 196.51               | 138.35            | 0.19         |
| Upper Reach | 50144.8   | 10-YEAR  | 844.00           | 47.85             | 56.40             | 52.99             | 56.60             | 0.001854              | 3.66               | 249.89               | 236.86            | 0.27         |
| Upper Reach | 50144.8   | 25-YEAR  | 1138.00          | 47.85             | 56.80             | 53.67             | 57.11             | 0.002664              | 4.59               | 269.74               | 335.63            | 0.33         |
| Upper Reach | 50144.8   | 50-YEAR  | 1395.00          | 47.85             | 57.19             | 54.19             | 57.40             | 0.002004              | 4.15               | 733.90               | 499.59            | 0.29         |
| Upper Reach | 50144.8   | 100-YEAR | 1681.00          | 47.85             | 57.56             | 54.66             | 57.77             | 0.002046              | 4.34               | 939.71               | 617.27            | 0.29         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50167.8   |          | Bridge           |                   |                   |                   |                   |                       |                    |                      |                   |              |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50190.8   | 2-YEAR   | 438.00           | 47.99             | 55.49             | 51.89             | 55.57             | 0.001022              | 2.37               | 197.04               | 138.85            | 0.19         |
| Upper Reach | 50190.8   | 10-YEAR  | 844.00           | 47.99             | 57.02             | 53.13             | 57.19             | 0.001401              | 3.35               | 273.73               | 392.69            | 0.24         |
| Upper Reach | 50190.8   | 25-YEAR  | 1138.00          | 47.99             | 57.35             | 53.81             | 57.62             | 0.002128              | 4.28               | 290.03               | 503.55            | 0.30         |
| Upper Reach | 50190.8   | 50-YEAR  | 1395.00          | 47.99             | 58.33             | 54.33             | 58.39             | 0.000730              | 2.75               | 1360.71              | 712.28            | 0.18         |
| Upper Reach | 50190.8   | 100-YEAR | 1681.00          | 47.99             | 58.68             | 54.80             | 58.75             | 0.000722              | 2.82               | 1622.89              | 755.36            | 0.18         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50286.0   | 2-YEAR   | 403.00           | 48.25             | 55.62             |                   | 55.66             | 0.000666              | 1.88               | 421.23               | 401.46            | 0.16         |
| Upper Reach | 50286.0   | 10-YEAR  | 766.00           | 48.25             | 57.27             |                   | 57.29             | 0.000322              | 1.61               | 1176.71              | 541.13            | 0.11         |
| Upper Reach | 50286.0   | 25-YEAR  | 1029.00          | 48.25             | 57.74             |                   | 57.76             | 0.000369              | 1.81               | 1448.19              | 608.72            | 0.12         |
| Upper Reach | 50286.0   | 50-YEAR  | 1257.00          | 48.25             | 58.43             |                   | 58.45             | 0.000296              | 1.73               | 1904.95              | 708.01            | 0.11         |
| Upper Reach | 50286.0   | 100-YEAR | 1511.00          | 48.25             | 58.79             |                   | 58.81             | 0.000312              | 1.83               | 2163.63              | 758.45            | 0.12         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50622     | 2-YEAR   | 403.00           | 48.89             | 55.89             |                   | 55.95             | 0.001108              | 2.49               | 465.55               | 345.88            | 0.19         |

# FORK SWAMP MAIN BRANCH: EXISTING CONDITIONS

HEC-RAS Plan: Fork Swamp - Ex River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 50622     | 10-YEAR  | 766.00           | 48.89             | 57.41             |                   | 57.44             | 0.000609              | 2.17               | 1116.16              | 504.25            | 0.14         |
| Upper Reach | 50622     | 25-YEAR  | 1029.00          | 48.89             | 57.90             |                   | 57.93             | 0.000662              | 2.36               | 1375.55              | 552.46            | 0.15         |
| Upper Reach | 50622     | 50-YEAR  | 1257.00          | 48.89             | 58.56             |                   | 58.58             | 0.000527              | 2.23               | 1759.06              | 603.68            | 0.14         |
| Upper Reach | 50622     | 100-YEAR | 1511.00          | 48.89             | 58.92             |                   | 58.95             | 0.000557              | 2.36               | 1981.02              | 630.29            | 0.14         |
| Upper Reach | 51042     | 2-YEAR   | 403.00           | 49.51             | 56.39             |                   | 56.45             | 0.001283              | 2.37               | 436.79               | 490.56            | 0.20         |
| Upper Reach | 51042     | 10-YEAR  | 766.00           | 49.51             | 57.67             |                   | 57.70             | 0.000634              | 1.97               | 1216.30              | 700.90            | 0.15         |
| Upper Reach | 51042     | 25-YEAR  | 1029.00          | 49.51             | 58.17             |                   | 58.19             | 0.000592              | 2.01               | 1574.77              | 734.86            | 0.14         |
| Upper Reach | 51042     | 50-YEAR  | 1257.00          | 49.51             | 58.77             |                   | 58.79             | 0.000443              | 1.86               | 2026.07              | 766.29            | 0.13         |
| Upper Reach | 51042     | 100-YEAR | 1511.00          | 49.51             | 59.14             |                   | 59.15             | 0.000442              | 1.92               | 2310.50              | 785.64            | 0.13         |
| Upper Reach | 51532.0   | 2-YEAR   | 403.00           | 50.48             | 57.04             |                   | 57.11             | 0.001412              | 2.40               | 334.49               | 332.26            | 0.22         |
| Upper Reach | 51532.0   | 10-YEAR  | 766.00           | 50.48             | 58.07             |                   | 58.15             | 0.001317              | 2.73               | 720.04               | 432.91            | 0.22         |
| Upper Reach | 51532.0   | 25-YEAR  | 1029.00          | 50.48             | 58.55             |                   | 58.63             | 0.001379              | 2.97               | 956.94               | 620.97            | 0.23         |
| Upper Reach | 51532.0   | 50-YEAR  | 1257.00          | 50.48             | 59.06             |                   | 59.14             | 0.001164              | 2.91               | 1358.18              | 888.82            | 0.21         |
| Upper Reach | 51532.0   | 100-YEAR | 1511.00          | 50.48             | 59.43             |                   | 59.49             | 0.001107              | 2.96               | 1693.80              | 944.07            | 0.21         |
| Upper Reach | 52049.0   | 2-YEAR   | 382.00           | 50.64             | 57.67             |                   | 57.74             | 0.001058              | 2.25               | 256.65               | 292.92            | 0.19         |
| Upper Reach | 52049.0   | 10-YEAR  | 726.00           | 50.64             | 58.70             |                   | 58.78             | 0.001145              | 2.71               | 744.14               | 656.30            | 0.21         |
| Upper Reach | 52049.0   | 25-YEAR  | 973.00           | 50.64             | 59.19             |                   | 59.27             | 0.001107              | 2.83               | 1089.83              | 762.38            | 0.21         |
| Upper Reach | 52049.0   | 50-YEAR  | 1186.00          | 50.64             | 59.62             |                   | 59.69             | 0.000974              | 2.78               | 1428.10              | 819.18            | 0.20         |
| Upper Reach | 52049.0   | 100-YEAR | 1425.00          | 50.64             | 59.96             |                   | 60.03             | 0.000952              | 2.85               | 1715.12              | 860.04            | 0.20         |
| Upper Reach | 52380     | 2-YEAR   | 382.00           | 50.74             | 57.98             |                   | 58.06             | 0.000855              | 2.38               | 221.91               | 308.36            | 0.20         |
| Upper Reach | 52380     | 10-YEAR  | 726.00           | 50.74             | 59.02             |                   | 59.10             | 0.000828              | 2.69               | 732.16               | 580.49            | 0.20         |
| Upper Reach | 52380     | 25-YEAR  | 973.00           | 50.74             | 59.51             |                   | 59.58             | 0.000801              | 2.80               | 1036.25              | 662.34            | 0.20         |
| Upper Reach | 52380     | 50-YEAR  | 1186.00          | 50.74             | 59.90             |                   | 59.97             | 0.000732              | 2.79               | 1301.33              | 697.23            | 0.19         |
| Upper Reach | 52380     | 100-YEAR | 1425.00          | 50.74             | 60.24             |                   | 60.30             | 0.000733              | 2.88               | 1545.61              | 740.82            | 0.19         |
| Upper Reach | 52610     | 2-YEAR   | 382.00           | 51.93             | 58.22             |                   | 58.34             | 0.001682              | 2.89               | 216.18               | 284.83            | 0.27         |
| Upper Reach | 52610     | 10-YEAR  | 726.00           | 51.93             | 59.24             |                   | 59.35             | 0.001467              | 3.15               | 543.65               | 383.42            | 0.26         |
| Upper Reach | 52610     | 25-YEAR  | 973.00           | 51.93             | 59.72             |                   | 59.82             | 0.001430              | 3.32               | 755.70               | 507.41            | 0.26         |
| Upper Reach | 52610     | 50-YEAR  | 1186.00          | 51.93             | 60.09             |                   | 60.19             | 0.001342              | 3.37               | 949.14               | 531.61            | 0.25         |
| Upper Reach | 52610     | 100-YEAR | 1425.00          | 51.93             | 60.43             |                   | 60.52             | 0.001315              | 3.47               | 1133.38              | 568.83            | 0.25         |
| Upper Reach | 53110     | 2-YEAR   | 382.00           | 52.54             | 59.05             |                   | 59.20             | 0.001732              | 3.03               | 140.23               | 126.43            | 0.27         |
| Upper Reach | 53110     | 10-YEAR  | 726.00           | 52.54             | 60.06             |                   | 60.24             | 0.002102              | 3.81               | 405.25               | 384.41            | 0.30         |
| Upper Reach | 53110     | 25-YEAR  | 973.00           | 52.54             | 60.51             |                   | 60.69             | 0.002062              | 4.00               | 589.03               | 421.57            | 0.31         |
| Upper Reach | 53110     | 50-YEAR  | 1186.00          | 52.54             | 60.84             |                   | 61.02             | 0.002019              | 4.13               | 733.86               | 447.40            | 0.31         |



# FORK SWAMP MAIN BRANCH: EXISTING CONDITIONS

HEC-RAS Plan: Fork Swamp - Ex River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 53110     | 100-YEAR | 1425.00          | 52.54             | 61.17             |                   | 61.34             | 0.002003              | 4.26               | 883.51               | 477.00            | 0.31         |
| Upper Reach | 53471     | 2-YEAR   | 256.00           | 53.33             | 59.66             | 56.29             | 59.73             | 0.001165              | 2.14               | 119.77               | 38.28             | 0.21         |
| Upper Reach | 53471     | 10-YEAR  | 486.00           | 53.33             | 60.80             | 57.57             | 60.92             | 0.001542              | 2.86               | 189.97               | 111.80            | 0.26         |
| Upper Reach | 53471     | 25-YEAR  | 642.00           | 53.33             | 61.24             | 58.03             | 61.40             | 0.001734              | 3.26               | 268.35               | 234.50            | 0.28         |
| Upper Reach | 53471     | 50-YEAR  | 784.00           | 53.33             | 61.57             | 58.41             | 61.74             | 0.001857              | 3.54               | 336.83               | 262.63            | 0.29         |
| Upper Reach | 53471     | 100-YEAR | 937.00           | 53.33             | 61.89             | 58.80             | 62.09             | 0.001935              | 3.78               | 413.49               | 302.71            | 0.30         |
| Upper Reach | 53971     | 2-YEAR   | 256.00           | 54.04             | 60.27             | 57.66             | 60.35             | 0.001302              | 2.35               | 109.81               | 41.78             | 0.23         |
| Upper Reach | 53971     | 10-YEAR  | 486.00           | 54.04             | 61.56             | 58.56             | 61.69             | 0.001528              | 3.00               | 199.55               | 101.07            | 0.26         |
| Upper Reach | 53971     | 25-YEAR  | 642.00           | 54.04             | 62.09             | 59.06             | 62.25             | 0.001669              | 3.38               | 263.13               | 137.64            | 0.28         |
| Upper Reach | 53971     | 50-YEAR  | 784.00           | 54.04             | 62.46             | 59.45             | 62.65             | 0.001789              | 3.69               | 319.08               | 157.19            | 0.29         |
| Upper Reach | 53971     | 100-YEAR | 937.00           | 54.04             | 62.82             | 59.85             | 63.03             | 0.001873              | 3.95               | 378.23               | 170.28            | 0.30         |
| Upper Reach | 54356     | 2-YEAR   | 256.00           | 54.67             | 60.77             | 58.31             | 60.87             | 0.001371              | 2.66               | 111.06               | 44.96             | 0.24         |
| Upper Reach | 54356     | 10-YEAR  | 486.00           | 54.67             | 62.13             | 59.23             | 62.31             | 0.001625              | 3.54               | 185.84               | 71.42             | 0.27         |
| Upper Reach | 54356     | 25-YEAR  | 642.00           | 54.67             | 62.71             | 59.74             | 62.94             | 0.001855              | 4.06               | 238.18               | 97.50             | 0.30         |
| Upper Reach | 54356     | 50-YEAR  | 784.00           | 54.67             | 63.13             | 60.18             | 63.40             | 0.002037              | 4.45               | 281.65               | 108.73            | 0.31         |
| Upper Reach | 54356     | 100-YEAR | 937.00           | 54.67             | 63.53             | 60.62             | 63.83             | 0.002202              | 4.82               | 326.44               | 117.53            | 0.33         |
| Upper Reach | 54540     | 2-YEAR   | 256.00           | 54.97             | 60.98             | 56.80             | 61.02             | 0.000444              | 1.64               | 156.25               | 35.13             | 0.14         |
| Upper Reach | 54540     | 10-YEAR  | 486.00           | 54.97             | 62.44             | 57.69             | 62.52             | 0.000671              | 2.31               | 210.60               | 42.51             | 0.17         |
| Upper Reach | 54540     | 25-YEAR  | 642.00           | 54.97             | 63.07             | 58.19             | 63.19             | 0.000813              | 2.74               | 236.72               | 60.96             | 0.19         |
| Upper Reach | 54540     | 50-YEAR  | 784.00           | 54.97             | 63.53             | 58.60             | 63.68             | 0.000938              | 3.08               | 274.87               | 75.31             | 0.21         |
| Upper Reach | 54540     | 100-YEAR | 937.00           | 54.97             | 63.96             | 59.00             | 64.14             | 0.001069              | 3.43               | 310.00               | 88.75             | 0.23         |
| Upper Reach | 54609     |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 54678     | 2-YEAR   | 256.00           | 54.50             | 61.42             | 56.62             | 61.45             | 0.000335              | 1.47               | 174.33               | 37.53             | 0.12         |
| Upper Reach | 54678     | 10-YEAR  | 486.00           | 54.50             | 63.97             | 57.58             | 64.02             | 0.000316              | 1.73               | 285.50               | 99.89             | 0.12         |
| Upper Reach | 54678     | 25-YEAR  | 642.00           | 54.50             | 65.78             | 58.10             | 65.83             | 0.000242              | 1.75               | 380.22               | 188.12            | 0.11         |
| Upper Reach | 54678     | 50-YEAR  | 784.00           | 54.50             | 66.88             | 58.53             | 66.91             | 0.000167              | 1.59               | 822.72               | 283.79            | 0.09         |
| Upper Reach | 54678     | 100-YEAR | 937.00           | 54.50             | 67.20             | 58.95             | 67.24             | 0.000203              | 1.79               | 920.54               | 324.29            | 0.10         |
| Upper Reach | 54971     | 2-YEAR   | 251.00           | 54.98             | 61.56             |                   | 61.65             | 0.001230              | 2.35               | 106.74               | 30.21             | 0.22         |
| Upper Reach | 54971     | 10-YEAR  | 475.00           | 54.98             | 64.09             |                   | 64.18             | 0.000826              | 2.44               | 209.80               | 93.65             | 0.19         |
| Upper Reach | 54971     | 25-YEAR  | 629.00           | 54.98             | 65.87             |                   | 65.93             | 0.000431              | 2.15               | 439.48               | 166.74            | 0.14         |
| Upper Reach | 54971     | 50-YEAR  | 765.00           | 54.98             | 66.94             |                   | 66.99             | 0.000325              | 2.06               | 674.60               | 303.25            | 0.13         |
| Upper Reach | 54971     | 100-YEAR | 916.00           | 54.98             | 67.27             |                   | 67.33             | 0.000381              | 2.29               | 780.09               | 340.24            | 0.14         |

# FORK SWAMP MAIN BRANCH: EXISTING CONDITIONS

HEC-RAS Plan: Fork Swamp - Ex River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 55437     | 2-YEAR   | 251.00           | 54.98             | 62.06             |                   | 62.13             | 0.000846              | 2.05               | 122.20               | 31.88             | 0.18         |
| Upper Reach | 55437     | 10-YEAR  | 475.00           | 54.98             | 64.45             |                   | 64.52             | 0.000640              | 2.24               | 245.59               | 104.94            | 0.17         |
| Upper Reach | 55437     | 25-YEAR  | 629.00           | 54.98             | 66.07             |                   | 66.12             | 0.000378              | 2.05               | 472.86               | 171.80            | 0.14         |
| Upper Reach | 55437     | 50-YEAR  | 765.00           | 54.98             | 67.09             |                   | 67.14             | 0.000294              | 1.98               | 721.24               | 311.46            | 0.12         |
| Upper Reach | 55437     | 100-YEAR | 916.00           | 54.98             | 67.44             |                   | 67.50             | 0.000338              | 2.18               | 841.49               | 352.33            | 0.13         |
| Upper Reach | 55537     | 2-YEAR   | 251.00           | 55.92             | 62.15             | 58.18             | 62.20             | 0.000539              | 1.78               | 140.69               | 34.05             | 0.15         |
| Upper Reach | 55537     | 10-YEAR  | 475.00           | 55.92             | 64.52             | 59.15             | 64.58             | 0.000379              | 1.92               | 310.25               | 192.90            | 0.14         |
| Upper Reach | 55537     | 25-YEAR  | 629.00           | 55.92             | 66.11             | 59.68             | 66.16             | 0.000249              | 1.82               | 491.54               | 290.80            | 0.12         |
| Upper Reach | 55537     | 50-YEAR  | 765.00           | 55.92             | 67.12             | 60.10             | 67.16             | 0.000216              | 1.84               | 612.48               | 435.34            | 0.11         |
| Upper Reach | 55537     | 100-YEAR | 916.00           | 55.92             | 67.51             | 60.53             | 67.53             | 0.000141              | 1.53               | 1304.45              | 516.07            | 0.09         |
| Upper Reach | 55592     |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 55651     | 2-YEAR   | 251.00           | 57.89             | 63.05             | 59.67             | 63.10             | 0.000652              | 1.91               | 131.07               | 32.39             | 0.17         |
| Upper Reach | 55651     | 10-YEAR  | 475.00           | 57.89             | 65.99             | 60.50             | 66.04             | 0.000341              | 1.83               | 339.16               | 413.19            | 0.13         |
| Upper Reach | 55651     | 25-YEAR  | 629.00           | 57.89             | 68.74             | 60.97             | 68.76             | 0.000113              | 1.34               | 669.30               | 753.52            | 0.08         |
| Upper Reach | 55651     | 50-YEAR  | 765.00           | 57.89             | 70.97             | 61.36             | 70.97             | 0.000017              | 0.61               | 3873.80              | 2138.39           | 0.03         |
| Upper Reach | 55651     | 100-YEAR | 916.00           | 57.89             | 71.35             | 61.75             | 71.35             | 0.000016              | 0.60               | 5283.02              | 2687.02           | 0.03         |
| Upper Reach | 55788     | 2-YEAR   | 188.00           | 57.96             | 63.15             | 60.26             | 63.21             | 0.000976              | 2.04               | 92.37                | 29.03             | 0.20         |
| Upper Reach | 55788     | 10-YEAR  | 352.00           | 57.96             | 66.04             | 61.15             | 66.09             | 0.000376              | 1.72               | 300.86               | 283.94            | 0.13         |
| Upper Reach | 55788     | 25-YEAR  | 468.00           | 57.96             | 68.77             | 61.65             | 68.78             | 0.000036              | 0.71               | 1916.28              | 1039.60           | 0.04         |
| Upper Reach | 55788     | 50-YEAR  | 569.00           | 57.96             | 70.97             | 62.03             | 70.98             | 0.000010              | 0.44               | 4011.71              | 2658.23           | 0.02         |
| Upper Reach | 55788     | 100-YEAR | 681.00           | 57.96             | 71.35             | 62.40             | 71.36             | 0.000011              | 0.47               | 4428.67              | 2991.67           | 0.03         |
| Upper Reach | 55853     | 2-YEAR   | 188.00           | 58.92             | 63.22             | 60.37             | 63.27             | 0.000696              | 1.83               | 102.81               | 28.93             | 0.17         |
| Upper Reach | 55853     | 10-YEAR  | 352.00           | 58.92             | 66.06             | 61.05             | 66.11             | 0.000345              | 1.80               | 296.98               | 275.45            | 0.13         |
| Upper Reach | 55853     | 25-YEAR  | 468.00           | 58.92             | 68.77             | 61.46             | 68.78             | 0.000059              | 0.95               | 1386.83              | 633.52            | 0.06         |
| Upper Reach | 55853     | 50-YEAR  | 569.00           | 58.92             | 70.97             | 61.79             | 70.98             | 0.000017              | 0.59               | 3124.43              | 2753.95           | 0.03         |
| Upper Reach | 55853     | 100-YEAR | 681.00           | 58.92             | 71.35             | 62.12             | 71.36             | 0.000019              | 0.63               | 3492.06              | 2989.48           | 0.03         |
| Upper Reach | 55891     |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 55958     | 2-YEAR   | 188.00           | 58.73             | 63.88             | 60.53             | 63.92             | 0.000517              | 1.70               | 112.10               | 30.23             | 0.15         |
| Upper Reach | 55958     | 10-YEAR  | 352.00           | 58.73             | 66.27             | 61.29             | 66.32             | 0.000352              | 1.84               | 293.85               | 249.19            | 0.13         |
| Upper Reach | 55958     | 25-YEAR  | 468.00           | 58.73             | 68.77             | 61.73             | 68.78             | 0.000073              | 1.06               | 1328.23              | 721.62            | 0.06         |
| Upper Reach | 55958     | 50-YEAR  | 569.00           | 58.73             | 70.98             | 62.08             | 70.98             | 0.000017              | 0.59               | 3145.16              | 2080.04           | 0.03         |

# FORK SWAMP MAIN BRANCH: EXISTING CONDITIONS

HEC-RAS Plan: Fork Swamp - Ex River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 55958     | 100-YEAR | 681.00           | 58.73             | 71.36             | 62.43             | 71.36             | 0.000018              | 0.63               | 3508.95              | 2547.35           | 0.03         |
| Upper Reach | 56230     | 2-YEAR   | 188.00           | 59.25             | 64.09             | 61.83             | 64.22             | 0.002135              | 2.83               | 66.38                | 22.09             | 0.29         |
| Upper Reach | 56230     | 10-YEAR  | 352.00           | 59.25             | 66.40             | 62.81             | 66.51             | 0.001255              | 2.74               | 148.21               | 116.92            | 0.23         |
| Upper Reach | 56230     | 25-YEAR  | 468.00           | 59.25             | 68.80             | 63.35             | 68.82             | 0.000199              | 1.45               | 884.10               | 606.88            | 0.10         |
| Upper Reach | 56230     | 50-YEAR  | 569.00           | 59.25             | 70.98             | 63.78             | 70.99             | 0.000035              | 0.73               | 2463.06              | 2452.85           | 0.04         |
| Upper Reach | 56230     | 100-YEAR | 681.00           | 59.25             | 71.36             | 64.19             | 71.37             | 0.000036              | 0.76               | 2797.16              | 2804.56           | 0.04         |

# FORK SWAMP UT1: EXISTING CONDITIONS

HEC-RAS Plan: FSUT1 - Ex River: Fork Swamp UT1 Reach: Reach 1

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 1030      | 2-Year   | 209.00           | 45.23             | 50.44             | 47.53             | 50.45             | 0.000131              | 0.93               | 732.39               | 568.79            | 0.09         |
| Reach 1 | 1030      | 10-Year  | 462.00           | 45.23             | 51.67             | 49.09             | 51.67             | 0.000093              | 0.96               | 1462.20              | 617.90            | 0.08         |
| Reach 1 | 1030      | 25-Year  | 651.00           | 45.23             | 52.32             | 49.73             | 52.32             | 0.000089              | 1.02               | 1872.27              | 643.84            | 0.08         |
| Reach 1 | 1030      | 50-Year  | 839.00           | 45.23             | 52.84             | 49.85             | 52.84             | 0.000090              | 1.09               | 2212.48              | 664.76            | 0.08         |
| Reach 1 | 1030      | 100-Year | 1043.00          | 45.23             | 53.37             | 50.01             | 53.38             | 0.000088              | 1.14               | 2570.52              | 686.35            | 0.08         |
| Reach 1 | 1579      | 2-Year   | 209.00           | 45.55             | 50.53             |                   | 50.55             | 0.000268              | 1.45               | 355.25               | 578.81            | 0.13         |
| Reach 1 | 1579      | 10-Year  | 462.00           | 45.55             | 51.73             |                   | 51.74             | 0.000141              | 1.26               | 1258.42              | 914.39            | 0.10         |
| Reach 1 | 1579      | 25-Year  | 651.00           | 45.55             | 52.37             |                   | 52.38             | 0.000104              | 1.17               | 1888.73              | 1014.05           | 0.09         |
| Reach 1 | 1579      | 50-Year  | 839.00           | 45.55             | 52.89             |                   | 52.89             | 0.000087              | 1.14               | 2421.45              | 1046.79           | 0.08         |
| Reach 1 | 1579      | 100-Year | 1043.00          | 45.55             | 53.41             |                   | 53.42             | 0.000075              | 1.11               | 2981.55              | 1080.14           | 0.07         |
| Reach 1 | 1890      | 2-Year   | 209.00           | 44.89             | 50.62             |                   | 50.65             | 0.000354              | 1.49               | 307.91               | 448.15            | 0.14         |
| Reach 1 | 1890      | 10-Year  | 462.00           | 44.89             | 51.78             |                   | 51.78             | 0.000142              | 1.09               | 925.99               | 594.65            | 0.09         |
| Reach 1 | 1890      | 25-Year  | 651.00           | 44.89             | 52.41             |                   | 52.41             | 0.000107              | 1.03               | 1445.67              | 951.36            | 0.08         |
| Reach 1 | 1890      | 50-Year  | 839.00           | 44.89             | 52.92             |                   | 52.92             | 0.000081              | 0.96               | 1951.68              | 1029.05           | 0.07         |
| Reach 1 | 1890      | 100-Year | 1043.00          | 44.89             | 53.44             |                   | 53.44             | 0.000064              | 0.91               | 2507.48              | 1102.30           | 0.07         |
| Reach 1 | 2517      | 2-Year   | 195.00           | 46.14             | 50.95             |                   | 51.03             | 0.001205              | 2.33               | 113.43               | 154.99            | 0.26         |
| Reach 1 | 2517      | 10-Year  | 410.00           | 46.14             | 51.92             |                   | 51.96             | 0.000828              | 2.24               | 351.29               | 357.88            | 0.22         |
| Reach 1 | 2517      | 25-Year  | 577.00           | 46.14             | 52.51             |                   | 52.53             | 0.000457              | 1.86               | 699.37               | 642.04            | 0.17         |
| Reach 1 | 2517      | 50-Year  | 719.00           | 46.14             | 52.99             |                   | 53.01             | 0.000277              | 1.57               | 1020.72              | 691.15            | 0.13         |
| Reach 1 | 2517      | 100-Year | 897.00           | 46.14             | 53.49             |                   | 53.51             | 0.000193              | 1.41               | 1381.94              | 742.15            | 0.11         |
| Reach 1 | 3185      | 2-Year   | 195.00           | 47.31             | 51.98             |                   | 52.17             | 0.002402              | 3.47               | 63.75                | 52.44             | 0.35         |
| Reach 1 | 3185      | 10-Year  | 410.00           | 47.31             | 52.72             |                   | 52.88             | 0.002416              | 3.96               | 225.88               | 323.51            | 0.37         |
| Reach 1 | 3185      | 25-Year  | 577.00           | 47.31             | 53.01             |                   | 53.15             | 0.002317              | 4.08               | 329.16               | 380.62            | 0.36         |
| Reach 1 | 3185      | 50-Year  | 719.00           | 47.31             | 53.31             |                   | 53.42             | 0.001839              | 3.82               | 455.50               | 450.57            | 0.33         |
| Reach 1 | 3185      | 100-Year | 897.00           | 47.31             | 53.72             |                   | 53.79             | 0.001224              | 3.31               | 654.06               | 518.21            | 0.27         |
| Reach 1 | 3294      | 2-Year   | 195.00           | 48.24             | 52.24             | 50.60             | 52.42             | 0.002287              | 3.47               | 60.22                | 58.91             | 0.35         |
| Reach 1 | 3294      | 10-Year  | 410.00           | 48.24             | 52.93             | 51.74             | 53.37             | 0.004413              | 5.54               | 87.82                | 136.33            | 0.51         |
| Reach 1 | 3294      | 25-Year  | 577.00           | 48.24             | 53.12             | 52.66             | 53.86             | 0.007059              | 7.25               | 95.73                | 183.47            | 0.65         |
| Reach 1 | 3294      | 50-Year  | 719.00           | 48.24             | 53.23             | 53.07             | 54.29             | 0.009779              | 8.69               | 100.11               | 197.24            | 0.77         |
| Reach 1 | 3294      | 100-Year | 897.00           | 48.24             | 53.79             | 53.53             | 54.18             | 0.004390              | 6.36               | 347.62               | 409.35            | 0.53         |
| Reach 1 | 3380      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |

# FORK SWAMP UT1: EXISTING CONDITIONS

HEC-RAS Plan: FSUT1 - Ex River: Fork Swamp UT1 Reach: Reach 1 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 3462      | 2-Year   | 195.00           | 48.46             | 52.31             | 50.74             | 52.50             | 0.002279              | 3.51               | 66.27                | 53.98             | 0.35         |
| Reach 1 | 3462      | 10-Year  | 410.00           | 48.46             | 53.39             | 51.90             | 53.66             | 0.002607              | 4.58               | 118.02               | 88.77             | 0.39         |
| Reach 1 | 3462      | 25-Year  | 577.00           | 48.46             | 54.26             | 52.78             | 54.53             | 0.002225              | 4.79               | 159.45               | 189.94            | 0.38         |
| Reach 1 | 3462      | 50-Year  | 719.00           | 48.46             | 55.05             | 53.12             | 55.15             | 0.001023              | 3.58               | 437.09               | 281.66            | 0.26         |
| Reach 1 | 3462      | 100-Year | 897.00           | 48.46             | 55.43             | 53.48             | 55.53             | 0.001019              | 3.73               | 555.18               | 348.57            | 0.26         |
| Reach 1 | 3544      | 2-Year   | 111.00           | 48.30             | 52.59             |                   | 52.64             | 0.000633              | 1.93               | 66.95                | 33.38             | 0.19         |
| Reach 1 | 3544      | 10-Year  | 231.00           | 48.30             | 53.75             |                   | 53.84             | 0.000799              | 2.61               | 123.08               | 66.48             | 0.22         |
| Reach 1 | 3544      | 25-Year  | 319.00           | 48.30             | 54.61             |                   | 54.70             | 0.000668              | 2.69               | 197.59               | 111.82            | 0.21         |
| Reach 1 | 3544      | 50-Year  | 399.00           | 48.30             | 55.15             |                   | 55.23             | 0.000620              | 2.76               | 266.83               | 149.74            | 0.20         |
| Reach 1 | 3544      | 100-Year | 490.00           | 48.30             | 55.53             |                   | 55.61             | 0.000623              | 2.89               | 329.57               | 172.24            | 0.21         |
| Reach 1 | 4000      | 2-Year   | 111.00           | 48.08             | 52.82             |                   | 52.84             | 0.000313              | 1.30               | 128.55               | 110.74            | 0.13         |
| Reach 1 | 4000      | 10-Year  | 231.00           | 48.08             | 54.01             |                   | 54.03             | 0.000231              | 1.37               | 290.77               | 165.26            | 0.12         |
| Reach 1 | 4000      | 25-Year  | 319.00           | 48.08             | 54.82             |                   | 54.84             | 0.000158              | 1.27               | 427.53               | 171.85            | 0.10         |
| Reach 1 | 4000      | 50-Year  | 399.00           | 48.08             | 55.34             |                   | 55.36             | 0.000143              | 1.30               | 518.39               | 176.10            | 0.10         |
| Reach 1 | 4000      | 100-Year | 490.00           | 48.08             | 55.73             |                   | 55.74             | 0.000151              | 1.39               | 586.35               | 179.20            | 0.10         |
| Reach 1 | 4181      | 2-Year   | 111.00           | 47.72             | 52.87             | 49.63             | 52.89             | 0.000224              | 1.15               | 96.14                | 30.11             | 0.11         |
| Reach 1 | 4181      | 10-Year  | 231.00           | 47.72             | 54.05             | 50.34             | 54.09             | 0.000328              | 1.63               | 182.61               | 184.49            | 0.14         |
| Reach 1 | 4181      | 25-Year  | 319.00           | 47.72             | 54.85             | 50.75             | 54.88             | 0.000216              | 1.49               | 371.33               | 268.26            | 0.12         |
| Reach 1 | 4181      | 50-Year  | 399.00           | 47.72             | 55.37             | 51.09             | 55.39             | 0.000172              | 1.43               | 523.80               | 316.23            | 0.11         |
| Reach 1 | 4181      | 100-Year | 490.00           | 47.72             | 55.75             | 51.42             | 55.77             | 0.000163              | 1.45               | 651.54               | 348.89            | 0.11         |
| Reach 1 | 4235      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 4289      | 2-Year   | 111.00           | 48.47             | 53.05             | 50.20             | 53.08             | 0.000294              | 1.26               | 88.15                | 41.81             | 0.13         |
| Reach 1 | 4289      | 10-Year  | 231.00           | 48.47             | 54.67             | 50.92             | 54.70             | 0.000224              | 1.44               | 228.62               | 152.11            | 0.12         |
| Reach 1 | 4289      | 25-Year  | 319.00           | 48.47             | 55.14             | 51.33             | 55.18             | 0.000247              | 1.61               | 304.82               | 171.39            | 0.13         |
| Reach 1 | 4289      | 50-Year  | 399.00           | 48.47             | 55.43             | 51.66             | 55.47             | 0.000281              | 1.79               | 356.39               | 182.94            | 0.14         |
| Reach 1 | 4289      | 100-Year | 490.00           | 48.47             | 55.78             | 51.99             | 55.82             | 0.000296              | 1.92               | 421.67               | 201.72            | 0.14         |
| Reach 1 | 4389      | 2-Year   | 107.00           | 48.47             | 53.08             |                   | 53.10             | 0.000263              | 1.20               | 91.77                | 42.70             | 0.12         |
| Reach 1 | 4389      | 10-Year  | 223.00           | 48.47             | 54.70             |                   | 54.72             | 0.000206              | 1.38               | 233.13               | 161.72            | 0.12         |
| Reach 1 | 4389      | 25-Year  | 309.00           | 48.47             | 55.17             |                   | 55.20             | 0.000231              | 1.57               | 318.88               | 201.26            | 0.13         |
| Reach 1 | 4389      | 50-Year  | 387.00           | 48.47             | 55.46             |                   | 55.50             | 0.000261              | 1.73               | 381.93               | 225.79            | 0.13         |
| Reach 1 | 4389      | 100-Year | 474.00           | 48.47             | 55.81             |                   | 55.85             | 0.000268              | 1.83               | 464.93               | 254.51            | 0.14         |

# FORK SWAMP UT1: EXISTING CONDITIONS

HEC-RAS Plan: FSUT1 - Ex River: Fork Swamp UT1 Reach: Reach 1 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 4764      | 2-Year   | 107.00           | 47.90             | 53.19             |                   | 53.23             | 0.000417              | 1.56               | 74.30                | 34.25             | 0.15         |
| Reach 1 | 4764      | 10-Year  | 223.00           | 47.90             | 54.78             |                   | 54.82             | 0.000320              | 1.78               | 190.08               | 105.94            | 0.14         |
| Reach 1 | 4764      | 25-Year  | 309.00           | 47.90             | 55.26             |                   | 55.31             | 0.000367              | 2.03               | 243.48               | 115.37            | 0.16         |
| Reach 1 | 4764      | 50-Year  | 387.00           | 47.90             | 55.57             |                   | 55.63             | 0.000422              | 2.26               | 280.51               | 135.97            | 0.17         |
| Reach 1 | 4764      | 100-Year | 474.00           | 47.90             | 55.92             |                   | 55.98             | 0.000449              | 2.43               | 334.85               | 175.70            | 0.18         |
| Reach 1 | 5050      | 2-Year   | 107.00           | 49.18             | 53.32             | 50.67             | 53.35             | 0.000386              | 1.42               | 75.42                | 25.71             | 0.15         |
| Reach 1 | 5050      | 10-Year  | 223.00           | 49.18             | 54.88             | 51.36             | 54.94             | 0.000465              | 1.86               | 119.61               | 30.65             | 0.17         |
| Reach 1 | 5050      | 25-Year  | 309.00           | 49.18             | 55.38             | 51.78             | 55.46             | 0.000581              | 2.25               | 152.66               | 88.78             | 0.19         |
| Reach 1 | 5050      | 50-Year  | 387.00           | 49.18             | 55.70             | 52.11             | 55.80             | 0.000677              | 2.55               | 184.90               | 111.10            | 0.21         |
| Reach 1 | 5050      | 100-Year | 474.00           | 49.18             | 56.06             | 52.45             | 56.17             | 0.000735              | 2.79               | 229.14               | 154.61            | 0.22         |
| Reach 1 | 5103      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 5154      | 2-Year   | 107.00           | 49.76             | 53.69             | 51.21             | 53.73             | 0.000499              | 1.58               | 68.25                | 26.36             | 0.17         |
| Reach 1 | 5154      | 10-Year  | 223.00           | 49.76             | 55.95             | 51.95             | 55.98             | 0.000220              | 1.48               | 222.57               | 134.95            | 0.12         |
| Reach 1 | 5154      | 25-Year  | 309.00           | 49.76             | 56.29             | 52.39             | 56.33             | 0.000303              | 1.82               | 272.46               | 167.27            | 0.14         |
| Reach 1 | 5154      | 50-Year  | 387.00           | 49.76             | 56.48             | 52.74             | 56.53             | 0.000389              | 2.11               | 306.08               | 188.42            | 0.16         |
| Reach 1 | 5154      | 100-Year | 474.00           | 49.76             | 56.63             | 53.09             | 56.70             | 0.000493              | 2.43               | 336.74               | 206.92            | 0.18         |
| Reach 1 | 5289      | 2-Year   | 107.00           | 49.08             | 53.77             |                   | 53.83             | 0.000826              | 2.02               | 57.88                | 28.38             | 0.21         |
| Reach 1 | 5289      | 10-Year  | 223.00           | 49.08             | 55.99             |                   | 56.01             | 0.000168              | 1.33               | 341.71               | 228.26            | 0.10         |
| Reach 1 | 5289      | 25-Year  | 309.00           | 49.08             | 56.35             |                   | 56.37             | 0.000194              | 1.49               | 424.15               | 238.76            | 0.11         |
| Reach 1 | 5289      | 50-Year  | 387.00           | 49.08             | 56.56             |                   | 56.58             | 0.000230              | 1.66               | 475.19               | 251.09            | 0.12         |
| Reach 1 | 5289      | 100-Year | 474.00           | 49.08             | 56.74             |                   | 56.76             | 0.000275              | 1.86               | 520.83               | 261.62            | 0.14         |

# FORK SWAMP UT2R1: EXISTING CONDITIONS

HEC-RAS Plan: FSUTR1 - Ex River: Fork Swamp UT2 Reach: Reach 1

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 694.0     | 2-Year   | 276.00           | 45.13             | 50.61             | 47.66             | 50.66             | 0.000789              | 2.07               | 442.66               | 498.12            | 0.17         |
| Reach 1 | 694.0     | 10-Year  | 561.00           | 45.13             | 51.84             | 48.88             | 51.87             | 0.000506              | 1.95               | 1124.24              | 606.92            | 0.14         |
| Reach 1 | 694.0     | 25-Year  | 771.00           | 45.13             | 52.65             | 50.44             | 52.67             | 0.000372              | 1.82               | 1642.25              | 672.02            | 0.13         |
| Reach 1 | 694.0     | 50-Year  | 958.00           | 45.13             | 53.18             | 50.64             | 53.20             | 0.000338              | 1.83               | 2012.97              | 733.97            | 0.12         |
| Reach 1 | 694.0     | 100-Year | 1168.00          | 45.13             | 53.56             | 50.83             | 53.58             | 0.000355              | 1.94               | 2301.16              | 779.41            | 0.13         |
| Reach 1 | 1255.9    | 2-Year   | 276.00           | 46.84             | 51.27             |                   | 51.37             | 0.002210              | 2.91               | 243.77               | 266.00            | 0.27         |
| Reach 1 | 1255.9    | 10-Year  | 561.00           | 46.84             | 52.29             |                   | 52.38             | 0.001888              | 3.19               | 578.28               | 387.54            | 0.27         |
| Reach 1 | 1255.9    | 25-Year  | 771.00           | 46.84             | 52.99             |                   | 53.05             | 0.001477              | 3.11               | 876.89               | 484.97            | 0.24         |
| Reach 1 | 1255.9    | 50-Year  | 958.00           | 46.84             | 53.48             |                   | 53.54             | 0.001270              | 3.06               | 1139.66              | 569.77            | 0.23         |
| Reach 1 | 1255.9    | 100-Year | 1168.00          | 46.84             | 53.87             |                   | 53.93             | 0.001233              | 3.15               | 1373.34              | 630.94            | 0.23         |
| Reach 1 | 1877.0    | 2-Year   | 276.00           | 47.35             | 52.36             |                   | 52.44             | 0.001392              | 2.56               | 298.84               | 367.64            | 0.22         |
| Reach 1 | 1877.0    | 10-Year  | 561.00           | 47.35             | 53.30             |                   | 53.37             | 0.001361              | 2.91               | 770.58               | 664.48            | 0.23         |
| Reach 1 | 1877.0    | 25-Year  | 771.00           | 47.35             | 53.81             |                   | 53.87             | 0.001164              | 2.87               | 1131.20              | 731.44            | 0.22         |
| Reach 1 | 1877.0    | 50-Year  | 958.00           | 47.35             | 54.20             |                   | 54.25             | 0.001031              | 2.83               | 1425.40              | 772.72            | 0.21         |
| Reach 1 | 1877.0    | 100-Year | 1168.00          | 47.35             | 54.56             |                   | 54.61             | 0.000966              | 2.85               | 1713.63              | 811.13            | 0.20         |
| Reach 1 | 2384.0    | 2-Year   | 215.00           | 47.08             | 52.75             |                   | 52.77             | 0.000318              | 1.35               | 546.28               | 455.16            | 0.11         |
| Reach 1 | 2384.0    | 10-Year  | 439.00           | 47.08             | 53.70             |                   | 53.72             | 0.000353              | 1.61               | 987.22               | 480.03            | 0.12         |
| Reach 1 | 2384.0    | 25-Year  | 604.00           | 47.08             | 54.19             |                   | 54.21             | 0.000385              | 1.78               | 1225.56              | 498.70            | 0.13         |
| Reach 1 | 2384.0    | 50-Year  | 752.00           | 47.08             | 54.56             |                   | 54.58             | 0.000418              | 1.93               | 1417.67              | 518.63            | 0.13         |
| Reach 1 | 2384.0    | 100-Year | 914.00           | 47.08             | 54.92             |                   | 54.94             | 0.000443              | 2.05               | 1605.21              | 528.39            | 0.14         |
| Reach 1 | 2971.0    | 2-Year   | 215.00           | 46.38             | 53.01             |                   | 53.07             | 0.000819              | 2.03               | 196.03               | 191.43            | 0.17         |
| Reach 1 | 2971.0    | 10-Year  | 439.00           | 46.38             | 53.99             |                   | 54.08             | 0.001127              | 2.72               | 432.92               | 290.95            | 0.21         |
| Reach 1 | 2971.0    | 25-Year  | 604.00           | 46.38             | 54.51             |                   | 54.60             | 0.001232              | 3.02               | 596.40               | 339.92            | 0.22         |
| Reach 1 | 2971.0    | 50-Year  | 752.00           | 46.38             | 54.91             |                   | 55.00             | 0.001268              | 3.20               | 746.88               | 414.15            | 0.22         |
| Reach 1 | 2971.0    | 100-Year | 914.00           | 46.38             | 55.28             |                   | 55.38             | 0.001274              | 3.34               | 915.29               | 485.20            | 0.23         |
| Reach 1 | 3403.0    | 2-Year   | 215.00           | 46.52             | 53.36             |                   | 53.43             | 0.000832              | 2.11               | 116.97               | 51.15             | 0.17         |
| Reach 1 | 3403.0    | 10-Year  | 439.00           | 46.52             | 54.49             |                   | 54.63             | 0.001367              | 3.13               | 302.72               | 369.68            | 0.23         |
| Reach 1 | 3403.0    | 25-Year  | 604.00           | 46.52             | 55.04             |                   | 55.17             | 0.001351              | 3.30               | 530.98               | 435.83            | 0.23         |
| Reach 1 | 3403.0    | 50-Year  | 752.00           | 46.52             | 55.45             |                   | 55.56             | 0.001292              | 3.37               | 711.63               | 454.82            | 0.23         |
| Reach 1 | 3403.0    | 100-Year | 914.00           | 46.52             | 55.82             |                   | 55.93             | 0.001258              | 3.45               | 884.74               | 474.64            | 0.23         |
| Reach 1 | 3469.8    | 2-Year   | 215.00           | 46.75             | 53.42             | 49.15             | 53.48             | 0.000761              | 2.04               | 108.38               | 84.99             | 0.16         |
| Reach 1 | 3469.8    | 10-Year  | 439.00           | 46.75             | 54.59             | 50.36             | 54.72             | 0.001226              | 2.99               | 292.78               | 347.69            | 0.22         |

# FORK SWAMP UT2R1: EXISTING CONDITIONS

HEC-RAS Plan: FSUTR1 - Ex River: Fork Swamp UT2 Reach: Reach 1 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 3469.8    | 25-Year  | 604.00           | 46.75             | 55.12             | 51.06             | 55.27             | 0.001408              | 3.39               | 416.56               | 405.37            | 0.23         |
| Reach 1 | 3469.8    | 50-Year  | 752.00           | 46.75             | 55.54             | 51.62             | 55.65             | 0.001160              | 3.21               | 758.42               | 438.05            | 0.21         |
| Reach 1 | 3469.8    | 100-Year | 914.00           | 46.75             | 55.91             | 52.27             | 56.01             | 0.001169              | 3.34               | 920.38               | 447.33            | 0.22         |
| Reach 1 | 3499.8    |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 3529.8    | 2-Year   | 215.00           | 46.96             | 55.44             | 49.37             | 55.47             | 0.000257              | 1.47               | 155.55               | 416.06            | 0.10         |
| Reach 1 | 3529.8    | 10-Year  | 439.00           | 46.96             | 56.26             | 50.56             | 56.29             | 0.000338              | 1.82               | 634.41               | 450.80            | 0.12         |
| Reach 1 | 3529.8    | 25-Year  | 604.00           | 46.96             | 56.59             | 51.27             | 56.61             | 0.000325              | 1.83               | 1132.81              | 459.22            | 0.12         |
| Reach 1 | 3529.8    | 50-Year  | 752.00           | 46.96             | 56.71             | 51.83             | 56.75             | 0.000452              | 2.18               | 1188.47              | 462.29            | 0.14         |
| Reach 1 | 3529.8    | 100-Year | 914.00           | 46.96             | 56.86             | 52.48             | 56.91             | 0.000588              | 2.52               | 1260.75              | 471.59            | 0.16         |
| Reach 1 | 3921.0    | 2-Year   | 215.00           | 48.00             | 55.53             |                   | 55.54             | 0.000101              | 0.94               | 828.09               | 412.95            | 0.07         |
| Reach 1 | 3921.0    | 10-Year  | 439.00           | 48.00             | 56.38             |                   | 56.39             | 0.000189              | 1.40               | 1206.92              | 483.90            | 0.09         |
| Reach 1 | 3921.0    | 25-Year  | 604.00           | 48.00             | 56.71             |                   | 56.73             | 0.000268              | 1.73               | 1373.16              | 512.34            | 0.11         |
| Reach 1 | 3921.0    | 50-Year  | 752.00           | 48.00             | 56.88             |                   | 56.91             | 0.000361              | 2.03               | 1460.61              | 526.68            | 0.13         |
| Reach 1 | 3921.0    | 100-Year | 914.00           | 48.00             | 57.09             |                   | 57.12             | 0.000450              | 2.31               | 1570.25              | 542.48            | 0.15         |



# FORK SWAMP UT2R2: EXISTING CONDITIONS

HEC-RAS Plan: FSUT2R2 - Ex River: Fork Swamp UT2 Reach: Reach 2

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 41        | 2-Year   | 99.00            | 57.18             | 60.14             | 59.24             | 60.32             | 0.004301              | 3.39               | 29.16                | 16.56             | 0.45         |
| Reach 2 | 41        | 10-Year  | 201.00           | 57.18             | 61.20             | 60.02             | 61.46             | 0.004301              | 4.13               | 48.71                | 20.38             | 0.47         |
| Reach 2 | 41        | 25-Year  | 276.00           | 57.18             | 61.79             | 60.46             | 62.10             | 0.004306              | 4.49               | 61.43                | 22.52             | 0.48         |
| Reach 2 | 41        | 50-Year  | 343.00           | 57.18             | 62.25             | 60.81             | 62.60             | 0.004302              | 4.76               | 72.11                | 24.17             | 0.49         |
| Reach 2 | 41        | 100-Year | 419.00           | 57.18             | 62.71             | 61.14             | 63.10             | 0.004302              | 5.01               | 83.60                | 25.83             | 0.49         |
| Reach 2 | 144       | 2-Year   | 99.00            | 56.44             | 60.51             | 58.84             | 60.59             | 0.001449              | 2.18               | 45.36                | 22.16             | 0.27         |
| Reach 2 | 144       | 10-Year  | 201.00           | 56.44             | 61.65             | 59.63             | 61.76             | 0.001622              | 2.72               | 73.94                | 28.25             | 0.30         |
| Reach 2 | 144       | 25-Year  | 276.00           | 56.44             | 62.28             | 60.07             | 62.41             | 0.001665              | 2.97               | 92.86                | 31.64             | 0.31         |
| Reach 2 | 144       | 50-Year  | 343.00           | 56.44             | 62.76             | 60.40             | 62.92             | 0.001682              | 3.15               | 108.89               | 34.25             | 0.31         |
| Reach 2 | 144       | 100-Year | 419.00           | 56.44             | 63.25             | 60.73             | 63.42             | 0.001691              | 3.32               | 126.27               | 36.88             | 0.32         |
| Reach 2 | 220       | Culvert  |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 303       | 2-Year   | 99.00            | 58.23             | 60.61             | 59.18             | 60.63             | 0.000473              | 1.15               | 86.07                | 50.16             | 0.15         |
| Reach 2 | 303       | 10-Year  | 201.00           | 58.23             | 61.90             | 59.55             | 61.92             | 0.000334              | 1.28               | 157.08               | 59.92             | 0.14         |
| Reach 2 | 303       | 25-Year  | 276.00           | 58.23             | 62.67             | 59.78             | 62.70             | 0.000291              | 1.34               | 205.90               | 65.80             | 0.13         |
| Reach 2 | 303       | 50-Year  | 343.00           | 58.23             | 63.30             | 59.95             | 63.33             | 0.000254              | 1.38               | 251.51               | 83.25             | 0.13         |
| Reach 2 | 303       | 100-Year | 419.00           | 58.23             | 63.96             | 60.14             | 63.99             | 0.000212              | 1.41               | 314.04               | 128.15            | 0.12         |
| Reach 2 | 460       | 2-Year   | 74.00            | 58.69             | 60.61             | 60.61             | 61.18             | 0.024951              | 6.05               | 12.23                | 10.95             | 1.01         |
| Reach 2 | 460       | 10-Year  | 154.00           | 58.69             | 61.81             |                   | 62.26             | 0.010974              | 5.39               | 28.56                | 16.28             | 0.72         |
| Reach 2 | 460       | 25-Year  | 214.00           | 58.69             | 62.60             |                   | 62.99             | 0.007162              | 5.00               | 42.82                | 19.78             | 0.60         |
| Reach 2 | 460       | 50-Year  | 268.00           | 58.69             | 63.23             |                   | 63.59             | 0.005448              | 4.77               | 56.13                | 22.57             | 0.53         |
| Reach 2 | 460       | 100-Year | 329.00           | 58.69             | 63.89             |                   | 64.21             | 0.004236              | 4.58               | 71.91                | 25.49             | 0.48         |
| Reach 2 | 783       | 2-Year   | 74.00            | 58.90             | 62.63             | 61.17             | 62.71             | 0.001852              | 2.29               | 32.36                | 17.35             | 0.30         |
| Reach 2 | 783       | 10-Year  | 154.00           | 58.90             | 63.59             |                   | 63.73             | 0.002368              | 3.01               | 51.17                | 21.86             | 0.35         |
| Reach 2 | 783       | 25-Year  | 214.00           | 58.90             | 64.13             |                   | 64.30             | 0.002550              | 3.36               | 63.71                | 24.41             | 0.37         |
| Reach 2 | 783       | 50-Year  | 268.00           | 58.90             | 64.57             |                   | 64.77             | 0.002584              | 3.57               | 75.06                | 26.50             | 0.37         |
| Reach 2 | 783       | 100-Year | 329.00           | 58.90             | 65.02             |                   | 65.24             | 0.002443              | 3.75               | 93.90                | 29.07             | 0.37         |
| Reach 2 | 1103      | 2-Year   | 74.00            | 61.08             | 63.46             |                   | 63.61             | 0.004635              | 3.14               | 23.60                | 16.26             | 0.46         |
| Reach 2 | 1103      | 10-Year  | 154.00           | 61.08             | 64.50             |                   | 64.70             | 0.003893              | 3.57               | 43.09                | 21.26             | 0.44         |
| Reach 2 | 1103      | 25-Year  | 214.00           | 61.08             | 65.07             |                   | 65.29             | 0.003719              | 3.83               | 55.92                | 23.99             | 0.44         |
| Reach 2 | 1103      | 50-Year  | 268.00           | 61.08             | 65.51             |                   | 65.76             | 0.003596              | 4.00               | 66.92                | 26.10             | 0.44         |
| Reach 2 | 1103      | 100-Year | 329.00           | 61.08             | 65.92             |                   | 66.19             | 0.003588              | 4.22               | 78.02                | 28.08             | 0.45         |

# FORK SWAMP UT2R2: EXISTING CONDITIONS

HEC-RAS Plan: FSUT2R2 - Ex River: Fork Swamp UT2 Reach: Reach 2 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 1537      | 2-Year   | 74.00            | 61.92             | 65.22             |                   | 65.38             | 0.003571              | 3.18               | 23.27                | 11.39             | 0.39         |
| Reach 2 | 1537      | 10-Year  | 154.00           | 61.92             | 66.36             |                   | 66.59             | 0.004863              | 3.86               | 39.89                | 19.15             | 0.47         |
| Reach 2 | 1537      | 25-Year  | 214.00           | 61.92             | 66.84             |                   | 67.10             | 0.004632              | 4.22               | 58.77                | 61.71             | 0.47         |
| Reach 2 | 1537      | 50-Year  | 268.00           | 61.92             | 67.18             | 65.94             | 67.44             | 0.004180              | 4.32               | 85.63                | 93.86             | 0.46         |
| Reach 2 | 1537      | 100-Year | 329.00           | 61.92             | 67.52             |                   | 67.75             | 0.003577              | 4.25               | 122.42               | 123.52            | 0.43         |
| Reach 2 | 1961      | 2-Year   | 101.00           | 63.79             | 67.45             |                   | 67.81             | 0.008449              | 4.82               | 20.94                | 9.73              | 0.58         |
| Reach 2 | 1961      | 10-Year  | 180.00           | 63.79             | 68.36             | 67.50             | 68.52             | 0.004300              | 3.94               | 158.26               | 536.61            | 0.43         |
| Reach 2 | 1961      | 25-Year  | 235.00           | 63.79             | 68.55             | 68.43             | 68.64             | 0.002898              | 3.35               | 267.98               | 592.61            | 0.35         |
| Reach 2 | 1961      | 50-Year  | 283.00           | 63.79             | 68.69             | 68.49             | 68.75             | 0.002327              | 3.07               | 353.93               | 644.20            | 0.32         |
| Reach 2 | 1961      | 100-Year | 336.00           | 63.79             | 68.82             |                   | 68.87             | 0.001977              | 2.89               | 440.74               | 692.43            | 0.29         |
| Reach 2 | 2341      | 2-Year   | 101.00           | 66.19             | 69.87             | 69.78             | 69.99             | 0.004072              | 3.41               | 100.08               | 362.77            | 0.40         |
| Reach 2 | 2341      | 10-Year  | 180.00           | 66.19             | 70.09             |                   | 70.20             | 0.004526              | 3.78               | 209.77               | 608.28            | 0.43         |
| Reach 2 | 2341      | 25-Year  | 235.00           | 66.19             | 70.11             | 70.11             | 70.26             | 0.006823              | 4.67               | 221.75               | 610.15            | 0.53         |
| Reach 2 | 2341      | 50-Year  | 283.00           | 66.19             | 70.15             | 70.15             | 70.31             | 0.007892              | 5.07               | 244.68               | 613.71            | 0.57         |
| Reach 2 | 2341      | 100-Year | 336.00           | 66.19             | 70.19             | 70.19             | 70.36             | 0.008715              | 5.39               | 270.81               | 617.74            | 0.60         |
| Reach 2 | 2702      | 2-Year   | 49.00            | 68.82             | 70.98             |                   | 71.01             | 0.001529              | 1.55               | 63.32                | 93.56             | 0.26         |
| Reach 2 | 2702      | 10-Year  | 90.00            | 68.82             | 71.31             |                   | 71.35             | 0.001838              | 1.97               | 98.57                | 120.34            | 0.29         |
| Reach 2 | 2702      | 25-Year  | 118.00           | 68.82             | 71.56             |                   | 71.59             | 0.001548              | 1.97               | 131.17               | 145.55            | 0.27         |
| Reach 2 | 2702      | 50-Year  | 143.00           | 68.82             | 71.70             |                   | 71.74             | 0.001546              | 2.07               | 153.30               | 161.04            | 0.27         |
| Reach 2 | 2702      | 100-Year | 171.00           | 68.82             | 71.83             |                   | 71.87             | 0.001598              | 2.19               | 174.82               | 174.18            | 0.28         |
| Reach 2 | 3063      | 2-Year   | 49.00            | 70.87             | 71.47             |                   | 71.48             | 0.001146              | 0.65               | 91.29                | 181.77            | 0.19         |
| Reach 2 | 3063      | 10-Year  | 90.00            | 70.87             | 71.79             |                   | 71.80             | 0.000914              | 0.74               | 173.35               | 307.58            | 0.18         |
| Reach 2 | 3063      | 25-Year  | 118.00           | 70.87             | 71.95             |                   | 71.95             | 0.000714              | 0.72               | 221.48               | 313.61            | 0.16         |
| Reach 2 | 3063      | 50-Year  | 143.00           | 70.87             | 72.07             |                   | 72.08             | 0.000619              | 0.72               | 262.79               | 356.24            | 0.15         |
| Reach 2 | 3063      | 100-Year | 171.00           | 70.87             | 72.19             |                   | 72.20             | 0.000569              | 0.73               | 306.77               | 391.99            | 0.15         |
| Reach 2 | 3304      | 2-Year   | 49.00            | 69.69             | 71.49             |                   | 71.49             | 0.000010              | 0.12               | 440.29               | 442.90            | 0.02         |
| Reach 2 | 3304      | 10-Year  | 90.00            | 69.69             | 71.81             |                   | 71.81             | 0.000014              | 0.17               | 590.73               | 492.80            | 0.03         |
| Reach 2 | 3304      | 25-Year  | 118.00           | 69.69             | 71.96             |                   | 71.97             | 0.000017              | 0.20               | 669.66               | 516.27            | 0.03         |
| Reach 2 | 3304      | 50-Year  | 143.00           | 69.69             | 72.09             |                   | 72.09             | 0.000026              | 0.25               | 777.98               | 973.39            | 0.04         |
| Reach 2 | 3304      | 100-Year | 171.00           | 69.69             | 72.21             |                   | 72.21             | 0.000027              | 0.27               | 895.41               | 1019.20           | 0.04         |
| Reach 2 | 3669      | 2-Year   | 49.00            | 68.21             | 71.49             |                   | 71.49             | 0.000033              | 0.35               | 247.90               | 267.30            | 0.04         |
| Reach 2 | 3669      | 10-Year  | 90.00            | 68.21             | 71.82             |                   | 71.82             | 0.000045              | 0.46               | 341.28               | 309.20            | 0.05         |

# FORK SWAMP UT2R2: EXISTING CONDITIONS

HEC-RAS Plan: FSUT2R2 - Ex River: Fork Swamp UT2 Reach: Reach 2 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 3669      | 25-Year  | 118.00           | 68.21             | 71.97             |                   | 71.98             | 0.000052              | 0.51               | 391.64               | 328.88            | 0.05         |
| Reach 2 | 3669      | 50-Year  | 143.00           | 68.21             | 72.11             |                   | 72.11             | 0.000057              | 0.55               | 454.38               | 510.41            | 0.06         |
| Reach 2 | 3669      | 100-Year | 171.00           | 68.21             | 72.22             |                   | 72.23             | 0.000061              | 0.58               | 515.15               | 517.34            | 0.06         |
| Reach 2 | 4005      | 2-Year   | 49.00            | 65.68             | 71.50             |                   | 71.50             | 0.000003              | 0.16               | 565.41               | 406.09            | 0.01         |
| Reach 2 | 4005      | 10-Year  | 90.00            | 65.68             | 71.82             |                   | 71.82             | 0.000006              | 0.23               | 700.22               | 421.80            | 0.02         |
| Reach 2 | 4005      | 25-Year  | 118.00           | 65.68             | 71.98             |                   | 71.98             | 0.000008              | 0.27               | 768.02               | 429.49            | 0.02         |
| Reach 2 | 4005      | 50-Year  | 143.00           | 65.68             | 72.11             |                   | 72.12             | 0.000010              | 0.31               | 862.48               | 758.77            | 0.03         |
| Reach 2 | 4005      | 100-Year | 171.00           | 65.68             | 72.23             |                   | 72.23             | 0.000012              | 0.34               | 953.93               | 774.47            | 0.03         |
| Reach 2 | 4262      | 2-Year   | 49.00            | 64.48             | 71.50             |                   | 71.50             | 0.000002              | 0.15               | 742.19               | 369.40            | 0.01         |
| Reach 2 | 4262      | 10-Year  | 90.00            | 64.48             | 71.82             |                   | 71.82             | 0.000004              | 0.23               | 863.43               | 373.67            | 0.02         |
| Reach 2 | 4262      | 25-Year  | 118.00           | 64.48             | 71.98             |                   | 71.98             | 0.000006              | 0.28               | 923.30               | 375.76            | 0.02         |
| Reach 2 | 4262      | 50-Year  | 143.00           | 64.48             | 72.12             |                   | 72.12             | 0.000008              | 0.32               | 973.88               | 377.52            | 0.02         |
| Reach 2 | 4262      | 100-Year | 171.00           | 64.48             | 72.24             |                   | 72.24             | 0.000010              | 0.37               | 1019.18              | 379.09            | 0.03         |

# FORK SWAMP UT3: EXISTING CONDITIONS

HEC-RAS Plan: FSUT3 - Ex

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 3 | 237.0     | 2 YR    | 396.00           | 45.84             | 50.57             | 49.61             | 50.70             | 0.003506              | 3.66               | 465.28               | 803.60            | 0.36         |
| Reach 3 | 237.0     | 10 YR   | 792.00           | 45.84             | 51.13             | 50.68             | 51.24             | 0.003502              | 4.06               | 1068.40              | 1366.07           | 0.37         |
| Reach 3 | 237.0     | 25 YR   | 1066.00          | 45.84             | 51.36             | 50.89             | 51.46             | 0.003502              | 4.23               | 1398.32              | 1514.21           | 0.37         |
| Reach 3 | 237.0     | 50 YR   | 1325.00          | 45.84             | 51.55             | 51.02             | 51.63             | 0.003500              | 4.35               | 1688.42              | 1633.41           | 0.37         |
| Reach 3 | 237.0     | 100 YR  | 1604.00          | 45.84             | 51.71             | 51.18             | 51.80             | 0.003505              | 4.47               | 1969.98              | 1715.82           | 0.38         |
| Reach 3 | 614.5     | 2 YR    | 396.00           | 47.18             | 51.43             |                   | 51.45             | 0.001258              | 1.97               | 887.67               | 892.69            | 0.21         |
| Reach 3 | 614.5     | 10 YR   | 792.00           | 47.18             | 52.01             |                   | 52.03             | 0.001378              | 2.34               | 1435.87              | 1017.39           | 0.23         |
| Reach 3 | 614.5     | 25 YR   | 1066.00          | 47.18             | 52.31             |                   | 52.33             | 0.001618              | 2.68               | 1758.54              | 1202.54           | 0.25         |
| Reach 3 | 614.5     | 50 YR   | 1325.00          | 47.18             | 52.53             |                   | 52.56             | 0.001786              | 2.93               | 2041.58              | 1299.51           | 0.26         |
| Reach 3 | 614.5     | 100 YR  | 1604.00          | 47.18             | 52.71             |                   | 52.74             | 0.001868              | 3.09               | 2283.97              | 1311.50           | 0.27         |
| Reach 3 | 1000.0    | 2 YR    | 396.00           | 47.70             | 51.98             |                   | 52.01             | 0.001726              | 2.32               | 879.28               | 1243.25           | 0.24         |
| Reach 3 | 1000.0    | 10 YR   | 792.00           | 47.70             | 52.54             |                   | 52.56             | 0.001373              | 2.34               | 1623.10              | 1391.82           | 0.23         |
| Reach 3 | 1000.0    | 25 YR   | 1066.00          | 47.70             | 52.86             |                   | 52.88             | 0.001234              | 2.36               | 2077.40              | 1440.25           | 0.22         |
| Reach 3 | 1000.0    | 50 YR   | 1325.00          | 47.70             | 53.10             |                   | 53.12             | 0.001213              | 2.44               | 2436.26              | 1520.30           | 0.22         |
| Reach 3 | 1000.0    | 100 YR  | 1604.00          | 47.70             | 53.31             |                   | 53.33             | 0.001253              | 2.56               | 2750.81              | 1553.99           | 0.22         |
| Reach 3 | 1481.0    | 2 YR    | 396.00           | 47.90             | 52.74             |                   | 52.78             | 0.001462              | 2.41               | 701.91               | 738.58            | 0.23         |
| Reach 3 | 1481.0    | 10 YR   | 792.00           | 47.90             | 53.28             |                   | 53.33             | 0.001842              | 2.99               | 1118.11              | 791.47            | 0.27         |
| Reach 3 | 1481.0    | 25 YR   | 1066.00          | 47.90             | 53.58             |                   | 53.63             | 0.002001              | 3.28               | 1375.84              | 898.08            | 0.28         |
| Reach 3 | 1481.0    | 50 YR   | 1325.00          | 47.90             | 53.83             |                   | 53.88             | 0.002082              | 3.47               | 1603.05              | 930.66            | 0.29         |
| Reach 3 | 1481.0    | 100 YR  | 1604.00          | 47.90             | 54.06             |                   | 54.12             | 0.002172              | 3.67               | 1822.36              | 961.07            | 0.30         |
| Reach 3 | 1948.0    | 2 YR    | 396.00           | 48.10             | 53.16             |                   | 53.17             | 0.000538              | 1.53               | 995.53               | 612.73            | 0.14         |
| Reach 3 | 1948.0    | 10 YR   | 792.00           | 48.10             | 53.84             |                   | 53.85             | 0.000758              | 2.04               | 1414.98              | 627.66            | 0.17         |
| Reach 3 | 1948.0    | 25 YR   | 1066.00          | 48.10             | 54.20             |                   | 54.22             | 0.000868              | 2.30               | 1645.51              | 636.40            | 0.19         |
| Reach 3 | 1948.0    | 50 YR   | 1325.00          | 48.10             | 54.50             |                   | 54.52             | 0.000961              | 2.52               | 1834.13              | 643.69            | 0.20         |
| Reach 3 | 1948.0    | 100 YR  | 1604.00          | 48.10             | 54.77             |                   | 54.80             | 0.001056              | 2.74               | 2014.64              | 651.64            | 0.21         |
| Reach 3 | 2532.0    | 2 YR    | 365.00           | 48.25             | 53.63             |                   | 53.84             | 0.003161              | 3.92               | 249.51               | 407.72            | 0.35         |
| Reach 3 | 2532.0    | 10 YR   | 725.00           | 48.25             | 54.48             |                   | 54.64             | 0.002828              | 4.23               | 644.53               | 495.26            | 0.34         |
| Reach 3 | 2532.0    | 25 YR   | 969.00           | 48.25             | 54.92             |                   | 55.06             | 0.002667              | 4.36               | 863.37               | 520.64            | 0.34         |
| Reach 3 | 2532.0    | 50 YR   | 1208.00          | 48.25             | 55.27             |                   | 55.41             | 0.002648              | 4.54               | 1052.20              | 553.22            | 0.34         |
| Reach 3 | 2532.0    | 100 YR  | 1459.00          | 48.25             | 55.60             |                   | 55.74             | 0.002630              | 4.70               | 1242.03              | 586.66            | 0.34         |
| Reach 3 | 3000.0    | 2 YR    | 365.00           | 48.35             | 54.71             |                   | 54.86             | 0.001578              | 3.22               | 189.60               | 80.72             | 0.26         |
| Reach 3 | 3000.0    | 10 YR   | 725.00           | 48.35             | 55.73             |                   | 56.05             | 0.002992              | 5.03               | 308.39               | 170.33            | 0.37         |

# FORK SWAMP UT3: EXISTING CONDITIONS

HEC-RAS Plan: FSUT3 - Ex (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 3 | 3000.0    | 25 YR   | 969.00           | 48.35             | 56.19             |                   | 56.65             | 0.003908              | 6.04               | 411.19               | 282.63            | 0.42         |
| Reach 3 | 3000.0    | 50 YR   | 1208.00          | 48.35             | 56.57             | 54.64             | 57.06             | 0.004236              | 6.54               | 521.74               | 308.25            | 0.44         |
| Reach 3 | 3000.0    | 100 YR  | 1459.00          | 48.35             | 56.91             | 54.79             | 57.43             | 0.004475              | 6.95               | 632.25               | 331.92            | 0.46         |
| Reach 3 | 3500.0    | 2 YR    | 365.00           | 48.57             | 55.49             |                   | 55.61             | 0.001421              | 2.79               | 146.87               | 114.42            | 0.24         |
| Reach 3 | 3500.0    | 10 YR   | 725.00           | 48.57             | 56.94             |                   | 57.10             | 0.001513              | 3.50               | 418.29               | 214.33            | 0.26         |
| Reach 3 | 3500.0    | 25 YR   | 969.00           | 48.57             | 57.65             |                   | 57.83             | 0.001511              | 3.79               | 582.44               | 248.05            | 0.26         |
| Reach 3 | 3500.0    | 50 YR   | 1208.00          | 48.57             | 58.14             |                   | 58.33             | 0.001626              | 4.12               | 710.36               | 296.81            | 0.28         |
| Reach 3 | 3500.0    | 100 YR  | 1459.00          | 48.57             | 58.57             |                   | 58.77             | 0.001732              | 4.43               | 847.10               | 340.04            | 0.29         |
| Reach 3 | 3830.0    | 2 YR    | 365.00           | 49.16             | 55.97             |                   | 56.09             | 0.001509              | 2.83               | 150.56               | 69.88             | 0.24         |
| Reach 3 | 3830.0    | 10 YR   | 725.00           | 49.16             | 57.45             |                   | 57.59             | 0.001429              | 3.37               | 496.72               | 362.50            | 0.25         |
| Reach 3 | 3830.0    | 25 YR   | 969.00           | 49.16             | 58.16             |                   | 58.28             | 0.001232              | 3.39               | 796.08               | 484.94            | 0.24         |
| Reach 3 | 3830.0    | 50 YR   | 1208.00          | 49.16             | 58.67             |                   | 58.78             | 0.001125              | 3.41               | 1102.54              | 688.25            | 0.23         |
| Reach 3 | 3830.0    | 100 YR  | 1459.00          | 49.16             | 59.12             |                   | 59.22             | 0.001030              | 3.40               | 1428.35              | 742.12            | 0.22         |
| Reach 3 | 4129.0    | 2 YR    | 365.00           | 49.79             | 56.44             |                   | 56.56             | 0.001650              | 2.88               | 149.69               | 60.88             | 0.25         |
| Reach 3 | 4129.0    | 10 YR   | 725.00           | 49.79             | 57.90             |                   | 58.11             | 0.001992              | 3.90               | 256.86               | 86.00             | 0.29         |
| Reach 3 | 4129.0    | 25 YR   | 969.00           | 49.79             | 58.54             |                   | 58.84             | 0.002447              | 4.65               | 328.00               | 204.53            | 0.33         |
| Reach 3 | 4129.0    | 50 YR   | 1208.00          | 49.79             | 59.00             |                   | 59.36             | 0.002766              | 5.19               | 472.51               | 384.27            | 0.36         |
| Reach 3 | 4129.0    | 100 YR  | 1459.00          | 49.79             | 59.42             |                   | 59.77             | 0.002745              | 5.38               | 661.23               | 500.70            | 0.36         |
| Reach 3 | 4545      | 2 YR    | 365.00           | 49.53             | 56.96             |                   | 57.02             | 0.000779              | 2.08               | 216.15               | 128.04            | 0.18         |
| Reach 3 | 4545      | 10 YR   | 725.00           | 49.53             | 58.49             |                   | 58.54             | 0.000587              | 2.17               | 802.79               | 661.51            | 0.16         |
| Reach 3 | 4545      | 25 YR   | 969.00           | 49.53             | 59.17             |                   | 59.20             | 0.000407              | 1.95               | 1275.19              | 718.29            | 0.14         |
| Reach 3 | 4545      | 50 YR   | 1208.00          | 49.53             | 59.67             |                   | 59.69             | 0.000333              | 1.86               | 1640.45              | 748.89            | 0.13         |
| Reach 3 | 4545      | 100 YR  | 1459.00          | 49.53             | 60.07             |                   | 60.09             | 0.000305              | 1.85               | 1942.45              | 770.36            | 0.12         |
| Reach 3 | 4815      | 2 YR    | 308.00           | 49.53             | 57.16             |                   | 57.21             | 0.000601              | 1.87               | 178.51               | 68.17             | 0.16         |
| Reach 3 | 4815      | 10 YR   | 610.00           | 49.53             | 58.64             |                   | 58.72             | 0.000699              | 2.42               | 440.86               | 359.49            | 0.18         |
| Reach 3 | 4815      | 25 YR   | 810.00           | 49.53             | 59.28             |                   | 59.35             | 0.000630              | 2.46               | 694.24               | 425.93            | 0.17         |
| Reach 3 | 4815      | 50 YR   | 1012.00          | 49.53             | 59.76             |                   | 59.82             | 0.000602              | 2.52               | 906.16               | 459.24            | 0.17         |
| Reach 3 | 4815      | 100 YR  | 1220.00          | 49.53             | 60.15             |                   | 60.21             | 0.000592              | 2.60               | 1101.94              | 562.40            | 0.17         |
| Reach 3 | 4953      | 2 YR    | 308.00           | 49.00             | 57.24             | 51.80             | 57.28             | 0.000366              | 1.56               | 197.13               | 39.08             | 0.12         |
| Reach 3 | 4953      | 10 YR   | 610.00           | 49.00             | 58.73             | 53.03             | 58.81             | 0.000567              | 2.29               | 345.38               | 190.41            | 0.16         |
| Reach 3 | 4953      | 25 YR   | 810.00           | 49.00             | 59.35             | 53.68             | 59.44             | 0.000615              | 2.54               | 552.90               | 375.89            | 0.17         |
| Reach 3 | 4953      | 50 YR   | 1012.00          | 49.00             | 59.83             | 54.25             | 59.92             | 0.000636              | 2.69               | 741.13               | 415.58            | 0.17         |

# FORK SWAMP UT3: EXISTING CONDITIONS

HEC-RAS Plan: FSUT3 - Ex (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 3 | 4953      | 100 YR  | 1220.00          | 49.00             | 60.22             | 54.77             | 60.31             | 0.000658              | 2.83               | 909.47               | 446.71            | 0.18         |
| Reach 3 | 5065      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 3 | 5206      | 2 YR    | 308.00           | 50.65             | 57.48             | 53.72             | 57.54             | 0.000742              | 1.98               | 157.87               | 106.52            | 0.17         |
| Reach 3 | 5206      | 10 YR   | 610.00           | 50.65             | 59.74             | 54.88             | 59.76             | 0.000122              | 1.08               | 580.14               | 241.75            | 0.08         |
| Reach 3 | 5206      | 25 YR   | 810.00           | 50.65             | 60.20             | 55.48             | 60.22             | 0.000121              | 1.13               | 694.46               | 264.14            | 0.08         |
| Reach 3 | 5206      | 50 YR   | 1012.00          | 50.65             | 60.49             | 56.00             | 60.52             | 0.000134              | 1.22               | 775.18               | 285.38            | 0.08         |
| Reach 3 | 5206      | 100 YR  | 1220.00          | 50.65             | 60.72             | 56.48             | 60.76             | 0.000151              | 1.32               | 843.51               | 310.45            | 0.09         |
| Reach 3 | 5363      | 2 YR    | 298.00           | 50.34             | 57.59             |                   | 57.66             | 0.000759              | 1.99               | 154.11               | 74.45             | 0.17         |
| Reach 3 | 5363      | 10 YR   | 592.00           | 50.34             | 59.76             |                   | 59.81             | 0.000429              | 1.98               | 526.86               | 257.87            | 0.14         |
| Reach 3 | 5363      | 25 YR   | 787.00           | 50.34             | 60.21             |                   | 60.27             | 0.000508              | 2.25               | 652.42               | 289.92            | 0.15         |
| Reach 3 | 5363      | 50 YR   | 982.00           | 50.34             | 60.51             |                   | 60.58             | 0.000609              | 2.54               | 739.86               | 300.90            | 0.17         |
| Reach 3 | 5363      | 100 YR  | 1184.00          | 50.34             | 60.74             |                   | 60.83             | 0.000727              | 2.83               | 810.77               | 309.51            | 0.19         |
| Reach 3 | 5832      | 2 YR    | 298.00           | 50.38             | 57.97             |                   | 58.04             | 0.000851              | 2.14               | 139.50               | 32.35             | 0.18         |
| Reach 3 | 5832      | 10 YR   | 592.00           | 50.38             | 59.99             |                   | 60.08             | 0.000765              | 2.50               | 318.09               | 148.86            | 0.18         |
| Reach 3 | 5832      | 25 YR   | 787.00           | 50.38             | 60.49             |                   | 60.60             | 0.000900              | 2.86               | 404.72               | 195.02            | 0.20         |
| Reach 3 | 5832      | 50 YR   | 982.00           | 50.38             | 60.84             |                   | 60.96             | 0.001020              | 3.16               | 475.43               | 213.70            | 0.21         |
| Reach 3 | 5832      | 100 YR  | 1184.00          | 50.38             | 61.13             |                   | 61.26             | 0.001134              | 3.42               | 539.35               | 229.28            | 0.23         |
| Reach 3 | 6307      | 2 YR    | 298.00           | 50.89             | 58.45             |                   | 58.56             | 0.001399              | 2.60               | 114.46               | 27.81             | 0.23         |
| Reach 3 | 6307      | 10 YR   | 592.00           | 50.89             | 60.42             |                   | 60.56             | 0.001276              | 3.09               | 269.63               | 169.38            | 0.23         |
| Reach 3 | 6307      | 25 YR   | 787.00           | 50.89             | 60.98             |                   | 61.12             | 0.001299              | 3.31               | 379.30               | 218.45            | 0.23         |
| Reach 3 | 6307      | 50 YR   | 982.00           | 50.89             | 61.37             |                   | 61.51             | 0.001291              | 3.44               | 471.60               | 252.02            | 0.24         |
| Reach 3 | 6307      | 100 YR  | 1184.00          | 50.89             | 61.70             |                   | 61.83             | 0.001272              | 3.53               | 564.98               | 313.32            | 0.24         |
| Reach 3 | 6769      | 2 YR    | 298.00           | 51.67             | 59.03             |                   | 59.11             | 0.001034              | 2.32               | 128.60               | 30.06             | 0.20         |
| Reach 3 | 6769      | 10 YR   | 592.00           | 51.67             | 61.00             |                   | 61.12             | 0.001166              | 2.91               | 256.84               | 145.89            | 0.22         |
| Reach 3 | 6769      | 25 YR   | 787.00           | 51.67             | 61.57             |                   | 61.72             | 0.001292              | 3.28               | 354.08               | 193.16            | 0.23         |
| Reach 3 | 6769      | 50 YR   | 982.00           | 51.67             | 61.98             |                   | 62.14             | 0.001425              | 3.59               | 436.38               | 246.94            | 0.25         |
| Reach 3 | 6769      | 100 YR  | 1184.00          | 51.67             | 62.31             |                   | 62.48             | 0.001477              | 3.78               | 540.41               | 332.49            | 0.25         |
| Reach 2 | 7068      | 2 YR    | 159.00           | 52.43             | 59.32             |                   | 59.36             | 0.000558              | 1.59               | 99.73                | 25.06             | 0.14         |
| Reach 2 | 7068      | 10 YR   | 302.00           | 52.43             | 61.34             |                   | 61.39             | 0.000569              | 1.93               | 160.10               | 45.25             | 0.15         |
| Reach 2 | 7068      | 25 YR   | 392.00           | 52.43             | 61.95             |                   | 62.02             | 0.000639              | 2.20               | 196.01               | 113.29            | 0.16         |
| Reach 2 | 7068      | 50 YR   | 487.00           | 52.43             | 62.39             |                   | 62.46             | 0.000576              | 2.19               | 306.33               | 291.56            | 0.15         |

# FORK SWAMP UT3: EXISTING CONDITIONS

HEC-RAS Plan: FSUT3 - Ex (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 7068      | 100 YR  | 583.00           | 52.43             | 62.72             |                   | 62.78             | 0.000492              | 2.10               | 406.72               | 305.82            | 0.14         |
| Reach 2 | 7210      | 2 YR    | 159.00           | 52.66             | 59.40             | 55.28             | 59.44             | 0.000513              | 1.53               | 104.22               | 27.01             | 0.14         |
| Reach 2 | 7210      | 10 YR   | 302.00           | 52.66             | 61.42             | 56.24             | 61.47             | 0.000495              | 1.81               | 177.86               | 73.72             | 0.14         |
| Reach 2 | 7210      | 25 YR   | 392.00           | 52.66             | 62.05             | 56.72             | 62.11             | 0.000525              | 2.02               | 253.04               | 312.86            | 0.15         |
| Reach 2 | 7210      | 50 YR   | 487.00           | 52.66             | 62.48             | 57.17             | 62.53             | 0.000443              | 1.94               | 396.58               | 345.55            | 0.14         |
| Reach 2 | 7210      | 100 YR  | 583.00           | 52.66             | 62.80             | 57.56             | 62.84             | 0.000379              | 1.86               | 510.64               | 367.59            | 0.13         |
| Reach 2 | 7287      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 7363      | 2 YR    | 159.00           | 54.55             | 59.81             | 56.66             | 59.87             | 0.000892              | 1.88               | 84.58                | 24.50             | 0.18         |
| Reach 2 | 7363      | 10 YR   | 302.00           | 54.55             | 62.13             | 57.53             | 62.19             | 0.000594              | 1.99               | 172.94               | 101.28            | 0.15         |
| Reach 2 | 7363      | 25 YR   | 392.00           | 54.55             | 62.49             | 57.97             | 62.57             | 0.000747              | 2.33               | 215.12               | 125.85            | 0.18         |
| Reach 2 | 7363      | 50 YR   | 487.00           | 54.55             | 62.75             | 58.39             | 62.85             | 0.000931              | 2.68               | 249.35               | 140.41            | 0.20         |
| Reach 2 | 7363      | 100 YR  | 583.00           | 54.55             | 62.93             | 58.77             | 63.06             | 0.001148              | 3.04               | 276.41               | 162.71            | 0.22         |
| Reach 2 | 7530      | 2 YR    | 159.00           | 54.56             | 59.96             |                   | 60.01             | 0.000758              | 1.75               | 90.82                | 26.22             | 0.17         |
| Reach 2 | 7530      | 10 YR   | 302.00           | 54.56             | 62.23             |                   | 62.28             | 0.000469              | 1.77               | 224.74               | 171.00            | 0.14         |
| Reach 2 | 7530      | 25 YR   | 392.00           | 54.56             | 62.63             |                   | 62.68             | 0.000497              | 1.92               | 293.54               | 182.22            | 0.14         |
| Reach 2 | 7530      | 50 YR   | 487.00           | 54.56             | 62.93             |                   | 62.98             | 0.000540              | 2.07               | 356.00               | 242.70            | 0.15         |
| Reach 2 | 7530      | 100 YR  | 583.00           | 54.56             | 63.15             |                   | 63.21             | 0.000585              | 2.21               | 415.73               | 288.56            | 0.16         |
| Reach 2 | 7641      | 2 YR    | 159.00           | 55.18             | 60.05             | 57.28             | 60.11             | 0.001066              | 1.95               | 81.39                | 26.19             | 0.20         |
| Reach 2 | 7641      | 10 YR   | 302.00           | 55.18             | 62.29             | 58.12             | 62.34             | 0.000655              | 1.95               | 195.06               | 188.78            | 0.16         |
| Reach 2 | 7641      | 25 YR   | 392.00           | 55.18             | 62.69             | 58.54             | 62.75             | 0.000641              | 2.03               | 290.52               | 258.50            | 0.16         |
| Reach 2 | 7641      | 50 YR   | 487.00           | 55.18             | 63.00             | 58.94             | 63.05             | 0.000616              | 2.07               | 371.71               | 275.43            | 0.16         |
| Reach 2 | 7641      | 100 YR  | 583.00           | 55.18             | 63.23             | 59.30             | 63.28             | 0.000621              | 2.14               | 437.17               | 288.37            | 0.16         |
| Reach 2 | 7694      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 7753      | 2 YR    | 159.00           | 55.77             | 60.62             | 57.54             | 60.66             | 0.000675              | 1.62               | 98.10                | 30.02             | 0.16         |
| Reach 2 | 7753      | 10 YR   | 302.00           | 55.77             | 63.02             | 58.30             | 63.05             | 0.000365              | 1.55               | 252.61               | 158.39            | 0.12         |
| Reach 2 | 7753      | 25 YR   | 392.00           | 55.77             | 63.29             | 58.69             | 63.34             | 0.000476              | 1.83               | 303.95               | 219.16            | 0.14         |
| Reach 2 | 7753      | 50 YR   | 487.00           | 55.77             | 63.45             | 59.06             | 63.51             | 0.000628              | 2.15               | 340.79               | 247.01            | 0.16         |
| Reach 2 | 7753      | 100 YR  | 583.00           | 55.77             | 63.58             | 59.40             | 63.66             | 0.000785              | 2.44               | 374.68               | 269.53            | 0.18         |
| Reach 2 | 7901      | 2 YR    | 142.00           | 54.62             | 60.71             |                   | 60.75             | 0.000534              | 1.52               | 93.18                | 24.81             | 0.14         |
| Reach 2 | 7901      | 10 YR   | 260.00           | 54.62             | 63.08             |                   | 63.10             | 0.000176              | 1.09               | 462.83               | 325.90            | 0.08         |

# FORK SWAMP UT3: EXISTING CONDITIONS

HEC-RAS Plan: FSUT3 - Ex (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 7901      | 25 YR   | 331.00           | 54.62             | 63.38             |                   | 63.39             | 0.000191              | 1.17               | 564.45               | 362.82            | 0.09         |
| Reach 2 | 7901      | 50 YR   | 409.00           | 54.62             | 63.56             |                   | 63.58             | 0.000223              | 1.30               | 632.27               | 368.65            | 0.10         |
| Reach 2 | 7901      | 100 YR  | 486.00           | 54.62             | 63.72             |                   | 63.74             | 0.000252              | 1.40               | 691.53               | 373.67            | 0.10         |
| Reach 2 | 8186      | 2 YR    | 142.00           | 56.86             | 60.91             | 58.52             | 60.96             | 0.001021              | 1.79               | 79.17                | 28.84             | 0.19         |
| Reach 2 | 8186      | 10 YR   | 260.00           | 56.86             | 63.15             | 59.17             | 63.19             | 0.000550              | 1.68               | 154.54               | 45.88             | 0.15         |
| Reach 2 | 8186      | 25 YR   | 331.00           | 56.86             | 63.45             | 59.50             | 63.51             | 0.000728              | 1.99               | 166.23               | 67.77             | 0.17         |
| Reach 2 | 8186      | 50 YR   | 409.00           | 56.86             | 63.65             | 59.81             | 63.73             | 0.000929              | 2.30               | 187.15               | 95.16             | 0.19         |
| Reach 2 | 8186      | 100 YR  | 486.00           | 56.86             | 63.81             | 60.10             | 63.91             | 0.001105              | 2.56               | 210.97               | 189.56            | 0.21         |
| Reach 2 | 8238      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 8296      | 2 YR    | 142.00           | 57.00             | 61.69             | 58.77             | 61.72             | 0.000610              | 1.45               | 97.95                | 33.64             | 0.15         |
| Reach 2 | 8296      | 10 YR   | 260.00           | 57.00             | 64.09             | 59.44             | 64.12             | 0.000283              | 1.31               | 233.25               | 273.88            | 0.11         |
| Reach 2 | 8296      | 25 YR   | 331.00           | 57.00             | 64.25             | 59.76             | 64.29             | 0.000361              | 1.51               | 280.49               | 310.12            | 0.12         |
| Reach 2 | 8296      | 50 YR   | 409.00           | 57.00             | 64.35             | 60.08             | 64.40             | 0.000463              | 1.73               | 312.37               | 317.09            | 0.14         |
| Reach 2 | 8296      | 100 YR  | 486.00           | 57.00             | 64.44             | 60.36             | 64.49             | 0.000556              | 1.92               | 341.13               | 320.53            | 0.16         |
| Reach 2 | 8514      | 2 YR    | 89.00            | 55.88             | 61.75             |                   | 61.76             | 0.000044              | 0.43               | 155.92               | 81.76             | 0.04         |
| Reach 2 | 8514      | 10 YR   | 163.00           | 55.88             | 64.13             |                   | 64.13             | 0.000005              | 0.18               | 464.42               | 231.68            | 0.01         |
| Reach 2 | 8514      | 25 YR   | 202.00           | 55.88             | 64.30             |                   | 64.30             | 0.000006              | 0.20               | 508.31               | 263.37            | 0.02         |
| Reach 2 | 8514      | 50 YR   | 250.00           | 55.88             | 64.41             |                   | 64.42             | 0.000008              | 0.23               | 538.19               | 265.52            | 0.02         |
| Reach 2 | 8514      | 100 YR  | 295.00           | 55.88             | 64.51             |                   | 64.52             | 0.000010              | 0.26               | 565.16               | 267.40            | 0.02         |
| Reach 2 | 8701      | 2 YR    | 89.00            | 57.57             | 61.77             | 58.85             | 61.78             | 0.000349              | 1.07               | 83.51                | 29.62             | 0.11         |
| Reach 2 | 8701      | 10 YR   | 163.00           | 57.57             | 64.12             | 59.36             | 64.14             | 0.000181              | 0.98               | 165.80               | 45.30             | 0.09         |
| Reach 2 | 8701      | 25 YR   | 202.00           | 57.57             | 64.29             | 59.58             | 64.31             | 0.000247              | 1.17               | 174.68               | 60.02             | 0.10         |
| Reach 2 | 8701      | 50 YR   | 250.00           | 57.57             | 64.40             | 59.82             | 64.43             | 0.000347              | 1.39               | 181.84               | 69.66             | 0.12         |
| Reach 2 | 8701      | 100 YR  | 295.00           | 57.57             | 64.50             | 60.04             | 64.54             | 0.000444              | 1.59               | 189.14               | 78.28             | 0.13         |
| Reach 2 | 8790      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 8863      | 2 YR    | 89.00            | 58.65             | 61.96             | 59.74             | 61.97             | 0.000451              | 1.13               | 78.64                | 31.27             | 0.13         |
| Reach 2 | 8863      | 10 YR   | 163.00           | 58.65             | 64.72             | 60.14             | 64.73             | 0.000145              | 0.91               | 179.15               | 52.06             | 0.08         |
| Reach 2 | 8863      | 25 YR   | 202.00           | 58.65             | 64.96             | 60.32             | 64.98             | 0.000186              | 1.06               | 193.98               | 68.76             | 0.09         |
| Reach 2 | 8863      | 50 YR   | 250.00           | 58.65             | 65.16             | 60.51             | 65.18             | 0.000242              | 1.22               | 208.47               | 81.85             | 0.10         |
| Reach 2 | 8863      | 100 YR  | 295.00           | 58.65             | 65.32             | 60.69             | 65.35             | 0.000288              | 1.35               | 222.62               | 92.86             | 0.11         |



# FORK SWAMP UT3: EXISTING CONDITIONS

HEC-RAS Plan: FSUT3 - Ex (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 9043      | 2 YR    | 62.00            | 57.96             | 62.04             |                   | 62.07             | 0.000591              | 1.25               | 49.80                | 20.17             | 0.14         |
| Reach 2 | 9043      | 10 YR   | 113.00           | 57.96             | 64.75             |                   | 64.76             | 0.000195              | 0.97               | 116.15               | 28.93             | 0.09         |
| Reach 2 | 9043      | 25 YR   | 148.00           | 57.96             | 65.00             |                   | 65.02             | 0.000282              | 1.20               | 123.60               | 29.75             | 0.10         |
| Reach 2 | 9043      | 50 YR   | 178.00           | 57.96             | 65.20             |                   | 65.23             | 0.000358              | 1.37               | 129.71               | 30.41             | 0.12         |
| Reach 2 | 9043      | 100 YR  | 211.00           | 57.96             | 65.37             |                   | 65.41             | 0.000453              | 1.56               | 134.96               | 30.96             | 0.13         |
| Reach 2 | 9621      | 2 YR    | 62.00            | 59.00             | 62.08             |                   | 62.08             | 0.000003              | 0.10               | 1003.27              | 354.72            | 0.01         |
| Reach 2 | 9621      | 10 YR   | 113.00           | 59.00             | 64.76             |                   | 64.76             | 0.000001              | 0.09               | 2024.13              | 404.50            | 0.01         |
| Reach 2 | 9621      | 25 YR   | 148.00           | 59.00             | 65.03             |                   | 65.03             | 0.000001              | 0.12               | 2131.19              | 409.37            | 0.01         |
| Reach 2 | 9621      | 50 YR   | 178.00           | 59.00             | 65.24             |                   | 65.24             | 0.000002              | 0.14               | 2218.19              | 413.29            | 0.01         |
| Reach 2 | 9621      | 100 YR  | 211.00           | 59.00             | 65.42             |                   | 65.42             | 0.000002              | 0.16               | 2293.56              | 416.65            | 0.01         |
| Reach 2 | 9935      | 2 YR    | 62.00            | 59.79             | 61.96             |                   | 62.13             | 0.008731              | 3.32               | 18.65                | 13.28             | 0.49         |
| Reach 2 | 9935      | 10 YR   | 113.00           | 59.79             | 64.74             |                   | 64.78             | 0.000822              | 1.67               | 67.62                | 21.99             | 0.17         |
| Reach 2 | 9935      | 25 YR   | 148.00           | 59.79             | 64.98             |                   | 65.05             | 0.001137              | 2.02               | 73.20                | 22.77             | 0.20         |
| Reach 2 | 9935      | 50 YR   | 178.00           | 59.79             | 65.18             |                   | 65.27             | 0.001394              | 2.29               | 77.81                | 23.39             | 0.22         |
| Reach 2 | 9935      | 100 YR  | 211.00           | 59.79             | 65.35             |                   | 65.45             | 0.001714              | 2.58               | 81.75                | 23.92             | 0.25         |
| Reach 2 | 10250     | 2 YR    | 62.00            | 58.71             | 62.89             |                   | 62.93             | 0.001170              | 1.65               | 37.54                | 15.95             | 0.19         |
| Reach 2 | 10250     | 10 YR   | 113.00           | 58.71             | 64.96             |                   | 64.99             | 0.000564              | 1.47               | 76.65                | 21.88             | 0.14         |
| Reach 2 | 10250     | 25 YR   | 148.00           | 58.71             | 65.29             |                   | 65.34             | 0.000754              | 1.76               | 84.07                | 22.83             | 0.16         |
| Reach 2 | 10250     | 50 YR   | 178.00           | 58.71             | 65.56             |                   | 65.62             | 0.000902              | 1.97               | 90.25                | 23.59             | 0.18         |
| Reach 2 | 10250     | 100 YR  | 211.00           | 58.71             | 65.80             |                   | 65.88             | 0.001069              | 2.19               | 96.15                | 24.30             | 0.19         |
| Reach 2 | 10351     | 2 YR    | 62.00            | 59.76             | 63.00             | 60.93             | 63.02             | 0.000633              | 1.24               | 50.16                | 22.14             | 0.14         |
| Reach 2 | 10351     | 10 YR   | 113.00           | 59.76             | 65.02             | 61.35             | 65.04             | 0.000294              | 1.11               | 102.19               | 29.43             | 0.10         |
| Reach 2 | 10351     | 25 YR   | 148.00           | 59.76             | 65.37             | 61.60             | 65.40             | 0.000384              | 1.31               | 112.82               | 30.71             | 0.12         |
| Reach 2 | 10351     | 50 YR   | 178.00           | 59.76             | 65.65             | 61.78             | 65.69             | 0.000453              | 1.46               | 121.67               | 31.73             | 0.13         |
| Reach 2 | 10351     | 100 YR  | 211.00           | 59.76             | 65.92             | 61.98             | 65.96             | 0.000528              | 1.62               | 130.26               | 32.70             | 0.14         |
| Reach 2 | 10420     |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 10507     | 2 YR    | 62.00            | 59.70             | 63.09             | 61.50             | 63.15             | 0.002066              | 1.97               | 31.42                | 16.26             | 0.25         |
| Reach 2 | 10507     | 10 YR   | 113.00           | 59.70             | 65.51             | 62.07             | 65.54             | 0.000482              | 1.38               | 83.73                | 70.58             | 0.13         |
| Reach 2 | 10507     | 25 YR   | 148.00           | 59.70             | 66.13             | 62.39             | 66.14             | 0.000291              | 1.17               | 158.43               | 132.40            | 0.10         |
| Reach 2 | 10507     | 50 YR   | 178.00           | 59.70             | 66.45             | 62.62             | 66.46             | 0.000193              | 0.99               | 208.05               | 163.03            | 0.09         |
| Reach 2 | 10507     | 100 YR  | 211.00           | 59.70             | 66.72             | 62.86             | 66.73             | 0.000135              | 0.85               | 252.14               | 164.54            | 0.07         |

# FORK SWAMP UT3: EXISTING CONDITIONS

HEC-RAS Plan: FSUT3 - Ex (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 10695     | 2 YR    | 62.00            | 60.49             | 63.38             |                   | 63.41             | 0.000925              | 1.44               | 43.05                | 19.72             | 0.17         |
| Reach 2 | 10695     | 10 YR   | 113.00           | 60.49             | 65.60             |                   | 65.62             | 0.000347              | 1.19               | 94.76                | 26.97             | 0.11         |
| Reach 2 | 10695     | 25 YR   | 148.00           | 60.49             | 66.18             |                   | 66.21             | 0.000385              | 1.33               | 111.19               | 28.90             | 0.12         |
| Reach 2 | 10695     | 50 YR   | 178.00           | 60.49             | 66.49             |                   | 66.53             | 0.000450              | 1.48               | 120.29               | 29.91             | 0.13         |
| Reach 2 | 10695     | 100 YR  | 211.00           | 60.49             | 66.75             |                   | 66.79             | 0.000534              | 1.65               | 128.07               | 30.75             | 0.14         |
| Reach 2 | 11090     | 2 YR    | 62.00            | 60.95             | 63.84             |                   | 63.89             | 0.001580              | 1.75               | 35.45                | 18.40             | 0.22         |
| Reach 2 | 11090     | 10 YR   | 113.00           | 60.95             | 65.77             |                   | 65.80             | 0.000606              | 1.45               | 77.85                | 25.60             | 0.15         |
| Reach 2 | 11090     | 25 YR   | 148.00           | 60.95             | 66.37             |                   | 66.41             | 0.000625              | 1.58               | 93.91                | 27.84             | 0.15         |
| Reach 2 | 11090     | 50 YR   | 178.00           | 60.95             | 66.70             |                   | 66.75             | 0.000696              | 1.72               | 103.48               | 29.10             | 0.16         |
| Reach 2 | 11090     | 100 YR  | 211.00           | 60.95             | 66.99             |                   | 67.05             | 0.000787              | 1.88               | 112.11               | 30.18             | 0.17         |
| Reach 2 | 11509     | 2 YR    | 62.00            | 61.70             | 64.67             |                   | 64.75             | 0.002742              | 2.20               | 28.16                | 15.40             | 0.29         |
| Reach 2 | 11509     | 10 YR   | 113.00           | 61.70             | 66.12             |                   | 66.19             | 0.001532              | 2.08               | 54.42                | 20.72             | 0.23         |
| Reach 2 | 11509     | 25 YR   | 148.00           | 61.70             | 66.73             |                   | 66.80             | 0.001471              | 2.19               | 67.53                | 22.92             | 0.23         |
| Reach 2 | 11509     | 50 YR   | 178.00           | 61.70             | 67.09             |                   | 67.18             | 0.001539              | 2.34               | 76.20                | 24.27             | 0.23         |
| Reach 2 | 11509     | 100 YR  | 211.00           | 61.70             | 67.43             |                   | 67.52             | 0.001640              | 2.50               | 84.47                | 25.49             | 0.24         |
| Reach 2 | 11906     | 2 YR    | 62.00            | 63.69             | 67.87             | 67.87             | 68.78             | 0.082123              | 7.62               | 8.14                 | 4.56              | 1.01         |
| Reach 2 | 11906     | 10 YR   | 113.00           | 63.69             | 68.85             | 68.85             | 69.97             | 0.071236              | 8.47               | 13.35                | 6.07              | 1.01         |
| Reach 2 | 11906     | 25 YR   | 148.00           | 63.69             | 69.38             | 69.38             | 70.59             | 0.066093              | 8.85               | 16.73                | 6.87              | 1.00         |
| Reach 2 | 11906     | 50 YR   | 178.00           | 63.69             | 70.38             | 70.38             | 70.53             | 0.009579              | 4.00               | 147.40               | 377.44            | 0.40         |
| Reach 2 | 11906     | 100 YR  | 211.00           | 63.69             | 70.35             | 70.35             | 70.61             | 0.016491              | 5.21               | 134.86               | 372.18            | 0.53         |
| Reach 2 | 12134     | 2 YR    | 62.00            | 68.81             | 71.27             |                   | 71.36             | 0.004111              | 2.62               | 36.22                | 53.61             | 0.35         |
| Reach 2 | 12134     | 10 YR   | 113.00           | 68.81             | 71.67             | 71.00             | 71.73             | 0.002557              | 2.39               | 103.10               | 277.09            | 0.29         |
| Reach 2 | 12134     | 25 YR   | 148.00           | 68.81             | 71.83             |                   | 71.86             | 0.001710              | 2.05               | 151.69               | 326.81            | 0.24         |
| Reach 2 | 12134     | 50 YR   | 178.00           | 68.81             | 71.76             |                   | 71.83             | 0.003782              | 2.98               | 129.04               | 322.89            | 0.35         |
| Reach 2 | 12134     | 100 YR  | 211.00           | 68.81             | 71.87             | 71.71             | 71.92             | 0.002827              | 2.66               | 163.53               | 328.84            | 0.31         |
| Reach 1 | 36        | 2 YR    | 141.00           | 51.73             | 59.09             |                   | 59.12             | 0.000354              | 1.32               | 106.86               | 24.92             | 0.11         |
| Reach 1 | 36        | 10 YR   | 290.00           | 51.73             | 61.10             |                   | 61.13             | 0.000327              | 1.46               | 347.58               | 178.28            | 0.11         |
| Reach 1 | 36        | 25 YR   | 401.00           | 51.73             | 61.70             |                   | 61.73             | 0.000376              | 1.65               | 460.84               | 202.38            | 0.12         |
| Reach 1 | 36        | 50 YR   | 500.00           | 51.73             | 62.12             |                   | 62.16             | 0.000425              | 1.81               | 553.22               | 271.51            | 0.13         |
| Reach 1 | 36        | 100 YR  | 612.00           | 51.73             | 62.45             |                   | 62.49             | 0.000470              | 1.98               | 646.65               | 293.58            | 0.14         |
| Reach 1 | 219       | 2 YR    | 141.00           | 53.60             | 59.17             | 55.67             | 59.20             | 0.000555              | 1.48               | 95.44                | 28.40             | 0.14         |
| Reach 1 | 219       | 10 YR   | 290.00           | 53.60             | 61.17             | 56.63             | 61.22             | 0.000570              | 1.79               | 171.57               | 54.81             | 0.15         |

# FORK SWAMP UT3: EXISTING CONDITIONS

HEC-RAS Plan: FSUT3 - Ex (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 219       | 25 YR   | 401.00           | 53.60             | 61.77             | 57.17             | 61.84             | 0.000739              | 2.13               | 207.96               | 65.93             | 0.17         |
| Reach 1 | 219       | 50 YR   | 500.00           | 53.60             | 62.20             | 57.58             | 62.29             | 0.000884              | 2.40               | 253.36               | 162.25            | 0.19         |
| Reach 1 | 219       | 100 YR  | 612.00           | 53.60             | 62.54             | 58.00             | 62.64             | 0.001008              | 2.64               | 313.31               | 184.77            | 0.20         |
| Reach 1 | 289       |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 367       | 2 YR    | 141.00           | 54.13             | 59.18             | 56.11             | 59.21             | 0.000583              | 1.48               | 95.36                | 30.18             | 0.15         |
| Reach 1 | 367       | 10 YR   | 290.00           | 54.13             | 61.26             | 56.93             | 61.30             | 0.000537              | 1.74               | 167.13               | 38.77             | 0.15         |
| Reach 1 | 367       | 25 YR   | 401.00           | 54.13             | 61.96             | 57.41             | 62.03             | 0.000673              | 2.05               | 195.45               | 41.68             | 0.17         |
| Reach 1 | 367       | 50 YR   | 500.00           | 54.13             | 62.44             | 57.79             | 62.53             | 0.000799              | 2.31               | 216.80               | 137.50            | 0.18         |
| Reach 1 | 367       | 100 YR  | 612.00           | 54.13             | 62.81             | 58.17             | 62.92             | 0.000963              | 2.62               | 243.38               | 167.33            | 0.20         |
| Reach 1 | 468       | 2 YR    | 141.00           | 54.53             | 59.24             |                   | 59.29             | 0.000907              | 1.80               | 78.51                | 24.86             | 0.18         |
| Reach 1 | 468       | 10 YR   | 290.00           | 54.53             | 61.31             |                   | 61.38             | 0.000845              | 2.11               | 137.42               | 31.97             | 0.18         |
| Reach 1 | 468       | 25 YR   | 401.00           | 54.53             | 62.03             |                   | 62.13             | 0.001052              | 2.49               | 161.20               | 34.43             | 0.20         |
| Reach 1 | 468       | 50 YR   | 500.00           | 54.53             | 62.52             |                   | 62.65             | 0.001241              | 2.80               | 178.64               | 36.12             | 0.22         |
| Reach 1 | 468       | 100 YR  | 612.00           | 54.53             | 62.91             |                   | 63.06             | 0.001518              | 3.18               | 192.68               | 37.43             | 0.25         |
| Reach 1 | 981       | 2 YR    | 134.00           | 54.12             | 59.61             |                   | 59.64             | 0.000520              | 1.46               | 91.75                | 26.05             | 0.14         |
| Reach 1 | 981       | 10 YR   | 277.00           | 54.12             | 61.68             |                   | 61.74             | 0.000559              | 1.81               | 152.78               | 32.70             | 0.15         |
| Reach 1 | 981       | 25 YR   | 383.00           | 54.12             | 62.49             |                   | 62.56             | 0.000685              | 2.13               | 180.23               | 35.28             | 0.17         |
| Reach 1 | 981       | 50 YR   | 478.00           | 54.12             | 63.07             |                   | 63.16             | 0.000795              | 2.38               | 201.11               | 37.13             | 0.18         |
| Reach 1 | 981       | 100 YR  | 584.00           | 54.12             | 63.56             |                   | 63.67             | 0.000934              | 2.66               | 219.87               | 38.71             | 0.20         |
| Reach 1 | 1414      | 2 YR    | 134.00           | 55.23             | 59.89             |                   | 59.94             | 0.000944              | 1.84               | 72.88                | 22.64             | 0.18         |
| Reach 1 | 1414      | 10 YR   | 277.00           | 55.23             | 61.97             |                   | 62.05             | 0.000905              | 2.19               | 126.41               | 28.79             | 0.18         |
| Reach 1 | 1414      | 25 YR   | 383.00           | 55.23             | 62.84             |                   | 62.93             | 0.001046              | 2.51               | 152.37               | 31.33             | 0.20         |
| Reach 1 | 1414      | 50 YR   | 478.00           | 55.23             | 63.46             |                   | 63.58             | 0.001167              | 2.77               | 172.52               | 33.18             | 0.21         |
| Reach 1 | 1414      | 100 YR  | 584.00           | 55.23             | 64.02             |                   | 64.16             | 0.001318              | 3.05               | 191.43               | 34.82             | 0.23         |
| Reach 1 | 1933      | 2 YR    | 134.00           | 55.85             | 60.38             |                   | 60.43             | 0.000916              | 1.74               | 76.95                | 26.51             | 0.18         |
| Reach 1 | 1933      | 10 YR   | 277.00           | 55.85             | 62.42             |                   | 62.48             | 0.000782              | 1.98               | 139.80               | 34.98             | 0.17         |
| Reach 1 | 1933      | 25 YR   | 383.00           | 55.85             | 63.34             |                   | 63.42             | 0.000834              | 2.20               | 173.76               | 38.80             | 0.18         |
| Reach 1 | 1933      | 50 YR   | 478.00           | 55.85             | 64.02             |                   | 64.11             | 0.000881              | 2.38               | 200.88               | 41.59             | 0.19         |
| Reach 1 | 1933      | 100 YR  | 584.00           | 55.85             | 64.64             |                   | 64.74             | 0.000943              | 2.57               | 227.43               | 44.16             | 0.20         |
| Reach 1 | 2409      | 2 YR    | 134.00           | 55.66             | 60.81             |                   | 60.86             | 0.000921              | 1.86               | 72.06                | 21.19             | 0.18         |
| Reach 1 | 2409      | 10 YR   | 277.00           | 55.66             | 62.83             |                   | 62.91             | 0.000990              | 2.31               | 119.90               | 26.30             | 0.19         |

# FORK SWAMP UT3: EXISTING CONDITIONS

HEC-RAS Plan: FSUT3 - Ex (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 2409      | 25 YR   | 383.00           | 55.66             | 63.78             |                   | 63.88             | 0.001112              | 2.62               | 146.08               | 28.71             | 0.20         |
| Reach 1 | 2409      | 50 YR   | 478.00           | 55.66             | 64.47             |                   | 64.60             | 0.001169              | 2.85               | 178.09               | 56.93             | 0.21         |
| Reach 1 | 2409      | 100 YR  | 584.00           | 55.66             | 65.12             |                   | 65.26             | 0.001216              | 3.07               | 218.68               | 68.51             | 0.22         |
| Reach 1 | 2917      | 2 YR    | 108.00           | 56.19             | 61.16             |                   | 61.18             | 0.000416              | 1.25               | 86.59                | 26.78             | 0.12         |
| Reach 1 | 2917      | 10 YR   | 213.00           | 56.19             | 63.19             |                   | 63.22             | 0.000373              | 1.44               | 147.67               | 33.33             | 0.12         |
| Reach 1 | 2917      | 25 YR   | 290.00           | 56.19             | 64.19             |                   | 64.23             | 0.000389              | 1.59               | 182.46               | 36.54             | 0.13         |
| Reach 1 | 2917      | 50 YR   | 358.00           | 56.19             | 64.91             |                   | 64.95             | 0.000393              | 1.71               | 212.45               | 47.11             | 0.13         |
| Reach 1 | 2917      | 100 YR  | 434.00           | 56.19             | 65.58             |                   | 65.63             | 0.000405              | 1.84               | 247.36               | 57.19             | 0.13         |
| Reach 1 | 3438      | 2 YR    | 108.00           | 55.93             | 61.25             |                   | 61.26             | 0.000065              | 0.57               | 189.91               | 49.84             | 0.05         |
| Reach 1 | 3438      | 10 YR   | 213.00           | 55.93             | 63.29             |                   | 63.30             | 0.000069              | 0.71               | 300.62               | 58.78             | 0.06         |
| Reach 1 | 3438      | 25 YR   | 290.00           | 55.93             | 64.29             |                   | 64.30             | 0.000074              | 0.80               | 369.52               | 84.37             | 0.06         |
| Reach 1 | 3438      | 50 YR   | 358.00           | 55.93             | 65.02             |                   | 65.03             | 0.000077              | 0.87               | 433.01               | 90.60             | 0.06         |
| Reach 1 | 3438      | 100 YR  | 434.00           | 55.93             | 65.70             |                   | 65.71             | 0.000082              | 0.95               | 496.61               | 96.78             | 0.06         |
| Reach 1 | 3919      | 2 YR    | 108.00           | 56.65             | 61.30             |                   | 61.34             | 0.000793              | 1.59               | 68.00                | 23.68             | 0.17         |
| Reach 1 | 3919      | 10 YR   | 213.00           | 56.65             | 63.34             |                   | 63.38             | 0.000612              | 1.72               | 123.81               | 31.18             | 0.15         |
| Reach 1 | 3919      | 25 YR   | 290.00           | 56.65             | 64.34             |                   | 64.40             | 0.000600              | 1.85               | 157.04               | 34.89             | 0.15         |
| Reach 1 | 3919      | 50 YR   | 358.00           | 56.65             | 65.07             |                   | 65.13             | 0.000581              | 1.96               | 183.56               | 38.53             | 0.15         |
| Reach 1 | 3919      | 100 YR  | 434.00           | 56.65             | 65.75             |                   | 65.81             | 0.000577              | 2.08               | 210.96               | 42.28             | 0.16         |
| Reach 1 | 4360      | 2 YR    | 108.00           | 56.95             | 61.70             |                   | 61.76             | 0.001132              | 1.90               | 56.77                | 18.78             | 0.19         |
| Reach 1 | 4360      | 10 YR   | 213.00           | 56.95             | 63.66             |                   | 63.73             | 0.000996              | 2.16               | 98.73                | 24.19             | 0.19         |
| Reach 1 | 4360      | 25 YR   | 290.00           | 56.95             | 64.66             |                   | 64.74             | 0.000998              | 2.33               | 124.26               | 26.95             | 0.19         |
| Reach 1 | 4360      | 50 YR   | 358.00           | 56.95             | 65.38             |                   | 65.47             | 0.001019              | 2.48               | 144.35               | 28.94             | 0.20         |
| Reach 1 | 4360      | 100 YR  | 434.00           | 56.95             | 66.05             |                   | 66.16             | 0.001034              | 2.64               | 169.21               | 56.32             | 0.20         |

**PRIMARY SYSTEM  
FUTURE CONDITIONS:  
HEC-RAS OUTPUT**

# FORK SWAMP MAIN BRANCH: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp Reach: Upper Reach

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 40427.0   | 2-YEAR   | 1106.00          | 39.01             | 46.79             | 43.61             | 47.17             | 0.003706              | 5.02               | 323.08               | 385.02            | 0.36         |
| Upper Reach | 40427.0   | 10-YEAR  | 2125.00          | 39.01             | 48.43             | 45.51             | 48.85             | 0.003705              | 5.91               | 1623.18              | 1003.11           | 0.38         |
| Upper Reach | 40427.0   | 25-YEAR  | 2857.00          | 39.01             | 49.18             | 47.86             | 49.59             | 0.003706              | 6.30               | 2505.49              | 1516.01           | 0.38         |
| Upper Reach | 40427.0   | 50-YEAR  | 3538.00          | 39.01             | 49.69             | 48.32             | 50.10             | 0.003701              | 6.55               | 3329.47              | 1662.48           | 0.39         |
| Upper Reach | 40427.0   | 100-YEAR | 4280.00          | 39.01             | 50.15             | 48.78             | 50.54             | 0.003703              | 6.78               | 4106.94              | 1738.14           | 0.39         |
| Upper Reach | 41233.0   | 2-YEAR   | 1106.00          | 39.95             | 48.52             | 46.03             | 48.57             | 0.000960              | 2.65               | 2247.83              | 1597.46           | 0.19         |
| Upper Reach | 41233.0   | 10-YEAR  | 2125.00          | 39.95             | 49.85             | 47.99             | 49.87             | 0.000595              | 2.38               | 4500.20              | 1896.10           | 0.15         |
| Upper Reach | 41233.0   | 25-YEAR  | 2857.00          | 39.95             | 50.53             | 48.24             | 50.55             | 0.000545              | 2.42               | 5689.00              | 1991.38           | 0.15         |
| Upper Reach | 41233.0   | 50-YEAR  | 3538.00          | 39.95             | 51.03             | 48.45             | 51.05             | 0.000542              | 2.51               | 6582.15              | 2031.53           | 0.15         |
| Upper Reach | 41233.0   | 100-YEAR | 4280.00          | 39.95             | 51.49             | 48.63             | 51.51             | 0.000556              | 2.63               | 7406.07              | 2068.12           | 0.15         |
| Upper Reach | 41704.5   | 2-YEAR   | 1106.00          | 40.50             | 49.03             |                   | 49.10             | 0.001299              | 3.07               | 1534.49              | 867.20            | 0.22         |
| Upper Reach | 41704.5   | 10-YEAR  | 2125.00          | 40.50             | 50.21             |                   | 50.27             | 0.001199              | 3.32               | 2913.45              | 1306.43           | 0.22         |
| Upper Reach | 41704.5   | 25-YEAR  | 2857.00          | 40.50             | 50.86             |                   | 50.91             | 0.001108              | 3.38               | 3788.63              | 1380.03           | 0.21         |
| Upper Reach | 41704.5   | 50-YEAR  | 3538.00          | 40.50             | 51.36             |                   | 51.41             | 0.001072              | 3.47               | 4488.16              | 1442.02           | 0.21         |
| Upper Reach | 41704.5   | 100-YEAR | 4280.00          | 40.50             | 51.82             |                   | 51.87             | 0.001076              | 3.60               | 5175.24              | 1505.00           | 0.21         |
| Upper Reach | 42742.0   | 2-YEAR   | 1094.00          | 40.98             | 50.15             |                   | 50.20             | 0.000876              | 2.70               | 1826.45              | 1020.78           | 0.18         |
| Upper Reach | 42742.0   | 10-YEAR  | 2102.00          | 40.98             | 51.32             |                   | 51.37             | 0.000941              | 3.11               | 3069.60              | 1096.44           | 0.20         |
| Upper Reach | 42742.0   | 25-YEAR  | 2826.00          | 40.98             | 51.94             |                   | 51.99             | 0.000985              | 3.35               | 3763.66              | 1124.97           | 0.20         |
| Upper Reach | 42742.0   | 50-YEAR  | 3502.00          | 40.98             | 52.44             |                   | 52.50             | 0.001025              | 3.55               | 4333.05              | 1147.85           | 0.21         |
| Upper Reach | 42742.0   | 100-YEAR | 4237.00          | 40.98             | 52.92             |                   | 52.98             | 0.001062              | 3.74               | 4893.84              | 1170.02           | 0.21         |
| Upper Reach | 43230.0   | 2-YEAR   | 1094.00          | 41.20             | 50.49             |                   | 50.51             | 0.000470              | 2.00               | 2862.01              | 1494.65           | 0.13         |
| Upper Reach | 43230.0   | 10-YEAR  | 2102.00          | 41.20             | 51.66             |                   | 51.68             | 0.000468              | 2.22               | 4689.66              | 1600.89           | 0.14         |
| Upper Reach | 43230.0   | 25-YEAR  | 2826.00          | 41.20             | 52.30             |                   | 52.32             | 0.000476              | 2.35               | 5713.70              | 1622.79           | 0.14         |
| Upper Reach | 43230.0   | 50-YEAR  | 3502.00          | 41.20             | 52.81             |                   | 52.83             | 0.000487              | 2.47               | 6550.16              | 1640.47           | 0.14         |
| Upper Reach | 43230.0   | 100-YEAR | 4237.00          | 41.20             | 53.31             |                   | 53.33             | 0.000501              | 2.60               | 7367.87              | 1657.57           | 0.15         |
| Upper Reach | 43829.0   | 2-YEAR   | 850.00           | 41.48             | 50.65             |                   | 50.65             | 0.000119              | 1.00               | 3443.63              | 1299.75           | 0.07         |
| Upper Reach | 43829.0   | 10-YEAR  | 1595.00          | 41.48             | 51.83             |                   | 51.84             | 0.000139              | 1.20               | 5016.10              | 1344.76           | 0.08         |
| Upper Reach | 43829.0   | 25-YEAR  | 2121.00          | 41.48             | 52.48             |                   | 52.48             | 0.000153              | 1.32               | 5890.96              | 1373.47           | 0.08         |
| Upper Reach | 43829.0   | 50-YEAR  | 2614.00          | 41.48             | 53.00             |                   | 53.00             | 0.000165              | 1.43               | 6614.48              | 1401.03           | 0.08         |
| Upper Reach | 43829.0   | 100-YEAR | 3187.00          | 41.48             | 53.51             |                   | 53.51             | 0.000181              | 1.55               | 7331.19              | 1427.81           | 0.09         |
| Upper Reach | 44420.0   | 2-YEAR   | 850.00           | 42.46             | 50.72             |                   | 50.73             | 0.000145              | 1.10               | 3345.11              | 1308.65           | 0.07         |
| Upper Reach | 44420.0   | 10-YEAR  | 1595.00          | 42.46             | 51.92             |                   | 51.93             | 0.000163              | 1.28               | 4979.90              | 1419.97           | 0.08         |
| Upper Reach | 44420.0   | 25-YEAR  | 2121.00          | 42.46             | 52.57             |                   | 52.58             | 0.000172              | 1.39               | 5919.60              | 1463.90           | 0.08         |

# FORK SWAMP MAIN BRANCH: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 44420.0   | 50-YEAR  | 2614.00          | 42.46             | 53.10             |                   | 53.11             | 0.000181              | 1.48               | 6702.04              | 1499.50           | 0.08         |
| Upper Reach | 44420.0   | 100-YEAR | 3187.00          | 42.46             | 53.62             |                   | 53.62             | 0.000193              | 1.58               | 7484.15              | 1534.25           | 0.09         |
| Upper Reach | 45322.0   | 2-YEAR   | 599.00           | 43.50             | 50.89             |                   | 50.90             | 0.000297              | 1.44               | 2191.63              | 1583.67           | 0.10         |
| Upper Reach | 45322.0   | 10-YEAR  | 1124.00          | 43.50             | 52.07             |                   | 52.08             | 0.000179              | 1.25               | 4138.09              | 1683.72           | 0.08         |
| Upper Reach | 45322.0   | 25-YEAR  | 1505.00          | 43.50             | 52.72             |                   | 52.73             | 0.000158              | 1.24               | 5242.64              | 1716.07           | 0.08         |
| Upper Reach | 45322.0   | 50-YEAR  | 1843.00          | 43.50             | 53.25             |                   | 53.26             | 0.000145              | 1.24               | 6156.63              | 1742.53           | 0.07         |
| Upper Reach | 45322.0   | 100-YEAR | 2211.00          | 43.50             | 53.77             |                   | 53.77             | 0.000137              | 1.25               | 7064.64              | 1762.04           | 0.07         |
| Upper Reach | 46097.8   | 2-YEAR   | 599.00           | 44.33             | 51.16             |                   | 51.17             | 0.000406              | 1.59               | 1745.74              | 1193.44           | 0.12         |
| Upper Reach | 46097.8   | 10-YEAR  | 1124.00          | 44.33             | 52.25             |                   | 52.26             | 0.000301              | 1.53               | 3161.07              | 1368.62           | 0.10         |
| Upper Reach | 46097.8   | 25-YEAR  | 1505.00          | 44.33             | 52.88             |                   | 52.89             | 0.000268              | 1.53               | 4039.69              | 1420.23           | 0.10         |
| Upper Reach | 46097.8   | 50-YEAR  | 1843.00          | 44.33             | 53.39             |                   | 53.40             | 0.000247              | 1.53               | 4782.55              | 1462.45           | 0.10         |
| Upper Reach | 46097.8   | 100-YEAR | 2211.00          | 44.33             | 53.90             |                   | 53.91             | 0.000235              | 1.56               | 5542.37              | 1514.08           | 0.09         |
| Upper Reach | 46863.0   | 2-YEAR   | 599.00           | 44.76             | 51.43             |                   | 51.44             | 0.000301              | 1.34               | 2251.60              | 1583.82           | 0.10         |
| Upper Reach | 46863.0   | 10-YEAR  | 1124.00          | 44.76             | 52.45             |                   | 52.45             | 0.000217              | 1.27               | 3905.68              | 1655.56           | 0.09         |
| Upper Reach | 46863.0   | 25-YEAR  | 1505.00          | 44.76             | 53.05             |                   | 53.06             | 0.000192              | 1.27               | 4921.53              | 1685.07           | 0.08         |
| Upper Reach | 46863.0   | 50-YEAR  | 1843.00          | 44.76             | 53.56             |                   | 53.56             | 0.000177              | 1.27               | 5774.51              | 1727.53           | 0.08         |
| Upper Reach | 46863.0   | 100-YEAR | 2211.00          | 44.76             | 54.06             |                   | 54.06             | 0.000165              | 1.28               | 6649.36              | 1764.93           | 0.08         |
| Upper Reach | 47656.0   | 2-YEAR   | 473.00           | 45.21             | 51.79             |                   | 51.85             | 0.001258              | 2.71               | 686.09               | 765.68            | 0.20         |
| Upper Reach | 47656.0   | 10-YEAR  | 901.00           | 45.21             | 52.72             |                   | 52.76             | 0.000990              | 2.66               | 1524.59              | 963.89            | 0.18         |
| Upper Reach | 47656.0   | 25-YEAR  | 1208.00          | 45.21             | 53.29             |                   | 53.32             | 0.000802              | 2.54               | 2092.12              | 1007.08           | 0.17         |
| Upper Reach | 47656.0   | 50-YEAR  | 1478.00          | 45.21             | 53.77             |                   | 53.80             | 0.000685              | 2.45               | 2584.58              | 1053.70           | 0.16         |
| Upper Reach | 47656.0   | 100-YEAR | 1777.00          | 45.21             | 54.26             |                   | 54.28             | 0.000604              | 2.39               | 3108.13              | 1095.83           | 0.15         |
| Upper Reach | 48173.0   | 2-YEAR   | 473.00           | 45.55             | 52.44             |                   | 52.51             | 0.001277              | 2.41               | 488.14               | 643.53            | 0.21         |
| Upper Reach | 48173.0   | 10-YEAR  | 901.00           | 45.55             | 53.27             |                   | 53.34             | 0.001243              | 2.70               | 1043.98              | 688.08            | 0.22         |
| Upper Reach | 48173.0   | 25-YEAR  | 1208.00          | 45.55             | 53.77             |                   | 53.83             | 0.001167              | 2.79               | 1392.12              | 716.15            | 0.21         |
| Upper Reach | 48173.0   | 50-YEAR  | 1478.00          | 45.55             | 54.19             |                   | 54.24             | 0.001072              | 2.81               | 1697.11              | 734.50            | 0.21         |
| Upper Reach | 48173.0   | 100-YEAR | 1777.00          | 45.55             | 54.63             |                   | 54.68             | 0.000982              | 2.82               | 2025.43              | 753.77            | 0.20         |
| Upper Reach | 48793.0   | 2-YEAR   | 473.00           | 45.95             | 53.18             |                   | 53.26             | 0.001147              | 2.41               | 377.74               | 288.35            | 0.20         |
| Upper Reach | 48793.0   | 10-YEAR  | 901.00           | 45.95             | 54.09             |                   | 54.20             | 0.001517              | 3.15               | 725.19               | 442.67            | 0.24         |
| Upper Reach | 48793.0   | 25-YEAR  | 1208.00          | 45.95             | 54.57             |                   | 54.69             | 0.001622              | 3.45               | 944.48               | 469.05            | 0.25         |
| Upper Reach | 48793.0   | 50-YEAR  | 1478.00          | 45.95             | 54.96             |                   | 55.08             | 0.001659              | 3.64               | 1128.97              | 492.39            | 0.26         |
| Upper Reach | 48793.0   | 100-YEAR | 1777.00          | 45.95             | 55.35             |                   | 55.48             | 0.001666              | 3.80               | 1331.45              | 529.37            | 0.26         |

# FORK SWAMP MAIN BRANCH: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 49296     | 2-YEAR   | 464.00           | 47.66             | 54.11             |                   | 54.31             | 0.004487              | 4.19               | 303.64               | 324.63            | 0.35         |
| Upper Reach | 49296     | 10-YEAR  | 877.00           | 47.66             | 55.16             |                   | 55.28             | 0.003241              | 4.05               | 699.66               | 423.81            | 0.31         |
| Upper Reach | 49296     | 25-YEAR  | 1174.00          | 47.66             | 55.67             |                   | 55.78             | 0.003040              | 4.17               | 927.64               | 467.30            | 0.30         |
| Upper Reach | 49296     | 50-YEAR  | 1432.00          | 47.66             | 56.06             |                   | 56.16             | 0.002918              | 4.26               | 1116.32              | 501.25            | 0.30         |
| Upper Reach | 49296     | 100-YEAR | 1718.00          | 47.66             | 56.45             |                   | 56.54             | 0.002775              | 4.32               | 1315.06              | 523.24            | 0.29         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 49788.0   | 2-YEAR   | 464.00           | 47.04             | 54.93             |                   | 54.98             | 0.000638              | 1.98               | 529.73               | 485.37            | 0.15         |
| Upper Reach | 49788.0   | 10-YEAR  | 877.00           | 47.04             | 55.90             |                   | 55.96             | 0.000754              | 2.41               | 1026.95              | 543.80            | 0.17         |
| Upper Reach | 49788.0   | 25-YEAR  | 1174.00          | 47.04             | 56.41             |                   | 56.47             | 0.000795              | 2.62               | 1311.27              | 574.45            | 0.18         |
| Upper Reach | 49788.0   | 50-YEAR  | 1432.00          | 47.04             | 56.79             |                   | 56.86             | 0.000819              | 2.76               | 1536.85              | 594.00            | 0.19         |
| Upper Reach | 49788.0   | 100-YEAR | 1718.00          | 47.04             | 57.17             |                   | 57.24             | 0.000843              | 2.90               | 1764.36              | 603.20            | 0.19         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50078     | 2-YEAR   | 464.00           | 47.75             | 55.18             |                   | 55.38             | 0.003176              | 3.57               | 130.23               | 42.74             | 0.31         |
| Upper Reach | 50078     | 10-YEAR  | 877.00           | 47.75             | 56.18             | 53.57             | 56.45             | 0.004161              | 4.59               | 437.01               | 620.09            | 0.36         |
| Upper Reach | 50078     | 25-YEAR  | 1174.00          | 47.75             | 56.73             |                   | 56.91             | 0.003080              | 4.23               | 786.70               | 648.20            | 0.32         |
| Upper Reach | 50078     | 50-YEAR  | 1432.00          | 47.75             | 57.12             |                   | 57.27             | 0.002559              | 4.04               | 1048.85              | 672.68            | 0.29         |
| Upper Reach | 50078     | 100-YEAR | 1718.00          | 47.75             | 57.51             |                   | 57.63             | 0.002214              | 3.92               | 1312.51              | 696.67            | 0.27         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50144.8   | 2-YEAR   | 464.00           | 47.85             | 55.43             | 51.84             | 55.53             | 0.001074              | 2.46               | 201.48               | 143.10            | 0.20         |
| Upper Reach | 50144.8   | 10-YEAR  | 877.00           | 47.85             | 56.44             | 53.07             | 56.66             | 0.001953              | 3.77               | 251.91               | 244.16            | 0.28         |
| Upper Reach | 50144.8   | 25-YEAR  | 1174.00          | 47.85             | 56.88             | 53.73             | 57.07             | 0.001854              | 3.86               | 595.00               | 394.47            | 0.27         |
| Upper Reach | 50144.8   | 50-YEAR  | 1432.00          | 47.85             | 57.24             | 54.25             | 57.45             | 0.002021              | 4.19               | 759.07               | 517.95            | 0.29         |
| Upper Reach | 50144.8   | 100-YEAR | 1718.00          | 47.85             | 57.61             | 54.71             | 57.81             | 0.002033              | 4.35               | 969.39               | 630.80            | 0.29         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50167.8   |          | Bridge           |                   |                   |                   |                   |                       |                    |                      |                   |              |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50190.8   | 2-YEAR   | 464.00           | 47.99             | 55.59             | 51.99             | 55.68             | 0.001063              | 2.45               | 202.19               | 143.78            | 0.20         |
| Upper Reach | 50190.8   | 10-YEAR  | 877.00           | 47.99             | 57.04             | 53.21             | 57.22             | 0.001496              | 3.47               | 274.69               | 399.05            | 0.25         |
| Upper Reach | 50190.8   | 25-YEAR  | 1174.00          | 47.99             | 57.48             | 53.88             | 57.75             | 0.002112              | 4.32               | 296.60               | 550.70            | 0.30         |
| Upper Reach | 50190.8   | 50-YEAR  | 1432.00          | 47.99             | 58.39             | 54.39             | 58.46             | 0.000713              | 2.73               | 1409.67              | 720.52            | 0.18         |
| Upper Reach | 50190.8   | 100-YEAR | 1718.00          | 47.99             | 58.72             | 54.85             | 58.79             | 0.000730              | 2.84               | 1647.21              | 759.23            | 0.18         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50286.0   | 2-YEAR   | 420.00           | 48.25             | 55.73             |                   | 55.77             | 0.000615              | 1.83               | 467.41               | 410.54            | 0.15         |
| Upper Reach | 50286.0   | 10-YEAR  | 787.00           | 48.25             | 57.30             |                   | 57.33             | 0.000328              | 1.63               | 1196.77              | 546.41            | 0.11         |
| Upper Reach | 50286.0   | 25-YEAR  | 1051.00          | 48.25             | 57.88             |                   | 57.90             | 0.000340              | 1.76               | 1532.44              | 628.22            | 0.12         |
| Upper Reach | 50286.0   | 50-YEAR  | 1279.00          | 48.25             | 58.50             |                   | 58.52             | 0.000289              | 1.72               | 1951.49              | 717.35            | 0.11         |
| Upper Reach | 50286.0   | 100-YEAR | 1534.00          | 48.25             | 58.82             |                   | 58.84             | 0.000312              | 1.84               | 2188.74              | 763.17            | 0.12         |
|             |           |          |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50622     | 2-YEAR   | 420.00           | 48.89             | 55.99             |                   | 56.04             | 0.001056              | 2.45               | 499.24               | 362.17            | 0.18         |



# FORK SWAMP MAIN BRANCH: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 50622     | 10-YEAR  | 787.00           | 48.89             | 57.45             |                   | 57.47             | 0.000616              | 2.19               | 1136.01              | 508.11            | 0.15         |
| Upper Reach | 50622     | 25-YEAR  | 1051.00          | 48.89             | 58.02             |                   | 58.05             | 0.000611              | 2.30               | 1444.70              | 564.06            | 0.15         |
| Upper Reach | 50622     | 50-YEAR  | 1279.00          | 48.89             | 58.62             |                   | 58.65             | 0.000516              | 2.22               | 1796.80              | 608.27            | 0.14         |
| Upper Reach | 50622     | 100-YEAR | 1534.00          | 48.89             | 58.95             |                   | 58.98             | 0.000559              | 2.37               | 2002.03              | 632.81            | 0.14         |
| Upper Reach | 51042     | 2-YEAR   | 420.00           | 49.51             | 56.46             |                   | 56.52             | 0.001239              | 2.35               | 473.92               | 505.78            | 0.20         |
| Upper Reach | 51042     | 10-YEAR  | 787.00           | 49.51             | 57.71             |                   | 57.74             | 0.000633              | 1.98               | 1245.19              | 706.37            | 0.15         |
| Upper Reach | 51042     | 25-YEAR  | 1051.00          | 49.51             | 58.27             |                   | 58.29             | 0.000544              | 1.95               | 1650.50              | 740.22            | 0.14         |
| Upper Reach | 51042     | 50-YEAR  | 1279.00          | 49.51             | 58.83             |                   | 58.84             | 0.000431              | 1.84               | 2070.26              | 769.32            | 0.13         |
| Upper Reach | 51042     | 100-YEAR | 1534.00          | 49.51             | 59.17             |                   | 59.19             | 0.000441              | 1.93               | 2336.77              | 787.40            | 0.13         |
| Upper Reach | 51532.0   | 2-YEAR   | 420.00           | 50.48             | 57.10             |                   | 57.17             | 0.001407              | 2.42               | 354.34               | 336.34            | 0.22         |
| Upper Reach | 51532.0   | 10-YEAR  | 787.00           | 50.48             | 58.11             |                   | 58.19             | 0.001325              | 2.75               | 737.98               | 438.47            | 0.22         |
| Upper Reach | 51532.0   | 25-YEAR  | 1051.00          | 50.48             | 58.63             |                   | 58.71             | 0.001322              | 2.94               | 1006.48              | 688.43            | 0.22         |
| Upper Reach | 51532.0   | 50-YEAR  | 1279.00          | 50.48             | 59.12             |                   | 59.18             | 0.001143              | 2.90               | 1403.62              | 902.97            | 0.21         |
| Upper Reach | 51532.0   | 100-YEAR | 1534.00          | 50.48             | 59.46             |                   | 59.53             | 0.001099              | 2.95               | 1724.53              | 945.31            | 0.21         |
| Upper Reach | 52049.0   | 2-YEAR   | 397.00           | 50.64             | 57.73             |                   | 57.81             | 0.001068              | 2.28               | 274.94               | 310.80            | 0.19         |
| Upper Reach | 52049.0   | 10-YEAR  | 744.00           | 50.64             | 58.74             |                   | 58.82             | 0.001137              | 2.71               | 771.86               | 662.99            | 0.21         |
| Upper Reach | 52049.0   | 25-YEAR  | 992.00           | 50.64             | 59.24             |                   | 59.32             | 0.001076              | 2.80               | 1130.54              | 771.32            | 0.21         |
| Upper Reach | 52049.0   | 50-YEAR  | 1206.00          | 50.64             | 59.66             |                   | 59.73             | 0.000958              | 2.77               | 1462.27              | 823.78            | 0.20         |
| Upper Reach | 52049.0   | 100-YEAR | 1444.00          | 50.64             | 59.99             |                   | 60.05             | 0.000948              | 2.85               | 1740.13              | 864.13            | 0.20         |
| Upper Reach | 52380     | 2-YEAR   | 397.00           | 50.74             | 58.04             |                   | 58.13             | 0.000867              | 2.42               | 242.55               | 332.65            | 0.20         |
| Upper Reach | 52380     | 10-YEAR  | 744.00           | 50.74             | 59.06             |                   | 59.14             | 0.000823              | 2.69               | 755.54               | 582.74            | 0.20         |
| Upper Reach | 52380     | 25-YEAR  | 992.00           | 50.74             | 59.56             |                   | 59.63             | 0.000786              | 2.78               | 1066.21              | 664.82            | 0.20         |
| Upper Reach | 52380     | 50-YEAR  | 1206.00          | 50.74             | 59.94             |                   | 60.00             | 0.000724              | 2.78               | 1327.66              | 702.56            | 0.19         |
| Upper Reach | 52380     | 100-YEAR | 1444.00          | 50.74             | 60.27             |                   | 60.33             | 0.000729              | 2.89               | 1566.31              | 748.53            | 0.19         |
| Upper Reach | 52610     | 2-YEAR   | 397.00           | 51.93             | 58.28             |                   | 58.40             | 0.001654              | 2.90               | 235.21               | 287.72            | 0.26         |
| Upper Reach | 52610     | 10-YEAR  | 744.00           | 51.93             | 59.28             |                   | 59.39             | 0.001464              | 3.16               | 558.58               | 393.38            | 0.26         |
| Upper Reach | 52610     | 25-YEAR  | 992.00           | 51.93             | 59.76             |                   | 59.86             | 0.001411              | 3.31               | 776.55               | 510.26            | 0.26         |
| Upper Reach | 52610     | 50-YEAR  | 1206.00          | 51.93             | 60.13             |                   | 60.22             | 0.001331              | 3.37               | 968.05               | 534.69            | 0.25         |
| Upper Reach | 52610     | 100-YEAR | 1444.00          | 51.93             | 60.45             |                   | 60.55             | 0.001311              | 3.47               | 1148.70              | 572.79            | 0.25         |
| Upper Reach | 53110     | 2-YEAR   | 397.00           | 52.54             | 59.12             |                   | 59.26             | 0.001767              | 3.09               | 148.59               | 139.20            | 0.27         |
| Upper Reach | 53110     | 10-YEAR  | 744.00           | 52.54             | 60.09             |                   | 60.28             | 0.002100              | 3.83               | 419.61               | 388.01            | 0.30         |
| Upper Reach | 53110     | 25-YEAR  | 992.00           | 52.54             | 60.54             |                   | 60.72             | 0.002055              | 4.01               | 602.93               | 424.12            | 0.31         |
| Upper Reach | 53110     | 50-YEAR  | 1206.00          | 52.54             | 60.87             |                   | 61.05             | 0.002013              | 4.13               | 747.48               | 449.75            | 0.31         |

# FORK SWAMP MAIN BRANCH: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 53110     | 100-YEAR | 1444.00          | 52.54             | 61.19             |                   | 61.36             | 0.002000              | 4.27               | 895.33               | 478.86            | 0.31         |
| Upper Reach | 53471     | 2-YEAR   | 258.00           | 53.33             | 59.73             | 56.30             | 59.80             | 0.001140              | 2.10               | 122.61               | 39.58             | 0.21         |
| Upper Reach | 53471     | 10-YEAR  | 488.00           | 53.33             | 60.83             | 57.58             | 60.95             | 0.001510              | 2.85               | 193.98               | 128.08            | 0.25         |
| Upper Reach | 53471     | 25-YEAR  | 644.00           | 53.33             | 61.27             | 58.04             | 61.43             | 0.001695              | 3.24               | 274.01               | 236.72            | 0.27         |
| Upper Reach | 53471     | 50-YEAR  | 785.00           | 53.33             | 61.59             | 58.41             | 61.77             | 0.001818              | 3.52               | 342.42               | 265.88            | 0.29         |
| Upper Reach | 53471     | 100-YEAR | 939.00           | 53.33             | 61.91             | 58.81             | 62.10             | 0.001904              | 3.76               | 418.84               | 305.45            | 0.30         |
| Upper Reach | 53971     | 2-YEAR   | 258.00           | 54.04             | 60.32             | 57.67             | 60.41             | 0.001260              | 2.33               | 112.22               | 43.75             | 0.23         |
| Upper Reach | 53971     | 10-YEAR  | 488.00           | 54.04             | 61.58             | 58.57             | 61.71             | 0.001512              | 3.00               | 201.70               | 102.26            | 0.26         |
| Upper Reach | 53971     | 25-YEAR  | 644.00           | 54.04             | 62.10             | 59.06             | 62.26             | 0.001658              | 3.38               | 265.09               | 138.33            | 0.27         |
| Upper Reach | 53971     | 50-YEAR  | 785.00           | 54.04             | 62.47             | 59.46             | 62.66             | 0.001776              | 3.68               | 320.82               | 157.57            | 0.29         |
| Upper Reach | 53971     | 100-YEAR | 939.00           | 54.04             | 62.83             | 59.86             | 63.04             | 0.001866              | 3.95               | 379.94               | 170.65            | 0.30         |
| Upper Reach | 54356     | 2-YEAR   | 258.00           | 54.67             | 60.81             | 58.32             | 60.91             | 0.001340              | 2.65               | 112.93               | 45.48             | 0.24         |
| Upper Reach | 54356     | 10-YEAR  | 488.00           | 54.67             | 62.15             | 59.23             | 62.32             | 0.001623              | 3.54               | 187.05               | 73.24             | 0.27         |
| Upper Reach | 54356     | 25-YEAR  | 644.00           | 54.67             | 62.72             | 59.75             | 62.95             | 0.001851              | 4.06               | 239.26               | 97.72             | 0.30         |
| Upper Reach | 54356     | 50-YEAR  | 785.00           | 54.67             | 63.14             | 60.19             | 63.41             | 0.002032              | 4.45               | 282.44               | 108.93            | 0.31         |
| Upper Reach | 54356     | 100-YEAR | 939.00           | 54.67             | 63.54             | 60.63             | 63.84             | 0.002200              | 4.82               | 327.35               | 117.67            | 0.33         |
| Upper Reach | 54540     | 2-YEAR   | 258.00           | 54.97             | 61.02             | 56.81             | 61.06             | 0.000440              | 1.64               | 157.61               | 35.24             | 0.14         |
| Upper Reach | 54540     | 10-YEAR  | 488.00           | 54.97             | 62.45             | 57.69             | 62.54             | 0.000670              | 2.32               | 211.28               | 43.00             | 0.17         |
| Upper Reach | 54540     | 25-YEAR  | 644.00           | 54.97             | 63.08             | 58.19             | 63.20             | 0.000814              | 2.74               | 237.16               | 61.26             | 0.19         |
| Upper Reach | 54540     | 50-YEAR  | 785.00           | 54.97             | 63.54             | 58.60             | 63.69             | 0.000937              | 3.09               | 275.34               | 75.52             | 0.21         |
| Upper Reach | 54540     | 100-YEAR | 939.00           | 54.97             | 63.97             | 59.00             | 64.15             | 0.001069              | 3.43               | 310.64               | 88.93             | 0.23         |
| Upper Reach | 54609     |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 54678     | 2-YEAR   | 258.00           | 54.50             | 61.46             | 56.63             | 61.50             | 0.000332              | 1.47               | 175.91               | 37.68             | 0.12         |
| Upper Reach | 54678     | 10-YEAR  | 488.00           | 54.50             | 64.00             | 57.58             | 64.05             | 0.000313              | 1.73               | 286.99               | 100.62            | 0.12         |
| Upper Reach | 54678     | 25-YEAR  | 644.00           | 54.50             | 65.81             | 58.11             | 65.86             | 0.000240              | 1.75               | 382.24               | 190.66            | 0.11         |
| Upper Reach | 54678     | 50-YEAR  | 785.00           | 54.50             | 66.88             | 58.53             | 66.91             | 0.000168              | 1.59               | 822.27               | 283.53            | 0.09         |
| Upper Reach | 54678     | 100-YEAR | 939.00           | 54.50             | 67.19             | 58.95             | 67.23             | 0.000205              | 1.80               | 918.90               | 324.14            | 0.10         |
| Upper Reach | 54971     | 2-YEAR   | 251.00           | 54.98             | 61.60             |                   | 61.69             | 0.001193              | 2.33               | 107.94               | 30.34             | 0.22         |
| Upper Reach | 54971     | 10-YEAR  | 475.00           | 54.98             | 64.12             |                   | 64.21             | 0.000809              | 2.42               | 212.53               | 95.76             | 0.19         |
| Upper Reach | 54971     | 25-YEAR  | 629.00           | 54.98             | 65.89             |                   | 65.96             | 0.000423              | 2.13               | 444.00               | 167.28            | 0.14         |
| Upper Reach | 54971     | 50-YEAR  | 765.00           | 54.98             | 66.94             |                   | 66.99             | 0.000326              | 2.06               | 674.18               | 303.13            | 0.13         |
| Upper Reach | 54971     | 100-YEAR | 916.00           | 54.98             | 67.26             |                   | 67.33             | 0.000382              | 2.29               | 778.52               | 340.01            | 0.14         |

# FORK SWAMP MAIN BRANCH: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 55437     | 2-YEAR   | 251.00           | 54.98             | 62.09             |                   | 62.15             | 0.000830              | 2.04               | 123.05               | 31.97             | 0.18         |
| Upper Reach | 55437     | 10-YEAR  | 475.00           | 54.98             | 64.47             |                   | 64.54             | 0.000630              | 2.23               | 247.94               | 105.68            | 0.17         |
| Upper Reach | 55437     | 25-YEAR  | 629.00           | 54.98             | 66.09             |                   | 66.15             | 0.000372              | 2.04               | 476.94               | 172.99            | 0.13         |
| Upper Reach | 55437     | 50-YEAR  | 765.00           | 54.98             | 67.09             |                   | 67.14             | 0.000294              | 1.98               | 720.85               | 311.40            | 0.12         |
| Upper Reach | 55437     | 100-YEAR | 916.00           | 54.98             | 67.44             |                   | 67.50             | 0.000338              | 2.18               | 840.07               | 352.02            | 0.13         |
| Upper Reach | 55537     | 2-YEAR   | 251.00           | 55.92             | 62.17             | 58.18             | 62.22             | 0.000530              | 1.77               | 141.56               | 34.14             | 0.15         |
| Upper Reach | 55537     | 10-YEAR  | 475.00           | 55.92             | 64.55             | 59.15             | 64.60             | 0.000374              | 1.91               | 312.35               | 195.31            | 0.14         |
| Upper Reach | 55537     | 25-YEAR  | 629.00           | 55.92             | 66.14             | 59.68             | 66.18             | 0.000246              | 1.81               | 494.29               | 293.50            | 0.12         |
| Upper Reach | 55537     | 50-YEAR  | 765.00           | 55.92             | 67.12             | 60.10             | 67.16             | 0.000216              | 1.84               | 612.33               | 435.13            | 0.11         |
| Upper Reach | 55537     | 100-YEAR | 916.00           | 55.92             | 67.51             | 60.53             | 67.53             | 0.000141              | 1.53               | 1302.57              | 515.55            | 0.09         |
| Upper Reach | 55592     |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 55651     | 2-YEAR   | 251.00           | 57.89             | 63.06             | 59.67             | 63.12             | 0.000646              | 1.91               | 131.46               | 32.42             | 0.17         |
| Upper Reach | 55651     | 10-YEAR  | 475.00           | 57.89             | 66.01             | 60.50             | 66.06             | 0.000336              | 1.82               | 341.61               | 414.24            | 0.13         |
| Upper Reach | 55651     | 25-YEAR  | 629.00           | 57.89             | 68.76             | 60.97             | 68.78             | 0.000112              | 1.34               | 672.07               | 770.73            | 0.08         |
| Upper Reach | 55651     | 50-YEAR  | 765.00           | 57.89             | 70.97             | 61.36             | 70.97             | 0.000017              | 0.61               | 3873.01              | 2137.32           | 0.03         |
| Upper Reach | 55651     | 100-YEAR | 916.00           | 57.89             | 71.35             | 61.75             | 71.35             | 0.000016              | 0.60               | 5286.61              | 2687.90           | 0.03         |
| Upper Reach | 55788     | 2-YEAR   | 188.00           | 57.96             | 63.16             | 60.26             | 63.22             | 0.000967              | 2.03               | 92.70                | 29.08             | 0.20         |
| Upper Reach | 55788     | 10-YEAR  | 352.00           | 57.96             | 66.06             | 61.15             | 66.11             | 0.000370              | 1.71               | 306.56               | 293.10            | 0.13         |
| Upper Reach | 55788     | 25-YEAR  | 468.00           | 57.96             | 68.80             | 61.65             | 68.80             | 0.000035              | 0.70               | 1933.72              | 1050.95           | 0.04         |
| Upper Reach | 55788     | 50-YEAR  | 569.00           | 57.96             | 70.97             | 62.03             | 70.97             | 0.000010              | 0.44               | 4011.10              | 2658.02           | 0.02         |
| Upper Reach | 55788     | 100-YEAR | 681.00           | 57.96             | 71.36             | 62.40             | 71.36             | 0.000011              | 0.47               | 4430.88              | 2993.03           | 0.03         |
| Upper Reach | 55853     | 2-YEAR   | 188.00           | 58.92             | 63.23             | 60.37             | 63.28             | 0.000690              | 1.83               | 103.12               | 28.96             | 0.17         |
| Upper Reach | 55853     | 10-YEAR  | 352.00           | 58.92             | 66.08             | 61.05             | 66.13             | 0.000339              | 1.79               | 302.34               | 276.65            | 0.13         |
| Upper Reach | 55853     | 25-YEAR  | 468.00           | 58.92             | 68.80             | 61.46             | 68.80             | 0.000058              | 0.94               | 1399.01              | 647.79            | 0.06         |
| Upper Reach | 55853     | 50-YEAR  | 569.00           | 58.92             | 70.97             | 61.79             | 70.98             | 0.000017              | 0.59               | 3123.91              | 2753.46           | 0.03         |
| Upper Reach | 55853     | 100-YEAR | 681.00           | 58.92             | 71.36             | 62.12             | 71.36             | 0.000019              | 0.63               | 3494.04              | 2990.51           | 0.03         |
| Upper Reach | 55891     |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 55958     | 2-YEAR   | 188.00           | 58.73             | 63.89             | 60.53             | 63.93             | 0.000514              | 1.70               | 112.31               | 30.25             | 0.15         |
| Upper Reach | 55958     | 10-YEAR  | 352.00           | 58.73             | 66.28             | 61.29             | 66.32             | 0.000350              | 1.84               | 295.92               | 250.00            | 0.13         |
| Upper Reach | 55958     | 25-YEAR  | 468.00           | 58.73             | 68.80             | 61.73             | 68.81             | 0.000072              | 1.05               | 1346.05              | 727.42            | 0.06         |
| Upper Reach | 55958     | 50-YEAR  | 569.00           | 58.73             | 70.98             | 62.08             | 70.98             | 0.000017              | 0.59               | 3145.83              | 2081.16           | 0.03         |

# FORK SWAMP MAIN BRANCH: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 55958     | 100-YEAR | 681.00           | 58.73             | 71.36             | 62.43             | 71.36             | 0.000018              | 0.63               | 3510.85              | 2551.59           | 0.03         |
| Upper Reach | 56230     | 2-YEAR   | 188.00           | 59.25             | 64.10             | 61.83             | 64.22             | 0.002124              | 2.83               | 66.51                | 22.11             | 0.29         |
| Upper Reach | 56230     | 10-YEAR  | 352.00           | 59.25             | 66.41             | 62.81             | 66.52             | 0.001248              | 2.74               | 149.07               | 118.21            | 0.23         |
| Upper Reach | 56230     | 25-YEAR  | 468.00           | 59.25             | 68.82             | 63.35             | 68.84             | 0.000193              | 1.43               | 897.61               | 617.73            | 0.10         |
| Upper Reach | 56230     | 50-YEAR  | 569.00           | 59.25             | 70.99             | 63.78             | 70.99             | 0.000035              | 0.73               | 2463.68              | 2453.86           | 0.04         |
| Upper Reach | 56230     | 100-YEAR | 681.00           | 59.25             | 71.37             | 64.19             | 71.37             | 0.000036              | 0.76               | 2798.90              | 2806.38           | 0.04         |

# FORK SWAMP UT1: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp UT1 Reach: Reach 1

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 1030      | 2-Year   | 252.00           | 45.23             | 50.65             | 47.77             | 50.66             | 0.000128              | 0.95               | 852.72               | 577.17            | 0.09         |
| Reach 1 | 1030      | 10-Year  | 522.00           | 45.23             | 51.83             | 49.21             | 51.83             | 0.000098              | 1.00               | 1561.58              | 624.29            | 0.08         |
| Reach 1 | 1030      | 25-Year  | 728.00           | 45.23             | 52.48             | 49.78             | 52.48             | 0.000095              | 1.07               | 1975.80              | 650.23            | 0.08         |
| Reach 1 | 1030      | 50-Year  | 920.00           | 45.23             | 53.00             | 49.94             | 53.01             | 0.000094              | 1.13               | 2319.37              | 671.28            | 0.08         |
| Reach 1 | 1030      | 100-Year | 1122.00          | 45.23             | 53.51             | 50.05             | 53.52             | 0.000091              | 1.18               | 2667.01              | 692.05            | 0.08         |
| Reach 1 | 1579      | 2-Year   | 252.00           | 45.55             | 50.73             |                   | 50.76             | 0.000258              | 1.47               | 482.19               | 640.72            | 0.13         |
| Reach 1 | 1579      | 10-Year  | 522.00           | 45.55             | 51.89             |                   | 51.90             | 0.000140              | 1.28               | 1409.91              | 956.90            | 0.10         |
| Reach 1 | 1579      | 25-Year  | 728.00           | 45.55             | 52.53             |                   | 52.54             | 0.000104              | 1.19               | 2053.84              | 1024.31           | 0.09         |
| Reach 1 | 1579      | 50-Year  | 920.00           | 45.55             | 53.05             |                   | 53.06             | 0.000087              | 1.15               | 2590.93              | 1056.99           | 0.08         |
| Reach 1 | 1579      | 100-Year | 1122.00          | 45.55             | 53.56             |                   | 53.56             | 0.000075              | 1.12               | 3134.54              | 1089.07           | 0.08         |
| Reach 1 | 1890      | 2-Year   | 252.00           | 44.89             | 50.83             |                   | 50.85             | 0.000314              | 1.43               | 403.80               | 493.08            | 0.13         |
| Reach 1 | 1890      | 10-Year  | 522.00           | 44.89             | 51.94             |                   | 51.95             | 0.000152              | 1.15               | 1030.65              | 731.56            | 0.10         |
| Reach 1 | 1890      | 25-Year  | 728.00           | 44.89             | 52.57             |                   | 52.57             | 0.000103              | 1.04               | 1601.35              | 978.04            | 0.08         |
| Reach 1 | 1890      | 50-Year  | 920.00           | 44.89             | 53.08             |                   | 53.08             | 0.000078              | 0.96               | 2118.69              | 1051.26           | 0.07         |
| Reach 1 | 1890      | 100-Year | 1122.00          | 44.89             | 53.58             |                   | 53.58             | 0.000063              | 0.92               | 2664.86              | 1133.98           | 0.07         |
| Reach 1 | 2517      | 2-Year   | 229.00           | 46.14             | 51.12             |                   | 51.20             | 0.001234              | 2.41               | 143.01               | 190.87            | 0.26         |
| Reach 1 | 2517      | 10-Year  | 462.00           | 46.14             | 52.09             |                   | 52.13             | 0.000771              | 2.24               | 438.64               | 592.58            | 0.21         |
| Reach 1 | 2517      | 25-Year  | 630.00           | 46.14             | 52.66             |                   | 52.69             | 0.000394              | 1.77               | 800.39               | 658.11            | 0.16         |
| Reach 1 | 2517      | 50-Year  | 785.00           | 46.14             | 53.15             |                   | 53.16             | 0.000253              | 1.53               | 1130.41              | 707.03            | 0.13         |
| Reach 1 | 2517      | 100-Year | 963.00           | 46.14             | 53.63             |                   | 53.65             | 0.000182              | 1.40               | 1486.78              | 756.31            | 0.11         |
| Reach 1 | 3185      | 2-Year   | 229.00           | 47.31             | 52.18             |                   | 52.36             | 0.002458              | 3.63               | 93.29                | 175.56            | 0.36         |
| Reach 1 | 3185      | 10-Year  | 462.00           | 47.31             | 52.84             |                   | 52.98             | 0.002264              | 3.92               | 266.18               | 346.91            | 0.36         |
| Reach 1 | 3185      | 25-Year  | 630.00           | 47.31             | 53.11             |                   | 53.24             | 0.002268              | 4.10               | 367.11               | 413.95            | 0.36         |
| Reach 1 | 3185      | 50-Year  | 785.00           | 47.31             | 53.44             |                   | 53.53             | 0.001651              | 3.69               | 515.52               | 473.26            | 0.31         |
| Reach 1 | 3185      | 100-Year | 963.00           | 47.31             | 53.85             |                   | 53.91             | 0.001109              | 3.21               | 720.87               | 534.35            | 0.26         |
| Reach 1 | 3294      | 2-Year   | 229.00           | 48.24             | 52.43             | 50.81             | 52.65             | 0.002482              | 3.77               | 67.55                | 70.28             | 0.37         |
| Reach 1 | 3294      | 10-Year  | 462.00           | 48.24             | 53.01             | 51.97             | 53.53             | 0.005124              | 6.06               | 91.08                | 163.15            | 0.55         |
| Reach 1 | 3294      | 25-Year  | 630.00           | 48.24             | 53.17             | 52.83             | 54.02             | 0.007954              | 7.77               | 97.88                | 190.22            | 0.69         |
| Reach 1 | 3294      | 50-Year  | 785.00           | 48.24             | 53.56             | 53.23             | 53.98             | 0.004733              | 6.38               | 265.47               | 294.01            | 0.54         |
| Reach 1 | 3294      | 100-Year | 963.00           | 48.24             | 53.91             | 53.51             | 54.26             | 0.004034              | 6.21               | 399.85               | 463.97            | 0.51         |
| Reach 1 | 3380      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |

# FORK SWAMP UT1: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp UT1 Reach: Reach 1 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 3462      | 2-Year   | 229.00           | 48.46             | 52.56             | 50.94             | 52.75             | 0.002229              | 3.66               | 78.24                | 61.84             | 0.35         |
| Reach 1 | 3462      | 10-Year  | 462.00           | 48.46             | 53.68             | 52.43             | 53.95             | 0.002459              | 4.65               | 131.64               | 97.92             | 0.39         |
| Reach 1 | 3462      | 25-Year  | 630.00           | 48.46             | 54.54             | 52.91             | 54.82             | 0.002081              | 4.81               | 173.21               | 229.56            | 0.37         |
| Reach 1 | 3462      | 50-Year  | 785.00           | 48.46             | 55.20             | 53.25             | 55.30             | 0.001011              | 3.62               | 480.37               | 299.64            | 0.26         |
| Reach 1 | 3462      | 100-Year | 963.00           | 48.46             | 55.52             | 53.60             | 55.63             | 0.001066              | 3.85               | 586.88               | 370.18            | 0.27         |
| Reach 1 | 3544      | 2-Year   | 127.00           | 48.30             | 52.84             |                   | 52.90             | 0.000637              | 2.01               | 76.08                | 38.08             | 0.19         |
| Reach 1 | 3544      | 10-Year  | 252.00           | 48.30             | 54.04             |                   | 54.12             | 0.000717              | 2.58               | 143.32               | 77.35             | 0.21         |
| Reach 1 | 3544      | 25-Year  | 343.00           | 48.30             | 54.90             |                   | 54.98             | 0.000581              | 2.60               | 232.16               | 129.70            | 0.19         |
| Reach 1 | 3544      | 50-Year  | 425.00           | 48.30             | 55.30             |                   | 55.38             | 0.000615              | 2.80               | 289.76               | 165.23            | 0.20         |
| Reach 1 | 3544      | 100-Year | 517.00           | 48.30             | 55.63             |                   | 55.71             | 0.000619              | 2.91               | 346.36               | 173.07            | 0.21         |
| Reach 1 | 4000      | 2-Year   | 127.00           | 48.08             | 53.07             |                   | 53.09             | 0.000276              | 1.27               | 157.28               | 120.88            | 0.12         |
| Reach 1 | 4000      | 10-Year  | 252.00           | 48.08             | 54.26             |                   | 54.28             | 0.000194              | 1.31               | 333.04               | 167.33            | 0.11         |
| Reach 1 | 4000      | 25-Year  | 343.00           | 48.08             | 55.08             |                   | 55.10             | 0.000138              | 1.23               | 472.58               | 173.97            | 0.09         |
| Reach 1 | 4000      | 50-Year  | 425.00           | 48.08             | 55.49             |                   | 55.50             | 0.000141              | 1.31               | 543.91               | 177.27            | 0.10         |
| Reach 1 | 4000      | 100-Year | 517.00           | 48.08             | 55.82             |                   | 55.84             | 0.000155              | 1.42               | 603.79               | 179.99            | 0.10         |
| Reach 1 | 4181      | 2-Year   | 127.00           | 47.72             | 53.11             | 49.75             | 53.13             | 0.000239              | 1.23               | 103.60               | 31.05             | 0.12         |
| Reach 1 | 4181      | 10-Year  | 252.00           | 47.72             | 54.30             | 50.44             | 54.33             | 0.000285              | 1.58               | 233.65               | 222.56            | 0.13         |
| Reach 1 | 4181      | 25-Year  | 343.00           | 47.72             | 55.11             | 50.86             | 55.13             | 0.000178              | 1.40               | 443.62               | 293.69            | 0.11         |
| Reach 1 | 4181      | 50-Year  | 425.00           | 47.72             | 55.51             | 51.18             | 55.53             | 0.000163              | 1.41               | 570.28               | 328.49            | 0.11         |
| Reach 1 | 4181      | 100-Year | 517.00           | 47.72             | 55.85             | 51.52             | 55.87             | 0.000162              | 1.47               | 686.03               | 357.20            | 0.11         |
| Reach 1 | 4235      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 4289      | 2-Year   | 127.00           | 48.47             | 53.35             | 50.30             | 53.37             | 0.000287              | 1.31               | 97.36                | 50.30             | 0.13         |
| Reach 1 | 4289      | 10-Year  | 252.00           | 48.47             | 54.83             | 51.02             | 54.86             | 0.000221              | 1.46               | 253.31               | 159.03            | 0.12         |
| Reach 1 | 4289      | 25-Year  | 343.00           | 48.47             | 55.26             | 51.43             | 55.29             | 0.000250              | 1.65               | 325.36               | 176.08            | 0.13         |
| Reach 1 | 4289      | 50-Year  | 425.00           | 48.47             | 55.55             | 51.76             | 55.58             | 0.000283              | 1.82               | 376.97               | 187.35            | 0.14         |
| Reach 1 | 4289      | 100-Year | 517.00           | 48.47             | 55.86             | 52.09             | 55.90             | 0.000302              | 1.96               | 439.21               | 208.80            | 0.15         |
| Reach 1 | 4389      | 2-Year   | 123.00           | 48.47             | 53.38             |                   | 53.40             | 0.000254              | 1.24               | 105.68               | 51.19             | 0.12         |
| Reach 1 | 4389      | 10-Year  | 244.00           | 48.47             | 54.85             |                   | 54.88             | 0.000206              | 1.41               | 259.72               | 175.14            | 0.12         |
| Reach 1 | 4389      | 25-Year  | 332.00           | 48.47             | 55.29             |                   | 55.32             | 0.000234              | 1.60               | 343.40               | 211.14            | 0.13         |
| Reach 1 | 4389      | 50-Year  | 412.00           | 48.47             | 55.58             |                   | 55.61             | 0.000261              | 1.76               | 407.69               | 235.08            | 0.13         |
| Reach 1 | 4389      | 100-Year | 500.00           | 48.47             | 55.90             |                   | 55.93             | 0.000272              | 1.87               | 487.27               | 261.65            | 0.14         |

# FORK SWAMP UT1: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp UT1 Reach: Reach 1 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 4764      | 2-Year   | 123.00           | 47.90             | 53.49             |                   | 53.52             | 0.000400              | 1.61               | 86.18                | 47.43             | 0.15         |
| Reach 1 | 4764      | 10-Year  | 244.00           | 47.90             | 54.94             |                   | 54.98             | 0.000322              | 1.82               | 207.05               | 109.02            | 0.14         |
| Reach 1 | 4764      | 25-Year  | 332.00           | 47.90             | 55.38             |                   | 55.43             | 0.000375              | 2.08               | 257.44               | 117.71            | 0.16         |
| Reach 1 | 4764      | 50-Year  | 412.00           | 47.90             | 55.68             |                   | 55.74             | 0.000429              | 2.31               | 296.45               | 148.73            | 0.17         |
| Reach 1 | 4764      | 100-Year | 500.00           | 47.90             | 56.01             |                   | 56.07             | 0.000458              | 2.48               | 353.02               | 229.17            | 0.18         |
| Reach 1 | 5050      | 2-Year   | 123.00           | 49.18             | 53.60             | 50.78             | 53.64             | 0.000390              | 1.48               | 82.97                | 26.62             | 0.15         |
| Reach 1 | 5050      | 10-Year  | 244.00           | 49.18             | 55.04             | 51.47             | 55.10             | 0.000490              | 1.96               | 124.69               | 65.45             | 0.17         |
| Reach 1 | 5050      | 25-Year  | 332.00           | 49.18             | 55.50             | 51.87             | 55.58             | 0.000600              | 2.33               | 163.97               | 97.20             | 0.19         |
| Reach 1 | 5050      | 50-Year  | 412.00           | 49.18             | 55.82             | 52.21             | 55.92             | 0.000690              | 2.61               | 197.93               | 118.93            | 0.21         |
| Reach 1 | 5050      | 100-Year | 500.00           | 49.18             | 56.15             | 52.55             | 56.26             | 0.000747              | 2.84               | 243.55               | 161.14            | 0.22         |
| Reach 1 | 5103      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 5154      | 2-Year   | 123.00           | 49.76             | 54.04             | 51.33             | 54.08             | 0.000463              | 1.61               | 77.82                | 29.81             | 0.16         |
| Reach 1 | 5154      | 10-Year  | 244.00           | 49.76             | 56.07             | 52.07             | 56.10             | 0.000235              | 1.56               | 238.37               | 143.08            | 0.12         |
| Reach 1 | 5154      | 25-Year  | 332.00           | 49.76             | 56.35             | 52.50             | 56.39             | 0.000327              | 1.91               | 283.25               | 174.23            | 0.15         |
| Reach 1 | 5154      | 50-Year  | 412.00           | 49.76             | 56.53             | 52.85             | 56.59             | 0.000416              | 2.20               | 316.27               | 194.76            | 0.17         |
| Reach 1 | 5154      | 100-Year | 500.00           | 49.76             | 56.66             | 53.20             | 56.74             | 0.000531              | 2.53               | 343.00               | 210.50            | 0.19         |
| Reach 1 | 5289      | 2-Year   | 123.00           | 49.08             | 54.10             |                   | 54.17             | 0.000738              | 2.05               | 70.50                | 54.44             | 0.20         |
| Reach 1 | 5289      | 10-Year  | 244.00           | 49.08             | 56.11             |                   | 56.13             | 0.000169              | 1.35               | 369.07               | 231.41            | 0.10         |
| Reach 1 | 5289      | 25-Year  | 332.00           | 49.08             | 56.42             |                   | 56.44             | 0.000204              | 1.54               | 440.69               | 242.82            | 0.12         |
| Reach 1 | 5289      | 50-Year  | 412.00           | 49.08             | 56.62             |                   | 56.64             | 0.000242              | 1.72               | 490.17               | 254.59            | 0.13         |
| Reach 1 | 5289      | 100-Year | 500.00           | 49.08             | 56.77             |                   | 56.80             | 0.000292              | 1.92               | 530.89               | 263.89            | 0.14         |

# FORK SWAMP UT2R1: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp UT2 Reach: Reach 1

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 694.0     | 2-Year   | 330.00           | 45.13             | 50.81             | 47.92             | 50.86             | 0.000799              | 2.15               | 544.13               | 516.60            | 0.17         |
| Reach 1 | 694.0     | 10-Year  | 629.00           | 45.13             | 52.00             | 49.12             | 52.03             | 0.000521              | 2.01               | 1222.38              | 619.81            | 0.15         |
| Reach 1 | 694.0     | 25-Year  | 844.00           | 45.13             | 52.65             | 50.55             | 52.67             | 0.000446              | 2.00               | 1642.25              | 672.02            | 0.14         |
| Reach 1 | 694.0     | 50-Year  | 1035.00          | 45.13             | 53.18             | 50.72             | 53.20             | 0.000395              | 1.98               | 2012.97              | 733.97            | 0.13         |
| Reach 1 | 694.0     | 100-Year | 1246.00          | 45.13             | 53.70             | 50.89             | 53.72             | 0.000358              | 1.97               | 2411.21              | 792.74            | 0.13         |
| Reach 1 | 1255.9    | 2-Year   | 330.00           | 46.84             | 51.47             |                   | 51.58             | 0.002235              | 3.04               | 301.22               | 290.51            | 0.28         |
| Reach 1 | 1255.9    | 10-Year  | 629.00           | 46.84             | 52.46             |                   | 52.55             | 0.001889              | 3.27               | 645.80               | 407.70            | 0.27         |
| Reach 1 | 1255.9    | 25-Year  | 844.00           | 46.84             | 53.05             |                   | 53.12             | 0.001645              | 3.30               | 906.33               | 499.90            | 0.25         |
| Reach 1 | 1255.9    | 50-Year  | 1035.00          | 46.84             | 53.53             |                   | 53.59             | 0.001407              | 3.24               | 1166.01              | 576.99            | 0.24         |
| Reach 1 | 1255.9    | 100-Year | 1246.00          | 46.84             | 54.01             |                   | 54.07             | 0.001212              | 3.17               | 1463.43              | 653.00            | 0.22         |
| Reach 1 | 1877.0    | 2-Year   | 330.00           | 47.35             | 52.58             |                   | 52.66             | 0.001412              | 2.67               | 386.74               | 429.71            | 0.23         |
| Reach 1 | 1877.0    | 10-Year  | 629.00           | 47.35             | 53.46             |                   | 53.53             | 0.001343              | 2.95               | 882.78               | 694.69            | 0.23         |
| Reach 1 | 1877.0    | 25-Year  | 844.00           | 47.35             | 53.92             |                   | 53.98             | 0.001177              | 2.92               | 1215.60              | 743.51            | 0.22         |
| Reach 1 | 1877.0    | 50-Year  | 1035.00          | 47.35             | 54.30             |                   | 54.35             | 0.001056              | 2.89               | 1502.42              | 783.17            | 0.21         |
| Reach 1 | 1877.0    | 100-Year | 1246.00          | 47.35             | 54.69             |                   | 54.73             | 0.000948              | 2.86               | 1816.28              | 824.37            | 0.20         |
| Reach 1 | 2384.0    | 2-Year   | 265.00           | 47.08             | 52.98             |                   | 53.00             | 0.000336              | 1.44               | 651.71               | 461.23            | 0.11         |
| Reach 1 | 2384.0    | 10-Year  | 502.00           | 47.08             | 53.87             |                   | 53.89             | 0.000378              | 1.70               | 1069.25              | 484.52            | 0.12         |
| Reach 1 | 2384.0    | 25-Year  | 672.00           | 47.08             | 54.31             |                   | 54.34             | 0.000418              | 1.88               | 1290.10              | 507.50            | 0.13         |
| Reach 1 | 2384.0    | 50-Year  | 819.00           | 47.08             | 54.68             |                   | 54.70             | 0.000445              | 2.01               | 1476.47              | 521.71            | 0.14         |
| Reach 1 | 2384.0    | 100-Year | 985.00           | 47.08             | 55.05             |                   | 55.07             | 0.000460              | 2.12               | 1672.23              | 531.84            | 0.14         |
| Reach 1 | 2971.0    | 2-Year   | 265.00           | 46.38             | 53.26             |                   | 53.33             | 0.000934              | 2.25               | 246.85               | 216.66            | 0.18         |
| Reach 1 | 2971.0    | 10-Year  | 502.00           | 46.38             | 54.18             |                   | 54.27             | 0.001202              | 2.88               | 490.12               | 310.23            | 0.21         |
| Reach 1 | 2971.0    | 25-Year  | 672.00           | 46.38             | 54.66             |                   | 54.76             | 0.001303              | 3.16               | 650.56               | 367.35            | 0.23         |
| Reach 1 | 2971.0    | 50-Year  | 819.00           | 46.38             | 55.04             |                   | 55.14             | 0.001313              | 3.31               | 803.73               | 439.44            | 0.23         |
| Reach 1 | 2971.0    | 100-Year | 985.00           | 46.38             | 55.42             |                   | 55.51             | 0.001280              | 3.39               | 984.25               | 511.42            | 0.23         |
| Reach 1 | 3403.0    | 2-Year   | 265.00           | 46.52             | 53.66             |                   | 53.75             | 0.001002              | 2.41               | 133.80               | 59.94             | 0.19         |
| Reach 1 | 3403.0    | 10-Year  | 502.00           | 46.52             | 54.71             |                   | 54.84             | 0.001396              | 3.24               | 388.85               | 420.28            | 0.23         |
| Reach 1 | 3403.0    | 25-Year  | 672.00           | 46.52             | 55.22             |                   | 55.34             | 0.001353              | 3.37               | 608.24               | 444.05            | 0.23         |
| Reach 1 | 3403.0    | 50-Year  | 819.00           | 46.52             | 55.59             |                   | 55.71             | 0.001295              | 3.42               | 779.03               | 461.71            | 0.23         |
| Reach 1 | 3403.0    | 100-Year | 985.00           | 46.52             | 55.96             |                   | 56.07             | 0.001259              | 3.49               | 952.21               | 484.57            | 0.23         |
| Reach 1 | 3469.8    | 2-Year   | 265.00           | 46.75             | 53.73             | 49.45             | 53.82             | 0.000935              | 2.36               | 116.51               | 124.09            | 0.18         |
| Reach 1 | 3469.8    | 10-Year  | 502.00           | 46.75             | 54.80             | 50.63             | 54.94             | 0.001312              | 3.17               | 341.63               | 372.71            | 0.22         |



# FORK SWAMP UT2R1: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp UT2 Reach: Reach 1 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 3469.8    | 25-Year  | 672.00           | 46.75             | 55.32             | 51.33             | 55.43             | 0.001175              | 3.16               | 662.82               | 425.16            | 0.21         |
| Reach 1 | 3469.8    | 50-Year  | 819.00           | 46.75             | 55.69             | 51.89             | 55.79             | 0.001178              | 3.28               | 822.35               | 441.74            | 0.22         |
| Reach 1 | 3469.8    | 100-Year | 985.00           | 46.75             | 56.05             | 52.52             | 56.15             | 0.001182              | 3.40               | 983.05               | 450.87            | 0.22         |
| Reach 1 | 3499.8    |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 3529.8    | 2-Year   | 265.00           | 46.96             | 55.91             | 49.66             | 55.93             | 0.000163              | 1.22               | 552.83               | 442.11            | 0.08         |
| Reach 1 | 3529.8    | 10-Year  | 502.00           | 46.96             | 56.41             | 50.85             | 56.43             | 0.000265              | 1.63               | 1052.60              | 454.77            | 0.10         |
| Reach 1 | 3529.8    | 25-Year  | 672.00           | 46.96             | 56.63             | 51.53             | 56.66             | 0.000388              | 2.01               | 1152.19              | 460.29            | 0.13         |
| Reach 1 | 3529.8    | 50-Year  | 819.00           | 46.96             | 56.78             | 52.09             | 56.83             | 0.000502              | 2.32               | 1223.60              | 464.21            | 0.14         |
| Reach 1 | 3529.8    | 100-Year | 985.00           | 46.96             | 56.94             | 52.73             | 57.00             | 0.000647              | 2.66               | 1298.22              | 481.44            | 0.16         |
| Reach 1 | 3921.0    | 2-Year   | 265.00           | 48.00             | 55.97             |                   | 55.98             | 0.000100              | 0.98               | 1017.55              | 449.32            | 0.07         |
| Reach 1 | 3921.0    | 10-Year  | 502.00           | 48.00             | 56.52             |                   | 56.53             | 0.000219              | 1.53               | 1273.05              | 495.41            | 0.10         |
| Reach 1 | 3921.0    | 25-Year  | 672.00           | 48.00             | 56.78             |                   | 56.80             | 0.000314              | 1.88               | 1406.94              | 517.93            | 0.12         |
| Reach 1 | 3921.0    | 50-Year  | 819.00           | 48.00             | 56.98             |                   | 57.00             | 0.000396              | 2.15               | 1510.55              | 534.70            | 0.14         |
| Reach 1 | 3921.0    | 100-Year | 985.00           | 48.00             | 57.19             |                   | 57.22             | 0.000482              | 2.41               | 1624.33              | 549.04            | 0.15         |

# FORK SWAMP UT2R2: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp UT2 Reach: Reach 2

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 41        | 2-Year   | 131.00           | 57.18             | 60.52             | 59.51             | 60.72             | 0.004302              | 3.67               | 35.68                | 17.92             | 0.46         |
| Reach 2 | 41        | 10-Year  | 241.00           | 57.18             | 61.53             | 60.26             | 61.82             | 0.004301              | 4.33               | 55.63                | 21.57             | 0.48         |
| Reach 2 | 41        | 25-Year  | 319.00           | 57.18             | 62.09             | 60.69             | 62.43             | 0.004303              | 4.67               | 68.35                | 23.60             | 0.48         |
| Reach 2 | 41        | 50-Year  | 389.00           | 57.18             | 62.53             | 61.01             | 62.91             | 0.004301              | 4.92               | 79.14                | 25.20             | 0.49         |
| Reach 2 | 41        | 100-Year | 465.00           | 57.18             | 62.96             | 61.35             | 63.37             | 0.004305              | 5.15               | 90.28                | 26.75             | 0.49         |
| Reach 2 | 144       | 2-Year   | 131.00           | 56.44             | 60.92             | 59.13             | 61.01             | 0.001531              | 2.39               | 54.82                | 24.35             | 0.28         |
| Reach 2 | 144       | 10-Year  | 241.00           | 56.44             | 62.00             | 59.87             | 62.12             | 0.001648              | 2.86               | 84.20                | 30.14             | 0.30         |
| Reach 2 | 144       | 25-Year  | 319.00           | 56.44             | 62.60             | 60.29             | 62.74             | 0.001677              | 3.09               | 103.23               | 33.36             | 0.31         |
| Reach 2 | 144       | 50-Year  | 389.00           | 56.44             | 63.07             | 60.60             | 63.23             | 0.001688              | 3.26               | 119.50               | 35.88             | 0.31         |
| Reach 2 | 144       | 100-Year | 465.00           | 56.44             | 63.52             | 60.91             | 63.70             | 0.001694              | 3.41               | 136.45               | 38.33             | 0.32         |
| Reach 2 | 220       |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 303       | 2-Year   | 131.00           | 58.23             | 61.05             | 59.32             | 61.07             | 0.000411              | 1.20               | 109.03               | 53.51             | 0.15         |
| Reach 2 | 303       | 10-Year  | 241.00           | 58.23             | 62.32             | 59.68             | 62.35             | 0.000308              | 1.31               | 183.35               | 63.15             | 0.14         |
| Reach 2 | 303       | 25-Year  | 319.00           | 58.23             | 63.08             | 59.90             | 63.11             | 0.000267              | 1.37               | 234.16               | 75.56             | 0.13         |
| Reach 2 | 303       | 50-Year  | 389.00           | 58.23             | 63.70             | 60.06             | 63.73             | 0.000227              | 1.40               | 287.94               | 109.81            | 0.12         |
| Reach 2 | 303       | 100-Year | 465.00           | 58.23             | 64.34             | 60.24             | 64.37             | 0.000192              | 1.42               | 353.70               | 219.44            | 0.12         |
| Reach 2 | 460       | 2-Year   | 93.00            | 58.69             | 60.97             | 60.82             | 61.47             | 0.017865              | 5.68               | 16.38                | 12.52             | 0.87         |
| Reach 2 | 460       | 10-Year  | 179.00           | 58.69             | 62.26             |                   | 62.64             | 0.007774              | 4.93               | 36.34                | 18.27             | 0.62         |
| Reach 2 | 460       | 25-Year  | 242.00           | 58.69             | 63.02             |                   | 63.36             | 0.005598              | 4.70               | 51.48                | 21.64             | 0.54         |
| Reach 2 | 460       | 50-Year  | 298.00           | 58.69             | 63.64             |                   | 63.96             | 0.004414              | 4.53               | 65.75                | 24.39             | 0.49         |
| Reach 2 | 460       | 100-Year | 359.00           | 58.69             | 64.27             | 62.61             | 64.56             | 0.003441              | 4.34               | 88.16                | 60.04             | 0.44         |
| Reach 2 | 783       | 2-Year   | 93.00            | 58.90             | 62.89             | 61.39             | 62.99             | 0.002041              | 2.51               | 37.05                | 18.58             | 0.31         |
| Reach 2 | 783       | 10-Year  | 179.00           | 58.90             | 63.81             |                   | 63.97             | 0.002484              | 3.18               | 56.26                | 22.93             | 0.36         |
| Reach 2 | 783       | 25-Year  | 242.00           | 58.90             | 64.37             |                   | 64.56             | 0.002559              | 3.47               | 69.77                | 25.55             | 0.37         |
| Reach 2 | 783       | 50-Year  | 298.00           | 58.90             | 64.82             |                   | 65.03             | 0.002525              | 3.65               | 81.92                | 36.39             | 0.37         |
| Reach 2 | 783       | 100-Year | 359.00           | 58.90             | 65.24             |                   | 65.45             | 0.002221              | 3.74               | 116.26               | 123.66            | 0.36         |
| Reach 2 | 1103      | 2-Year   | 93.00            | 61.08             | 63.76             |                   | 63.92             | 0.004330              | 3.25               | 28.59                | 17.68             | 0.45         |
| Reach 2 | 1103      | 10-Year  | 179.00           | 61.08             | 64.75             |                   | 64.96             | 0.003819              | 3.69               | 48.51                | 22.46             | 0.44         |
| Reach 2 | 1103      | 25-Year  | 242.00           | 61.08             | 65.30             |                   | 65.54             | 0.003646              | 3.92               | 61.72                | 25.13             | 0.44         |
| Reach 2 | 1103      | 50-Year  | 298.00           | 61.08             | 65.73             |                   | 65.99             | 0.003530              | 4.09               | 72.92                | 27.19             | 0.44         |
| Reach 2 | 1103      | 100-Year | 359.00           | 61.08             | 66.08             | 64.55             | 66.37             | 0.003608              | 4.32               | 90.88                | 172.14            | 0.45         |

# FORK SWAMP UT2R2: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp UT2 Reach: Reach 2 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 1537      | 2-Year   | 93.00            | 61.92             | 65.52             |                   | 65.70             | 0.003870              | 3.47               | 26.77                | 12.12             | 0.41         |
| Reach 2 | 1537      | 10-Year  | 179.00           | 61.92             | 66.58             |                   | 66.83             | 0.004795              | 4.04               | 45.90                | 37.57             | 0.47         |
| Reach 2 | 1537      | 25-Year  | 242.00           | 61.92             | 67.02             |                   | 67.29             | 0.004441              | 4.30               | 71.60                | 78.71             | 0.47         |
| Reach 2 | 1537      | 50-Year  | 298.00           | 61.92             | 67.35             | 66.16             | 67.60             | 0.003885              | 4.30               | 103.06               | 109.33            | 0.44         |
| Reach 2 | 1537      | 100-Year | 359.00           | 61.92             | 67.66             |                   | 67.88             | 0.003323              | 4.22               | 142.35               | 162.39            | 0.42         |
| Reach 2 | 1961      | 2-Year   | 101.00           | 63.79             | 67.61             |                   | 67.92             | 0.006955              | 4.48               | 22.52                | 10.07             | 0.53         |
| Reach 2 | 1961      | 10-Year  | 180.00           | 63.79             | 68.41             | 67.49             | 68.53             | 0.003368              | 3.52               | 185.17               | 549.29            | 0.38         |
| Reach 2 | 1961      | 25-Year  | 235.00           | 63.79             | 68.60             | 68.43             | 68.66             | 0.002389              | 3.06               | 294.44               | 608.96            | 0.32         |
| Reach 2 | 1961      | 50-Year  | 283.00           | 63.79             | 68.73             | 68.49             | 68.78             | 0.001992              | 2.86               | 379.14               | 658.57            | 0.29         |
| Reach 2 | 1961      | 100-Year | 336.00           | 63.79             | 68.86             |                   | 68.89             | 0.001716              | 2.71               | 465.96               | 699.03            | 0.27         |
| Reach 2 | 2341      | 2-Year   | 101.00           | 66.19             | 69.86             | 69.80             | 69.98             | 0.004298              | 3.49               | 96.04                | 355.66            | 0.41         |
| Reach 2 | 2341      | 10-Year  | 180.00           | 66.19             | 70.05             | 70.02             | 70.20             | 0.005934              | 4.28               | 184.37               | 604.31            | 0.49         |
| Reach 2 | 2341      | 25-Year  | 235.00           | 66.19             | 70.11             | 70.11             | 70.26             | 0.006949              | 4.71               | 219.95               | 609.87            | 0.53         |
| Reach 2 | 2341      | 50-Year  | 283.00           | 66.19             | 70.15             | 70.15             | 70.31             | 0.007892              | 5.07               | 244.68               | 613.71            | 0.57         |
| Reach 2 | 2341      | 100-Year | 336.00           | 66.19             | 70.19             | 70.19             | 70.36             | 0.008715              | 5.39               | 270.81               | 617.74            | 0.60         |
| Reach 2 | 2702      | 2-Year   | 49.00            | 68.82             | 71.00             |                   | 71.02             | 0.001470              | 1.52               | 64.40                | 94.49             | 0.25         |
| Reach 2 | 2702      | 10-Year  | 90.00            | 68.82             | 71.39             |                   | 71.42             | 0.001488              | 1.82               | 107.52               | 126.91            | 0.26         |
| Reach 2 | 2702      | 25-Year  | 118.00           | 68.82             | 71.56             |                   | 71.60             | 0.001529              | 1.97               | 131.83               | 146.03            | 0.27         |
| Reach 2 | 2702      | 50-Year  | 143.00           | 68.82             | 71.70             |                   | 71.74             | 0.001546              | 2.07               | 153.30               | 161.04            | 0.27         |
| Reach 2 | 2702      | 100-Year | 171.00           | 68.82             | 71.83             |                   | 71.87             | 0.001598              | 2.19               | 174.82               | 174.18            | 0.28         |
| Reach 2 | 3063      | 2-Year   | 49.00            | 70.87             | 71.48             |                   | 71.48             | 0.001116              | 0.64               | 92.22                | 182.80            | 0.18         |
| Reach 2 | 3063      | 10-Year  | 90.00            | 70.87             | 71.81             |                   | 71.81             | 0.000847              | 0.72               | 177.51               | 308.10            | 0.17         |
| Reach 2 | 3063      | 25-Year  | 118.00           | 70.87             | 71.95             |                   | 71.95             | 0.000709              | 0.72               | 221.91               | 313.66            | 0.16         |
| Reach 2 | 3063      | 50-Year  | 143.00           | 70.87             | 72.07             |                   | 72.08             | 0.000619              | 0.72               | 262.79               | 356.24            | 0.15         |
| Reach 2 | 3063      | 100-Year | 171.00           | 70.87             | 72.19             |                   | 72.20             | 0.000569              | 0.73               | 306.77               | 391.99            | 0.15         |
| Reach 2 | 3304      | 2-Year   | 49.00            | 69.69             | 71.49             |                   | 71.49             | 0.000010              | 0.12               | 442.47               | 443.69            | 0.02         |
| Reach 2 | 3304      | 10-Year  | 90.00            | 69.69             | 71.82             |                   | 71.82             | 0.000014              | 0.17               | 597.10               | 494.74            | 0.03         |
| Reach 2 | 3304      | 25-Year  | 118.00           | 69.69             | 71.97             |                   | 71.97             | 0.000017              | 0.20               | 670.34               | 516.47            | 0.03         |
| Reach 2 | 3304      | 50-Year  | 143.00           | 69.69             | 72.09             |                   | 72.09             | 0.000026              | 0.25               | 777.98               | 973.39            | 0.04         |
| Reach 2 | 3304      | 100-Year | 171.00           | 69.69             | 72.21             |                   | 72.21             | 0.000027              | 0.27               | 895.41               | 1019.20           | 0.04         |
| Reach 2 | 3669      | 2-Year   | 49.00            | 68.21             | 71.50             |                   | 71.50             | 0.000032              | 0.35               | 249.19               | 267.96            | 0.04         |
| Reach 2 | 3669      | 10-Year  | 90.00            | 68.21             | 71.83             |                   | 71.83             | 0.000044              | 0.45               | 345.21               | 310.78            | 0.05         |

# FORK SWAMP UT2R2: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base River: Fork Swamp UT2 Reach: Reach 2 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 3669      | 25-Year  | 118.00           | 68.21             | 71.98             |                   | 71.98             | 0.000052              | 0.51               | 392.07               | 329.04            | 0.05         |
| Reach 2 | 3669      | 50-Year  | 143.00           | 68.21             | 72.11             |                   | 72.11             | 0.000057              | 0.55               | 454.38               | 510.41            | 0.06         |
| Reach 2 | 3669      | 100-Year | 171.00           | 68.21             | 72.22             |                   | 72.23             | 0.000061              | 0.58               | 515.15               | 517.34            | 0.06         |
| Reach 2 | 4005      | 2-Year   | 49.00            | 65.68             | 71.50             |                   | 71.50             | 0.000003              | 0.16               | 567.36               | 406.32            | 0.01         |
| Reach 2 | 4005      | 10-Year  | 90.00            | 65.68             | 71.83             |                   | 71.83             | 0.000006              | 0.23               | 705.51               | 422.41            | 0.02         |
| Reach 2 | 4005      | 25-Year  | 118.00           | 65.68             | 71.98             |                   | 71.98             | 0.000008              | 0.27               | 768.56               | 429.55            | 0.02         |
| Reach 2 | 4005      | 50-Year  | 143.00           | 65.68             | 72.11             |                   | 72.12             | 0.000010              | 0.31               | 862.48               | 758.77            | 0.03         |
| Reach 2 | 4005      | 100-Year | 171.00           | 65.68             | 72.23             |                   | 72.23             | 0.000012              | 0.34               | 953.93               | 774.47            | 0.03         |
| Reach 2 | 4262      | 2-Year   | 49.00            | 64.48             | 71.50             |                   | 71.50             | 0.000002              | 0.15               | 743.96               | 369.46            | 0.01         |
| Reach 2 | 4262      | 10-Year  | 90.00            | 64.48             | 71.84             |                   | 71.84             | 0.000004              | 0.23               | 868.10               | 373.84            | 0.02         |
| Reach 2 | 4262      | 25-Year  | 118.00           | 64.48             | 71.98             |                   | 71.98             | 0.000006              | 0.28               | 923.77               | 375.78            | 0.02         |
| Reach 2 | 4262      | 50-Year  | 143.00           | 64.48             | 72.12             |                   | 72.12             | 0.000008              | 0.32               | 973.88               | 377.52            | 0.02         |
| Reach 2 | 4262      | 100-Year | 171.00           | 64.48             | 72.24             |                   | 72.24             | 0.000010              | 0.37               | 1019.18              | 379.09            | 0.03         |

# FORK SWAMP UT3: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 3 | 237.0     | 2 YR    | 448.00           | 45.84             | 50.66             | 50.40             | 50.79             | 0.003504              | 3.72               | 543.09               | 891.81            | 0.36         |
| Reach 3 | 237.0     | 10 YR   | 851.00           | 45.84             | 51.19             | 50.73             | 51.29             | 0.003504              | 4.10               | 1141.73              | 1400.35           | 0.37         |
| Reach 3 | 237.0     | 25 YR   | 1142.00          | 45.84             | 51.42             | 50.89             | 51.51             | 0.003501              | 4.26               | 1485.41              | 1550.96           | 0.37         |
| Reach 3 | 237.0     | 50 YR   | 1399.00          | 45.84             | 51.59             | 51.10             | 51.68             | 0.003502              | 4.39               | 1767.91              | 1664.58           | 0.37         |
| Reach 3 | 237.0     | 100 YR  | 1679.00          | 45.84             | 51.75             | 51.20             | 51.83             | 0.003503              | 4.50               | 2039.31              | 1727.81           | 0.38         |
| Reach 3 | 614.5     | 2 YR    | 448.00           | 47.18             | 51.52             |                   | 51.54             | 0.001268              | 2.02               | 970.17               | 906.53            | 0.21         |
| Reach 3 | 614.5     | 10 YR   | 851.00           | 47.18             | 52.07             |                   | 52.09             | 0.001415              | 2.40               | 1499.93              | 1034.80           | 0.23         |
| Reach 3 | 614.5     | 25 YR   | 1142.00          | 47.18             | 52.38             |                   | 52.41             | 0.001683              | 2.77               | 1850.41              | 1263.22           | 0.25         |
| Reach 3 | 614.5     | 50 YR   | 1399.00          | 47.18             | 52.58             |                   | 52.61             | 0.001807              | 2.97               | 2110.55              | 1305.18           | 0.27         |
| Reach 3 | 614.5     | 100 YR  | 1679.00          | 47.18             | 52.76             |                   | 52.79             | 0.001891              | 3.13               | 2343.29              | 1313.10           | 0.27         |
| Reach 3 | 1000.0    | 2 YR    | 448.00           | 47.70             | 52.07             |                   | 52.10             | 0.001651              | 2.32               | 987.35               | 1286.25           | 0.24         |
| Reach 3 | 1000.0    | 10 YR   | 851.00           | 47.70             | 52.61             |                   | 52.63             | 0.001354              | 2.35               | 1716.71              | 1401.93           | 0.22         |
| Reach 3 | 1000.0    | 25 YR   | 1142.00          | 47.70             | 52.94             |                   | 52.96             | 0.001213              | 2.37               | 2193.08              | 1462.33           | 0.22         |
| Reach 3 | 1000.0    | 50 YR   | 1399.00          | 47.70             | 53.16             |                   | 53.18             | 0.001222              | 2.47               | 2523.69              | 1529.74           | 0.22         |
| Reach 3 | 1000.0    | 100 YR  | 1679.00          | 47.70             | 53.36             |                   | 53.38             | 0.001265              | 2.60               | 2829.89              | 1562.35           | 0.22         |
| Reach 3 | 1481.0    | 2 YR    | 448.00           | 47.90             | 52.82             |                   | 52.86             | 0.001531              | 2.51               | 764.44               | 746.76            | 0.24         |
| Reach 3 | 1481.0    | 10 YR   | 851.00           | 47.90             | 53.35             |                   | 53.40             | 0.001881              | 3.06               | 1173.29              | 831.83            | 0.27         |
| Reach 3 | 1481.0    | 25 YR   | 1142.00          | 47.90             | 53.66             |                   | 53.71             | 0.002024              | 3.34               | 1445.36              | 908.18            | 0.28         |
| Reach 3 | 1481.0    | 50 YR   | 1399.00          | 47.90             | 53.90             |                   | 53.95             | 0.002107              | 3.53               | 1663.06              | 939.08            | 0.29         |
| Reach 3 | 1481.0    | 100 YR  | 1679.00          | 47.90             | 54.12             |                   | 54.17             | 0.002194              | 3.72               | 1878.46              | 968.69            | 0.30         |
| Reach 3 | 1948.0    | 2 YR    | 448.00           | 48.10             | 53.27             |                   | 53.28             | 0.000573              | 1.61               | 1061.13              | 615.10            | 0.15         |
| Reach 3 | 1948.0    | 10 YR   | 851.00           | 48.10             | 53.92             |                   | 53.94             | 0.000784              | 2.10               | 1467.36              | 629.50            | 0.18         |
| Reach 3 | 1948.0    | 25 YR   | 1142.00          | 48.10             | 54.29             |                   | 54.31             | 0.000896              | 2.37               | 1703.43              | 638.65            | 0.19         |
| Reach 3 | 1948.0    | 50 YR   | 1399.00          | 48.10             | 54.57             |                   | 54.60             | 0.000987              | 2.58               | 1883.86              | 645.60            | 0.20         |
| Reach 3 | 1948.0    | 100 YR  | 1679.00          | 48.10             | 54.84             |                   | 54.87             | 0.001080              | 2.80               | 2060.29              | 654.23            | 0.22         |
| Reach 3 | 2532.0    | 2 YR    | 413.00           | 48.25             | 53.77             |                   | 53.97             | 0.003175              | 4.02               | 307.65               | 436.88            | 0.35         |
| Reach 3 | 2532.0    | 10 YR   | 775.00           | 48.25             | 54.58             |                   | 54.74             | 0.002772              | 4.25               | 693.45               | 501.04            | 0.34         |
| Reach 3 | 2532.0    | 25 YR   | 1041.00          | 48.25             | 55.02             |                   | 55.17             | 0.002654              | 4.41               | 920.49               | 527.06            | 0.34         |
| Reach 3 | 2532.0    | 50 YR   | 1273.00          | 48.25             | 55.36             |                   | 55.50             | 0.002641              | 4.58               | 1103.40              | 563.55            | 0.34         |
| Reach 3 | 2532.0    | 100 YR  | 1525.00          | 48.25             | 55.68             |                   | 55.82             | 0.002622              | 4.74               | 1290.88              | 594.54            | 0.34         |
| Reach 3 | 3000.0    | 2 YR    | 413.00           | 48.35             | 54.89             |                   | 55.05             | 0.001747              | 3.47               | 204.43               | 89.48             | 0.27         |
| Reach 3 | 3000.0    | 10 YR   | 775.00           | 48.35             | 55.83             |                   | 56.18             | 0.003165              | 5.23               | 326.53               | 186.43            | 0.38         |

# FORK SWAMP UT3: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 3 | 3000.0    | 25 YR   | 1041.00          | 48.35             | 56.31             |                   | 56.78             | 0.004037              | 6.22               | 444.16               | 290.49            | 0.43         |
| Reach 3 | 3000.0    | 50 YR   | 1273.00          | 48.35             | 56.66             | 54.77             | 57.16             | 0.004303              | 6.65               | 551.14               | 314.72            | 0.45         |
| Reach 3 | 3000.0    | 100 YR  | 1525.00          | 48.35             | 56.99             | 54.85             | 57.52             | 0.004528              | 7.04               | 660.43               | 337.69            | 0.46         |
| Reach 3 | 3500.0    | 2 YR    | 413.00           | 48.57             | 55.73             |                   | 55.86             | 0.001476              | 2.95               | 181.33               | 171.17            | 0.25         |
| Reach 3 | 3500.0    | 10 YR   | 775.00           | 48.57             | 57.10             |                   | 57.26             | 0.001522              | 3.58               | 451.35               | 221.55            | 0.26         |
| Reach 3 | 3500.0    | 25 YR   | 1041.00          | 48.57             | 57.81             |                   | 57.99             | 0.001546              | 3.89               | 621.58               | 255.43            | 0.27         |
| Reach 3 | 3500.0    | 50 YR   | 1273.00          | 48.57             | 58.25             |                   | 58.45             | 0.001657              | 4.21               | 746.23               | 309.45            | 0.28         |
| Reach 3 | 3500.0    | 100 YR  | 1525.00          | 48.57             | 58.67             |                   | 58.88             | 0.001757              | 4.50               | 882.49               | 350.13            | 0.29         |
| Reach 3 | 3830.0    | 2 YR    | 413.00           | 49.16             | 56.22             |                   | 56.36             | 0.001542              | 2.97               | 175.32               | 133.27            | 0.25         |
| Reach 3 | 3830.0    | 10 YR   | 775.00           | 49.16             | 57.60             |                   | 57.74             | 0.001393              | 3.39               | 554.66               | 388.89            | 0.25         |
| Reach 3 | 3830.0    | 25 YR   | 1041.00          | 49.16             | 58.32             |                   | 58.44             | 0.001202              | 3.40               | 878.88               | 535.81            | 0.24         |
| Reach 3 | 3830.0    | 50 YR   | 1273.00          | 49.16             | 58.80             |                   | 58.90             | 0.001089              | 3.39               | 1189.71              | 706.83            | 0.23         |
| Reach 3 | 3830.0    | 100 YR  | 1525.00          | 49.16             | 59.23             |                   | 59.32             | 0.001002              | 3.39               | 1508.26              | 750.17            | 0.22         |
| Reach 3 | 4129.0    | 2 YR    | 413.00           | 49.79             | 56.70             |                   | 56.84             | 0.001661              | 3.01               | 166.36               | 65.27             | 0.26         |
| Reach 3 | 4129.0    | 10 YR   | 775.00           | 49.79             | 58.05             |                   | 58.27             | 0.002058              | 4.03               | 269.35               | 88.67             | 0.30         |
| Reach 3 | 4129.0    | 25 YR   | 1041.00          | 49.79             | 58.68             |                   | 59.02             | 0.002642              | 4.91               | 363.85               | 284.70            | 0.35         |
| Reach 3 | 4129.0    | 50 YR   | 1273.00          | 49.79             | 59.11             |                   | 59.47             | 0.002804              | 5.28               | 517.47               | 427.99            | 0.36         |
| Reach 3 | 4129.0    | 100 YR  | 1525.00          | 49.79             | 59.51             |                   | 59.87             | 0.002732              | 5.42               | 711.41               | 523.70            | 0.36         |
| Reach 3 | 4545      | 2 YR    | 413.00           | 49.53             | 57.23             |                   | 57.30             | 0.000779              | 2.14               | 255.35               | 157.88            | 0.18         |
| Reach 3 | 4545      | 10 YR   | 775.00           | 49.53             | 58.64             |                   | 58.68             | 0.000547              | 2.13               | 901.94               | 676.96            | 0.16         |
| Reach 3 | 4545      | 25 YR   | 1041.00          | 49.53             | 59.35             |                   | 59.37             | 0.000372              | 1.90               | 1402.14              | 729.07            | 0.13         |
| Reach 3 | 4545      | 50 YR   | 1273.00          | 49.53             | 59.78             |                   | 59.81             | 0.000323              | 1.85               | 1725.31              | 755.82            | 0.12         |
| Reach 3 | 4545      | 100 YR  | 1525.00          | 49.53             | 60.16             |                   | 60.18             | 0.000300              | 1.85               | 2013.81              | 771.92            | 0.12         |
| Reach 3 | 4815      | 2 YR    | 351.00           | 49.53             | 57.43             |                   | 57.49             | 0.000640              | 1.99               | 197.86               | 72.66             | 0.16         |
| Reach 3 | 4815      | 10 YR   | 653.00           | 49.53             | 58.78             |                   | 58.86             | 0.000694              | 2.45               | 491.82               | 378.72            | 0.18         |
| Reach 3 | 4815      | 25 YR   | 876.00           | 49.53             | 59.44             |                   | 59.51             | 0.000619              | 2.48               | 766.10               | 437.51            | 0.17         |
| Reach 3 | 4815      | 50 YR   | 1069.00          | 49.53             | 59.87             |                   | 59.93             | 0.000602              | 2.55               | 957.20               | 466.90            | 0.17         |
| Reach 3 | 4815      | 100 YR  | 1278.00          | 49.53             | 60.24             |                   | 60.30             | 0.000588              | 2.61               | 1153.66              | 568.22            | 0.17         |
| Reach 3 | 4953      | 2 YR    | 351.00           | 49.00             | 57.52             | 52.00             | 57.57             | 0.000405              | 1.69               | 208.23               | 63.14             | 0.13         |
| Reach 3 | 4953      | 10 YR   | 653.00           | 49.00             | 58.87             | 53.18             | 58.95             | 0.000594              | 2.38               | 380.81               | 321.00            | 0.16         |
| Reach 3 | 4953      | 25 YR   | 876.00           | 49.00             | 59.52             | 53.87             | 59.61             | 0.000624              | 2.60               | 616.10               | 390.67            | 0.17         |
| Reach 3 | 4953      | 50 YR   | 1069.00          | 49.00             | 59.94             | 54.39             | 60.03             | 0.000645              | 2.74               | 787.41               | 424.18            | 0.17         |

# FORK SWAMP UT3: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 3 | 4953      | 100 YR  | 1278.00          | 49.00             | 60.31             | 54.91             | 60.40             | 0.000667              | 2.87               | 950.26               | 450.99            | 0.18         |
| Reach 3 | 5065      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 3 | 5206      | 2 YR    | 351.00           | 50.65             | 57.85             | 53.91             | 57.91             | 0.000713              | 2.06               | 175.69               | 126.23            | 0.17         |
| Reach 3 | 5206      | 10 YR   | 653.00           | 50.65             | 59.87             | 55.02             | 59.89             | 0.000118              | 1.08               | 611.86               | 245.74            | 0.07         |
| Reach 3 | 5206      | 25 YR   | 876.00           | 50.65             | 60.30             | 55.66             | 60.33             | 0.000125              | 1.15               | 723.32               | 271.92            | 0.08         |
| Reach 3 | 5206      | 50 YR   | 1069.00          | 50.65             | 60.56             | 56.14             | 60.60             | 0.000138              | 1.24               | 796.72               | 292.15            | 0.08         |
| Reach 3 | 5206      | 100 YR  | 1278.00          | 50.65             | 60.78             | 56.60             | 60.83             | 0.000154              | 1.34               | 863.58               | 315.25            | 0.09         |
| Reach 3 | 5363      | 2 YR    | 342.00           | 50.34             | 57.96             |                   | 58.03             | 0.000731              | 2.06               | 190.69               | 113.71            | 0.17         |
| Reach 3 | 5363      | 10 YR   | 635.00           | 50.34             | 59.89             |                   | 59.94             | 0.000441              | 2.03               | 560.86               | 267.66            | 0.14         |
| Reach 3 | 5363      | 25 YR   | 852.00           | 50.34             | 60.32             |                   | 60.38             | 0.000540              | 2.35               | 684.02               | 293.93            | 0.16         |
| Reach 3 | 5363      | 50 YR   | 1039.00          | 50.34             | 60.59             |                   | 60.66             | 0.000639              | 2.62               | 762.59               | 303.68            | 0.17         |
| Reach 3 | 5363      | 100 YR  | 1242.00          | 50.34             | 60.81             |                   | 60.89             | 0.000758              | 2.91               | 830.82               | 311.91            | 0.19         |
| Reach 3 | 5832      | 2 YR    | 342.00           | 50.38             | 58.33             |                   | 58.41             | 0.000892              | 2.25               | 156.98               | 65.78             | 0.19         |
| Reach 3 | 5832      | 10 YR   | 635.00           | 50.38             | 60.13             |                   | 60.22             | 0.000793              | 2.59               | 339.22               | 163.57            | 0.19         |
| Reach 3 | 5832      | 25 YR   | 852.00           | 50.38             | 60.61             |                   | 60.73             | 0.000942              | 2.97               | 429.42               | 201.74            | 0.20         |
| Reach 3 | 5832      | 50 YR   | 1039.00          | 50.38             | 60.93             |                   | 61.05             | 0.001051              | 3.23               | 494.82               | 218.55            | 0.22         |
| Reach 3 | 5832      | 100 YR  | 1242.00          | 50.38             | 61.20             |                   | 61.35             | 0.001160              | 3.49               | 557.62               | 233.55            | 0.23         |
| Reach 3 | 6307      | 2 YR    | 342.00           | 50.89             | 58.84             |                   | 58.95             | 0.001443              | 2.73               | 125.44               | 29.10             | 0.23         |
| Reach 3 | 6307      | 10 YR   | 635.00           | 50.89             | 60.57             |                   | 60.71             | 0.001285              | 3.15               | 295.92               | 186.46            | 0.23         |
| Reach 3 | 6307      | 25 YR   | 852.00           | 50.89             | 61.12             |                   | 61.26             | 0.001298              | 3.36               | 410.94               | 229.12            | 0.23         |
| Reach 3 | 6307      | 50 YR   | 1039.00          | 50.89             | 61.47             |                   | 61.61             | 0.001286              | 3.47               | 498.08               | 270.57            | 0.24         |
| Reach 3 | 6307      | 100 YR  | 1242.00          | 50.89             | 61.79             |                   | 61.92             | 0.001254              | 3.53               | 593.28               | 329.76            | 0.23         |
| Reach 3 | 6769      | 2 YR    | 342.00           | 51.67             | 59.43             |                   | 59.52             | 0.001063              | 2.42               | 141.06               | 31.44             | 0.20         |
| Reach 3 | 6769      | 10 YR   | 635.00           | 51.67             | 61.15             |                   | 61.28             | 0.001187              | 2.99               | 279.98               | 158.05            | 0.22         |
| Reach 3 | 6769      | 25 YR   | 852.00           | 51.67             | 61.71             |                   | 61.87             | 0.001335              | 3.38               | 382.57               | 198.17            | 0.24         |
| Reach 3 | 6769      | 50 YR   | 1039.00          | 51.67             | 62.08             |                   | 62.25             | 0.001447              | 3.66               | 465.28               | 310.32            | 0.25         |
| Reach 3 | 6769      | 100 YR  | 1242.00          | 51.67             | 62.39             |                   | 62.56             | 0.001483              | 3.82               | 568.15               | 334.03            | 0.26         |
| Reach 2 | 7068      | 2 YR    | 190.00           | 52.43             | 59.74             |                   | 59.78             | 0.000607              | 1.72               | 110.48               | 26.33             | 0.15         |
| Reach 2 | 7068      | 10 YR   | 332.00           | 52.43             | 61.50             |                   | 61.56             | 0.000619              | 2.05               | 167.81               | 49.31             | 0.16         |
| Reach 2 | 7068      | 25 YR   | 436.00           | 52.43             | 62.11             |                   | 62.19             | 0.000680              | 2.31               | 228.46               | 258.79            | 0.17         |
| Reach 2 | 7068      | 50 YR   | 527.00           | 52.43             | 62.50             |                   | 62.56             | 0.000573              | 2.21               | 338.03               | 300.09            | 0.15         |

# FORK SWAMP UT3: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 7068      | 100 YR  | 623.00           | 52.43             | 62.81             |                   | 62.86             | 0.000493              | 2.12               | 432.12               | 307.92            | 0.14         |
| Reach 2 | 7210      | 2 YR    | 190.00           | 52.66             | 59.83             | 55.52             | 59.87             | 0.000550              | 1.64               | 116.02               | 28.45             | 0.14         |
| Reach 2 | 7210      | 10 YR   | 332.00           | 52.66             | 61.59             | 56.41             | 61.65             | 0.000529              | 1.92               | 190.78               | 78.98             | 0.15         |
| Reach 2 | 7210      | 25 YR   | 436.00           | 52.66             | 62.22             | 56.93             | 62.28             | 0.000522              | 2.05               | 307.40               | 325.94            | 0.15         |
| Reach 2 | 7210      | 50 YR   | 527.00           | 52.66             | 62.59             | 57.34             | 62.64             | 0.000439              | 1.96               | 433.76               | 353.05            | 0.14         |
| Reach 2 | 7210      | 100 YR  | 623.00           | 52.66             | 62.89             | 57.72             | 62.93             | 0.000378              | 1.87               | 541.44               | 373.26            | 0.13         |
| Reach 2 | 7287      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 7363      | 2 YR    | 190.00           | 54.55             | 60.38             | 56.87             | 60.44             | 0.000832              | 1.92               | 98.96                | 26.25             | 0.17         |
| Reach 2 | 7363      | 10 YR   | 332.00           | 54.55             | 62.25             | 57.69             | 62.32             | 0.000651              | 2.11               | 186.48               | 112.24            | 0.16         |
| Reach 2 | 7363      | 25 YR   | 436.00           | 54.55             | 62.60             | 58.18             | 62.69             | 0.000842              | 2.51               | 229.62               | 132.22            | 0.19         |
| Reach 2 | 7363      | 50 YR   | 527.00           | 54.55             | 62.80             | 58.56             | 62.92             | 0.001041              | 2.86               | 257.33               | 146.83            | 0.21         |
| Reach 2 | 7363      | 100 YR  | 623.00           | 54.55             | 62.99             | 58.92             | 63.13             | 0.001242              | 3.19               | 286.39               | 167.90            | 0.23         |
| Reach 2 | 7530      | 2 YR    | 190.00           | 54.56             | 60.52             |                   | 60.57             | 0.000713              | 1.79               | 105.99               | 28.11             | 0.16         |
| Reach 2 | 7530      | 10 YR   | 332.00           | 54.56             | 62.37             |                   | 62.42             | 0.000484              | 1.83               | 248.25               | 171.00            | 0.14         |
| Reach 2 | 7530      | 25 YR   | 436.00           | 54.56             | 62.77             |                   | 62.82             | 0.000527              | 2.01               | 319.22               | 205.21            | 0.15         |
| Reach 2 | 7530      | 50 YR   | 527.00           | 54.56             | 63.01             |                   | 63.06             | 0.000574              | 2.16               | 375.70               | 260.96            | 0.16         |
| Reach 2 | 7530      | 100 YR  | 623.00           | 54.56             | 63.23             |                   | 63.29             | 0.000603              | 2.27               | 439.39               | 304.67            | 0.16         |
| Reach 2 | 7641      | 2 YR    | 190.00           | 55.18             | 60.60             | 57.48             | 60.66             | 0.000962              | 1.97               | 96.40                | 28.26             | 0.19         |
| Reach 2 | 7641      | 10 YR   | 332.00           | 55.18             | 62.43             | 58.26             | 62.49             | 0.000677              | 2.01               | 224.45               | 232.24            | 0.17         |
| Reach 2 | 7641      | 25 YR   | 436.00           | 55.18             | 62.83             | 58.73             | 62.88             | 0.000641              | 2.06               | 326.26               | 266.09            | 0.16         |
| Reach 2 | 7641      | 50 YR   | 527.00           | 55.18             | 63.08             | 59.09             | 63.13             | 0.000635              | 2.12               | 395.00               | 280.10            | 0.16         |
| Reach 2 | 7641      | 100 YR  | 623.00           | 55.18             | 63.31             | 59.44             | 63.36             | 0.000628              | 2.17               | 461.19               | 292.97            | 0.16         |
| Reach 2 | 7694      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 7753      | 2 YR    | 190.00           | 55.77             | 61.26             | 57.72             | 61.30             | 0.000578              | 1.61               | 118.26               | 32.54             | 0.15         |
| Reach 2 | 7753      | 10 YR   | 332.00           | 55.77             | 63.13             | 58.44             | 63.17             | 0.000396              | 1.64               | 272.18               | 183.94            | 0.13         |
| Reach 2 | 7753      | 25 YR   | 436.00           | 55.77             | 63.36             | 58.87             | 63.42             | 0.000548              | 1.99               | 320.79               | 234.05            | 0.15         |
| Reach 2 | 7753      | 50 YR   | 527.00           | 55.77             | 63.51             | 59.21             | 63.58             | 0.000691              | 2.27               | 356.11               | 256.50            | 0.17         |
| Reach 2 | 7753      | 100 YR  | 623.00           | 55.77             | 63.62             | 59.53             | 63.71             | 0.000856              | 2.56               | 386.43               | 280.59            | 0.19         |
| Reach 2 | 7901      | 2 YR    | 168.00           | 54.62             | 61.35             |                   | 61.38             | 0.000469              | 1.51               | 123.95               | 74.75             | 0.13         |
| Reach 2 | 7901      | 10 YR   | 282.00           | 54.62             | 63.20             |                   | 63.22             | 0.000177              | 1.11               | 503.08               | 340.74            | 0.08         |



# FORK SWAMP UT3: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 7901      | 25 YR   | 369.00           | 54.62             | 63.47             |                   | 63.48             | 0.000209              | 1.24               | 596.30               | 365.57            | 0.09         |
| Reach 2 | 7901      | 50 YR   | 443.00           | 54.62             | 63.64             |                   | 63.65             | 0.000237              | 1.35               | 658.95               | 370.92            | 0.10         |
| Reach 2 | 7901      | 100 YR  | 519.00           | 54.62             | 63.78             |                   | 63.80             | 0.000266              | 1.45               | 712.19               | 375.40            | 0.10         |
| Reach 2 | 8186      | 2 YR    | 168.00           | 56.86             | 61.51             | 58.68             | 61.56             | 0.000810              | 1.73               | 97.32                | 31.44             | 0.17         |
| Reach 2 | 8186      | 10 YR   | 282.00           | 56.86             | 63.27             | 59.28             | 63.32             | 0.000596              | 1.77               | 159.23               | 53.21             | 0.15         |
| Reach 2 | 8186      | 25 YR   | 369.00           | 56.86             | 63.54             | 59.65             | 63.61             | 0.000824              | 2.14               | 178.43               | 78.61             | 0.18         |
| Reach 2 | 8186      | 50 YR   | 443.00           | 56.86             | 63.72             | 59.94             | 63.81             | 0.001016              | 2.43               | 195.86               | 135.81            | 0.20         |
| Reach 2 | 8186      | 100 YR  | 519.00           | 56.86             | 63.88             | 60.21             | 63.98             | 0.001158              | 2.64               | 223.50               | 225.16            | 0.22         |
| Reach 2 | 8238      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 8296      | 2 YR    | 168.00           | 57.00             | 62.31             | 58.94             | 62.34             | 0.000495              | 1.40               | 119.83               | 36.94             | 0.14         |
| Reach 2 | 8296      | 10 YR   | 282.00           | 57.00             | 64.15             | 59.54             | 64.18             | 0.000305              | 1.37               | 251.04               | 288.06            | 0.11         |
| Reach 2 | 8296      | 25 YR   | 369.00           | 57.00             | 64.31             | 59.93             | 64.34             | 0.000410              | 1.62               | 297.28               | 315.27            | 0.13         |
| Reach 2 | 8296      | 50 YR   | 443.00           | 57.00             | 64.39             | 60.21             | 64.44             | 0.000509              | 1.82               | 323.93               | 318.48            | 0.15         |
| Reach 2 | 8296      | 100 YR  | 519.00           | 57.00             | 64.51             | 60.48             | 64.56             | 0.000567              | 1.96               | 361.12               | 322.90            | 0.16         |
| Reach 2 | 8514      | 2 YR    | 111.00           | 55.88             | 62.36             |                   | 62.37             | 0.000025              | 0.34               | 211.63               | 103.95            | 0.03         |
| Reach 2 | 8514      | 10 YR   | 177.00           | 55.88             | 64.19             |                   | 64.20             | 0.000006              | 0.19               | 480.88               | 260.00            | 0.01         |
| Reach 2 | 8514      | 25 YR   | 230.00           | 55.88             | 64.36             |                   | 64.36             | 0.000008              | 0.22               | 523.86               | 264.51            | 0.02         |
| Reach 2 | 8514      | 50 YR   | 273.00           | 55.88             | 64.45             |                   | 64.46             | 0.000009              | 0.25               | 549.27               | 266.29            | 0.02         |
| Reach 2 | 8514      | 100 YR  | 316.00           | 55.88             | 64.57             |                   | 64.58             | 0.000011              | 0.27               | 582.17               | 268.58            | 0.02         |
| Reach 2 | 8701      | 2 YR    | 111.00           | 57.57             | 62.37             | 59.02             | 62.38             | 0.000313              | 1.09               | 102.03               | 32.28             | 0.11         |
| Reach 2 | 8701      | 10 YR   | 177.00           | 57.57             | 64.19             | 59.44             | 64.21             | 0.000204              | 1.05               | 168.93               | 50.98             | 0.09         |
| Reach 2 | 8701      | 25 YR   | 230.00           | 57.57             | 64.35             | 59.73             | 64.38             | 0.000306              | 1.30               | 178.27               | 65.04             | 0.11         |
| Reach 2 | 8701      | 50 YR   | 273.00           | 57.57             | 64.44             | 59.94             | 64.48             | 0.000400              | 1.50               | 184.73               | 73.19             | 0.13         |
| Reach 2 | 8701      | 100 YR  | 316.00           | 57.57             | 64.56             | 60.14             | 64.61             | 0.000480              | 1.66               | 194.21               | 84.30             | 0.14         |
| Reach 2 | 8790      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 8863      | 2 YR    | 111.00           | 58.65             | 62.68             | 59.87             | 62.70             | 0.000328              | 1.09               | 102.20               | 33.77             | 0.11         |
| Reach 2 | 8863      | 10 YR   | 177.00           | 58.65             | 64.82             | 60.20             | 64.83             | 0.000160              | 0.97               | 184.59               | 58.74             | 0.08         |
| Reach 2 | 8863      | 25 YR   | 230.00           | 58.65             | 65.08             | 60.43             | 65.10             | 0.000219              | 1.16               | 202.36               | 76.60             | 0.10         |
| Reach 2 | 8863      | 50 YR   | 273.00           | 58.65             | 65.24             | 60.60             | 65.27             | 0.000265              | 1.29               | 216.04               | 87.91             | 0.10         |
| Reach 2 | 8863      | 100 YR  | 316.00           | 58.65             | 65.39             | 60.77             | 65.42             | 0.000307              | 1.41               | 229.46               | 97.74             | 0.11         |

# FORK SWAMP UT3: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 9043      | 2 YR    | 65.00            | 57.96             | 62.74             |                   | 62.76             | 0.000316              | 1.01               | 64.67                | 22.43             | 0.10         |
| Reach 2 | 9043      | 10 YR   | 115.00           | 57.96             | 64.85             |                   | 64.86             | 0.000188              | 0.97               | 119.07               | 29.25             | 0.08         |
| Reach 2 | 9043      | 25 YR   | 150.00           | 57.96             | 65.12             |                   | 65.14             | 0.000268              | 1.18               | 127.20               | 30.14             | 0.10         |
| Reach 2 | 9043      | 50 YR   | 181.00           | 57.96             | 65.30             |                   | 65.33             | 0.000350              | 1.37               | 132.54               | 30.71             | 0.12         |
| Reach 2 | 9043      | 100 YR  | 213.00           | 57.96             | 65.45             |                   | 65.49             | 0.000441              | 1.55               | 137.28               | 31.20             | 0.13         |
| Reach 2 | 9621      | 2 YR    | 65.00            | 59.00             | 62.76             |                   | 62.76             | 0.000001              | 0.09               | 1251.10              | 367.42            | 0.01         |
| Reach 2 | 9621      | 10 YR   | 115.00           | 59.00             | 64.86             |                   | 64.86             | 0.000001              | 0.09               | 2064.69              | 406.35            | 0.01         |
| Reach 2 | 9621      | 25 YR   | 150.00           | 59.00             | 65.15             |                   | 65.15             | 0.000001              | 0.12               | 2180.25              | 411.58            | 0.01         |
| Reach 2 | 9621      | 50 YR   | 181.00           | 59.00             | 65.33             |                   | 65.33             | 0.000002              | 0.14               | 2256.47              | 415.00            | 0.01         |
| Reach 2 | 9621      | 100 YR  | 213.00           | 59.00             | 65.49             |                   | 65.49             | 0.000002              | 0.16               | 2324.42              | 418.02            | 0.01         |
| Reach 2 | 9935      | 2 YR    | 65.00            | 59.79             | 62.71             |                   | 62.79             | 0.002637              | 2.20               | 29.53                | 15.64             | 0.28         |
| Reach 2 | 9935      | 10 YR   | 115.00           | 59.79             | 64.84             |                   | 64.88             | 0.000779              | 1.65               | 69.85                | 22.30             | 0.16         |
| Reach 2 | 9935      | 25 YR   | 150.00           | 59.79             | 65.11             |                   | 65.17             | 0.001056              | 1.97               | 75.99                | 23.15             | 0.19         |
| Reach 2 | 9935      | 50 YR   | 181.00           | 59.79             | 65.28             |                   | 65.36             | 0.001337              | 2.26               | 80.01                | 23.69             | 0.22         |
| Reach 2 | 9935      | 100 YR  | 213.00           | 59.79             | 65.43             |                   | 65.53             | 0.001646              | 2.55               | 83.57                | 24.15             | 0.24         |
| Reach 2 | 10250     | 2 YR    | 65.00            | 58.71             | 63.21             |                   | 63.24             | 0.000903              | 1.52               | 42.75                | 16.86             | 0.17         |
| Reach 2 | 10250     | 10 YR   | 115.00           | 58.71             | 65.05             |                   | 65.08             | 0.000545              | 1.46               | 78.66                | 22.14             | 0.14         |
| Reach 2 | 10250     | 25 YR   | 150.00           | 58.71             | 65.39             |                   | 65.44             | 0.000719              | 1.74               | 86.44                | 23.12             | 0.16         |
| Reach 2 | 10250     | 50 YR   | 181.00           | 58.71             | 65.64             |                   | 65.70             | 0.000881              | 1.96               | 92.18                | 23.82             | 0.18         |
| Reach 2 | 10250     | 100 YR  | 213.00           | 58.71             | 65.86             |                   | 65.94             | 0.001046              | 2.18               | 97.65                | 24.47             | 0.19         |
| Reach 2 | 10351     | 2 YR    | 65.00            | 59.76             | 63.29             | 60.96             | 63.31             | 0.000491              | 1.14               | 56.83                | 23.20             | 0.13         |
| Reach 2 | 10351     | 10 YR   | 115.00           | 59.76             | 65.11             | 61.37             | 65.13             | 0.000284              | 1.10               | 104.84               | 29.76             | 0.10         |
| Reach 2 | 10351     | 25 YR   | 150.00           | 59.76             | 65.47             | 61.60             | 65.50             | 0.000367              | 1.29               | 115.90               | 31.07             | 0.12         |
| Reach 2 | 10351     | 50 YR   | 181.00           | 59.76             | 65.73             | 61.80             | 65.77             | 0.000443              | 1.46               | 124.21               | 32.02             | 0.13         |
| Reach 2 | 10351     | 100 YR  | 213.00           | 59.76             | 65.98             | 61.99             | 66.02             | 0.000517              | 1.61               | 132.21               | 34.75             | 0.14         |
| Reach 2 | 10420     |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 10507     | 2 YR    | 65.00            | 59.70             | 63.42             | 61.54             | 63.47             | 0.001475              | 1.76               | 36.90                | 17.55             | 0.21         |
| Reach 2 | 10507     | 10 YR   | 115.00           | 59.70             | 65.62             | 62.10             | 65.65             | 0.000453              | 1.36               | 86.67                | 75.01             | 0.13         |
| Reach 2 | 10507     | 25 YR   | 150.00           | 59.70             | 66.20             | 62.40             | 66.21             | 0.000255              | 1.10               | 168.27               | 139.92            | 0.10         |
| Reach 2 | 10507     | 50 YR   | 181.00           | 59.70             | 66.51             | 62.65             | 66.52             | 0.000172              | 0.94               | 216.88               | 163.33            | 0.08         |
| Reach 2 | 10507     | 100 YR  | 213.00           | 59.70             | 66.75             | 62.87             | 66.76             | 0.000129              | 0.84               | 256.91               | 164.71            | 0.07         |

# FORK SWAMP UT3: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 10695     | 2 YR    | 65.00            | 60.49             | 63.64             |                   | 63.66             | 0.000742              | 1.35               | 48.18                | 20.55             | 0.16         |
| Reach 2 | 10695     | 10 YR   | 115.00           | 60.49             | 65.70             |                   | 65.72             | 0.000332              | 1.18               | 97.62                | 27.32             | 0.11         |
| Reach 2 | 10695     | 25 YR   | 150.00           | 60.49             | 66.25             |                   | 66.28             | 0.000378              | 1.33               | 113.12               | 29.12             | 0.12         |
| Reach 2 | 10695     | 50 YR   | 181.00           | 60.49             | 66.54             |                   | 66.58             | 0.000450              | 1.49               | 121.79               | 30.07             | 0.13         |
| Reach 2 | 10695     | 100 YR  | 213.00           | 60.49             | 66.78             |                   | 66.82             | 0.000535              | 1.65               | 128.91               | 30.84             | 0.14         |
| Reach 2 | 11090     | 2 YR    | 65.00            | 60.95             | 64.01             |                   | 64.06             | 0.001361              | 1.68               | 38.70                | 19.05             | 0.21         |
| Reach 2 | 11090     | 10 YR   | 115.00           | 60.95             | 65.86             |                   | 65.90             | 0.000576              | 1.43               | 80.36                | 25.96             | 0.14         |
| Reach 2 | 11090     | 25 YR   | 150.00           | 60.95             | 66.43             |                   | 66.47             | 0.000611              | 1.57               | 95.66                | 28.08             | 0.15         |
| Reach 2 | 11090     | 50 YR   | 181.00           | 60.95             | 66.75             |                   | 66.80             | 0.000693              | 1.72               | 104.93               | 29.28             | 0.16         |
| Reach 2 | 11090     | 100 YR  | 213.00           | 60.95             | 67.02             |                   | 67.08             | 0.000787              | 1.89               | 112.94               | 30.29             | 0.17         |
| Reach 2 | 11509     | 2 YR    | 65.00            | 61.70             | 64.76             |                   | 64.84             | 0.002636              | 2.20               | 29.58                | 15.74             | 0.28         |
| Reach 2 | 11509     | 10 YR   | 115.00           | 61.70             | 66.20             |                   | 66.27             | 0.001464              | 2.05               | 56.07                | 21.01             | 0.22         |
| Reach 2 | 11509     | 25 YR   | 150.00           | 61.70             | 66.78             |                   | 66.85             | 0.001438              | 2.18               | 68.78                | 23.12             | 0.22         |
| Reach 2 | 11509     | 50 YR   | 181.00           | 61.70             | 67.14             |                   | 67.23             | 0.001528              | 2.34               | 77.35                | 24.44             | 0.23         |
| Reach 2 | 11509     | 100 YR  | 213.00           | 61.70             | 67.45             |                   | 67.55             | 0.001636              | 2.50               | 85.15                | 25.58             | 0.24         |
| Reach 2 | 11906     | 2 YR    | 65.00            | 63.69             | 67.95             | 67.95             | 68.86             | 0.080837              | 7.67               | 8.48                 | 4.68              | 1.00         |
| Reach 2 | 11906     | 10 YR   | 115.00           | 63.69             | 68.89             | 68.89             | 70.01             | 0.070692              | 8.48               | 13.56                | 6.12              | 1.00         |
| Reach 2 | 11906     | 25 YR   | 150.00           | 63.69             | 69.40             | 69.40             | 70.63             | 0.065871              | 8.87               | 16.92                | 6.91              | 1.00         |
| Reach 2 | 11906     | 50 YR   | 181.00           | 63.69             | 70.39             | 70.39             | 70.53             | 0.009687              | 4.03               | 148.78               | 378.01            | 0.40         |
| Reach 2 | 11906     | 100 YR  | 213.00           | 63.69             | 70.35             | 70.35             | 70.62             | 0.016810              | 5.26               | 134.84               | 372.18            | 0.53         |
| Reach 2 | 12134     | 2 YR    | 65.00            | 68.81             | 71.31             |                   | 71.41             | 0.004047              | 2.65               | 38.70                | 62.73             | 0.35         |
| Reach 2 | 12134     | 10 YR   | 115.00           | 68.81             | 71.68             | 71.00             | 71.73             | 0.002519              | 2.37               | 105.29               | 279.53            | 0.29         |
| Reach 2 | 12134     | 25 YR   | 150.00           | 68.81             | 71.84             |                   | 71.87             | 0.001669              | 2.03               | 154.58               | 327.30            | 0.24         |
| Reach 2 | 12134     | 50 YR   | 181.00           | 68.81             | 71.77             |                   | 71.84             | 0.003771              | 2.98               | 130.90               | 323.21            | 0.35         |
| Reach 2 | 12134     | 100 YR  | 213.00           | 68.81             | 71.87             | 71.71             | 71.92             | 0.002802              | 2.65               | 165.16               | 329.12            | 0.31         |
| Reach 1 | 36        | 2 YR    | 152.00           | 51.73             | 59.50             |                   | 59.53             | 0.000316              | 1.29               | 129.95               | 91.31             | 0.11         |
| Reach 1 | 36        | 10 YR   | 306.00           | 51.73             | 61.26             |                   | 61.29             | 0.000318              | 1.46               | 376.43               | 185.35            | 0.11         |
| Reach 1 | 36        | 25 YR   | 419.00           | 51.73             | 61.85             |                   | 61.88             | 0.000361              | 1.64               | 492.45               | 208.40            | 0.12         |
| Reach 1 | 36        | 50 YR   | 519.00           | 51.73             | 62.23             |                   | 62.26             | 0.000415              | 1.81               | 582.32               | 278.58            | 0.13         |
| Reach 1 | 36        | 100 YR  | 632.00           | 51.73             | 62.53             |                   | 62.58             | 0.000465              | 1.98               | 671.35               | 299.15            | 0.14         |
| Reach 1 | 219       | 2 YR    | 152.00           | 53.60             | 59.57             | 55.76             | 59.60             | 0.000471              | 1.42               | 107.30               | 30.03             | 0.13         |
| Reach 1 | 219       | 10 YR   | 306.00           | 53.60             | 61.33             | 56.71             | 61.38             | 0.000573              | 1.81               | 180.37               | 57.69             | 0.15         |

# FORK SWAMP UT3: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 219       | 25 YR   | 419.00           | 53.60             | 61.92             | 57.24             | 61.99             | 0.000733              | 2.14               | 218.09               | 68.71             | 0.17         |
| Reach 1 | 219       | 50 YR   | 519.00           | 53.60             | 62.31             | 57.66             | 62.39             | 0.000882              | 2.41               | 270.89               | 175.51            | 0.19         |
| Reach 1 | 219       | 100 YR  | 632.00           | 53.60             | 62.63             | 58.07             | 62.73             | 0.001003              | 2.66               | 328.60               | 187.63            | 0.20         |
| Reach 1 | 289       |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 367       | 2 YR    | 152.00           | 54.13             | 59.58             | 56.17             | 59.62             | 0.000482              | 1.41               | 108.02               | 31.87             | 0.13         |
| Reach 1 | 367       | 10 YR   | 306.00           | 54.13             | 61.43             | 57.00             | 61.48             | 0.000538              | 1.76               | 173.79               | 39.47             | 0.15         |
| Reach 1 | 367       | 25 YR   | 419.00           | 54.13             | 62.12             | 57.49             | 62.19             | 0.000671              | 2.07               | 202.14               | 95.89             | 0.17         |
| Reach 1 | 367       | 50 YR   | 519.00           | 54.13             | 62.55             | 57.86             | 62.64             | 0.000812              | 2.35               | 222.21               | 150.91            | 0.19         |
| Reach 1 | 367       | 100 YR  | 632.00           | 54.13             | 62.89             | 58.24             | 63.00             | 0.000978              | 2.66               | 248.94               | 170.80            | 0.20         |
| Reach 1 | 468       | 2 YR    | 152.00           | 54.53             | 59.64             |                   | 59.68             | 0.000759              | 1.71               | 88.63                | 26.22             | 0.16         |
| Reach 1 | 468       | 10 YR   | 306.00           | 54.53             | 61.48             |                   | 61.56             | 0.000847              | 2.14               | 142.90               | 32.55             | 0.18         |
| Reach 1 | 468       | 25 YR   | 419.00           | 54.53             | 62.19             |                   | 62.29             | 0.001049              | 2.51               | 166.71               | 34.97             | 0.20         |
| Reach 1 | 468       | 50 YR   | 519.00           | 54.53             | 62.63             |                   | 62.76             | 0.001262              | 2.84               | 182.52               | 36.49             | 0.22         |
| Reach 1 | 468       | 100 YR  | 632.00           | 54.53             | 62.99             |                   | 63.15             | 0.001552              | 3.23               | 195.74               | 37.71             | 0.25         |
| Reach 1 | 981       | 2 YR    | 145.00           | 54.12             | 59.96             |                   | 59.99             | 0.000469              | 1.44               | 101.02               | 27.16             | 0.13         |
| Reach 1 | 981       | 10 YR   | 292.00           | 54.12             | 61.86             |                   | 61.91             | 0.000563              | 1.84               | 158.46               | 33.25             | 0.15         |
| Reach 1 | 981       | 25 YR   | 400.00           | 54.12             | 62.65             |                   | 62.72             | 0.000688              | 2.15               | 185.90               | 35.79             | 0.17         |
| Reach 1 | 981       | 50 YR   | 497.00           | 54.12             | 63.19             |                   | 63.28             | 0.000812              | 2.42               | 205.44               | 37.50             | 0.18         |
| Reach 1 | 981       | 100 YR  | 604.00           | 54.12             | 63.66             |                   | 63.77             | 0.000955              | 2.70               | 223.62               | 39.02             | 0.20         |
| Reach 1 | 1414      | 2 YR    | 145.00           | 55.23             | 60.21             |                   | 60.26             | 0.000849              | 1.81               | 80.27                | 23.59             | 0.17         |
| Reach 1 | 1414      | 10 YR   | 292.00           | 55.23             | 62.15             |                   | 62.22             | 0.000905              | 2.22               | 131.44               | 29.30             | 0.18         |
| Reach 1 | 1414      | 25 YR   | 400.00           | 55.23             | 62.99             |                   | 63.10             | 0.001046              | 2.54               | 157.41               | 31.81             | 0.20         |
| Reach 1 | 1414      | 50 YR   | 497.00           | 55.23             | 63.58             |                   | 63.71             | 0.001185              | 2.81               | 176.64               | 33.54             | 0.22         |
| Reach 1 | 1414      | 100 YR  | 604.00           | 55.23             | 64.12             |                   | 64.27             | 0.001340              | 3.10               | 195.11               | 35.13             | 0.23         |
| Reach 1 | 1933      | 2 YR    | 145.00           | 55.85             | 60.65             |                   | 60.70             | 0.000836              | 1.72               | 84.36                | 27.64             | 0.17         |
| Reach 1 | 1933      | 10 YR   | 292.00           | 55.85             | 62.60             |                   | 62.66             | 0.000775              | 2.00               | 145.89               | 35.69             | 0.17         |
| Reach 1 | 1933      | 25 YR   | 400.00           | 55.85             | 63.50             |                   | 63.58             | 0.000828              | 2.22               | 179.97               | 39.45             | 0.18         |
| Reach 1 | 1933      | 50 YR   | 497.00           | 55.85             | 64.15             |                   | 64.24             | 0.000886              | 2.41               | 206.34               | 42.13             | 0.19         |
| Reach 1 | 1933      | 100 YR  | 604.00           | 55.85             | 64.75             |                   | 64.86             | 0.000951              | 2.60               | 232.50               | 44.63             | 0.20         |
| Reach 1 | 2409      | 2 YR    | 145.00           | 55.66             | 61.06             |                   | 61.11             | 0.000889              | 1.87               | 77.36                | 21.82             | 0.18         |
| Reach 1 | 2409      | 10 YR   | 292.00           | 55.66             | 63.00             |                   | 63.08             | 0.000996              | 2.35               | 124.42               | 26.73             | 0.19         |

# FORK SWAMP UT3: FUTURE CONDITIONS

HEC-RAS Plan: Fut\_Base (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 2409      | 25 YR   | 400.00           | 55.66             | 63.93             |                   | 64.04             | 0.001115              | 2.66               | 150.78               | 36.33             | 0.21         |
| Reach 1 | 2409      | 50 YR   | 497.00           | 55.66             | 64.60             |                   | 64.73             | 0.001172              | 2.89               | 185.79               | 59.67             | 0.21         |
| Reach 1 | 2409      | 100 YR  | 604.00           | 55.66             | 65.23             |                   | 65.38             | 0.001220              | 3.10               | 226.83               | 70.51             | 0.22         |
| Reach 1 | 2917      | 2 YR    | 112.00           | 56.19             | 61.39             |                   | 61.41             | 0.000370              | 1.21               | 92.76                | 27.52             | 0.12         |
| Reach 1 | 2917      | 10 YR   | 217.00           | 56.19             | 63.36             |                   | 63.39             | 0.000350              | 1.42               | 153.28               | 33.87             | 0.12         |
| Reach 1 | 2917      | 25 YR   | 294.00           | 56.19             | 64.34             |                   | 64.38             | 0.000365              | 1.56               | 188.18               | 38.57             | 0.12         |
| Reach 1 | 2917      | 50 YR   | 362.00           | 56.19             | 65.04             |                   | 65.08             | 0.000374              | 1.69               | 218.71               | 49.07             | 0.13         |
| Reach 1 | 2917      | 100 YR  | 438.00           | 56.19             | 65.69             |                   | 65.74             | 0.000389              | 1.82               | 254.10               | 58.61             | 0.13         |
| Reach 1 | 3438      | 2 YR    | 112.00           | 55.93             | 61.47             |                   | 61.47             | 0.000059              | 0.56               | 200.94               | 50.80             | 0.05         |
| Reach 1 | 3438      | 10 YR   | 217.00           | 55.93             | 63.45             |                   | 63.46             | 0.000065              | 0.70               | 310.21               | 59.49             | 0.05         |
| Reach 1 | 3438      | 25 YR   | 294.00           | 55.93             | 64.44             |                   | 64.45             | 0.000070              | 0.79               | 382.06               | 85.57             | 0.06         |
| Reach 1 | 3438      | 50 YR   | 362.00           | 55.93             | 65.15             |                   | 65.16             | 0.000074              | 0.86               | 444.50               | 91.75             | 0.06         |
| Reach 1 | 3438      | 100 YR  | 438.00           | 55.93             | 65.81             |                   | 65.83             | 0.000079              | 0.94               | 507.53               | 97.80             | 0.06         |
| Reach 1 | 3919      | 2 YR    | 112.00           | 56.65             | 61.52             |                   | 61.55             | 0.000700              | 1.53               | 73.15                | 24.47             | 0.16         |
| Reach 1 | 3919      | 10 YR   | 217.00           | 56.65             | 63.50             |                   | 63.54             | 0.000571              | 1.68               | 128.82               | 31.77             | 0.15         |
| Reach 1 | 3919      | 25 YR   | 294.00           | 56.65             | 64.49             |                   | 64.54             | 0.000566              | 1.81               | 162.12               | 35.42             | 0.15         |
| Reach 1 | 3919      | 50 YR   | 362.00           | 56.65             | 65.19             |                   | 65.25             | 0.000552              | 1.93               | 188.36               | 39.21             | 0.15         |
| Reach 1 | 3919      | 100 YR  | 438.00           | 56.65             | 65.86             |                   | 65.92             | 0.000553              | 2.06               | 215.65               | 42.89             | 0.15         |
| Reach 1 | 4360      | 2 YR    | 112.00           | 56.95             | 61.88             |                   | 61.93             | 0.001046              | 1.87               | 60.05                | 19.26             | 0.19         |
| Reach 1 | 4360      | 10 YR   | 217.00           | 56.95             | 63.80             |                   | 63.87             | 0.000944              | 2.13               | 102.11               | 24.57             | 0.18         |
| Reach 1 | 4360      | 25 YR   | 294.00           | 56.95             | 64.78             |                   | 64.87             | 0.000953              | 2.30               | 127.71               | 27.30             | 0.19         |
| Reach 1 | 4360      | 50 YR   | 362.00           | 56.95             | 65.48             |                   | 65.58             | 0.000984              | 2.45               | 147.51               | 29.24             | 0.19         |
| Reach 1 | 4360      | 100 YR  | 438.00           | 56.95             | 66.15             |                   | 66.25             | 0.000996              | 2.61               | 174.73               | 57.43             | 0.20         |

**PRIMARY SYSTEM  
ALTERNATIVE:  
HEC-RAS OUTPUT**

# FORK SWAMP MAIN BRANCH: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp Reach: Upper Reach

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 40427.0   | 2-YEAR   | 1109.00          | 39.01             | 46.79             | 43.61             | 47.18             | 0.003705              | 5.03               | 326.57               | 391.56            | 0.36         |
| Upper Reach | 40427.0   | 10-YEAR  | 2151.00          | 39.01             | 48.46             | 45.55             | 48.88             | 0.003705              | 5.93               | 1653.37              | 1010.42           | 0.38         |
| Upper Reach | 40427.0   | 25-YEAR  | 2915.00          | 39.01             | 49.23             | 47.91             | 49.64             | 0.003705              | 6.32               | 2580.07              | 1529.96           | 0.38         |
| Upper Reach | 40427.0   | 50-YEAR  | 3586.00          | 39.01             | 49.73             | 48.35             | 50.13             | 0.003701              | 6.57               | 3382.70              | 1670.55           | 0.39         |
| Upper Reach | 40427.0   | 100-YEAR | 4331.00          | 39.01             | 50.18             | 48.82             | 50.57             | 0.003703              | 6.79               | 4157.80              | 1742.32           | 0.39         |
| Upper Reach | 41233.0   | 2-YEAR   | 1109.00          | 39.95             | 48.53             | 46.04             | 48.57             | 0.000956              | 2.65               | 2257.53              | 1599.40           | 0.19         |
| Upper Reach | 41233.0   | 10-YEAR  | 2151.00          | 39.95             | 49.88             | 48.00             | 49.90             | 0.000592              | 2.38               | 4546.44              | 1900.69           | 0.15         |
| Upper Reach | 41233.0   | 25-YEAR  | 2915.00          | 39.95             | 50.57             | 48.26             | 50.59             | 0.000544              | 2.42               | 5771.52              | 1995.11           | 0.15         |
| Upper Reach | 41233.0   | 50-YEAR  | 3586.00          | 39.95             | 51.06             | 48.47             | 51.08             | 0.000543              | 2.51               | 6638.86              | 2034.06           | 0.15         |
| Upper Reach | 41233.0   | 100-YEAR | 4331.00          | 39.95             | 51.52             | 48.64             | 51.54             | 0.000557              | 2.64               | 7459.52              | 2070.48           | 0.15         |
| Upper Reach | 41704.5   | 2-YEAR   | 1109.00          | 40.50             | 48.80             |                   | 48.82             | 0.000314              | 1.60               | 1841.55              | 831.66            | 0.11         |
| Upper Reach | 41704.5   | 10-YEAR  | 2151.00          | 40.50             | 50.11             |                   | 50.13             | 0.000416              | 2.09               | 3282.88              | 1297.30           | 0.13         |
| Upper Reach | 41704.5   | 25-YEAR  | 2915.00          | 40.50             | 50.81             |                   | 50.83             | 0.000450              | 2.30               | 4211.75              | 1375.24           | 0.14         |
| Upper Reach | 41704.5   | 50-YEAR  | 3586.00          | 40.50             | 51.30             |                   | 51.32             | 0.000480              | 2.47               | 4901.56              | 1431.29           | 0.15         |
| Upper Reach | 41704.5   | 100-YEAR | 4331.00          | 40.50             | 51.77             |                   | 51.79             | 0.000518              | 2.65               | 5589.35              | 1503.73           | 0.15         |
| Upper Reach | 42742.0   | 2-YEAR   | 1097.00          | 40.98             | 49.03             |                   | 49.04             | 0.000155              | 1.11               | 2193.14              | 822.25            | 0.08         |
| Upper Reach | 42742.0   | 10-YEAR  | 2129.00          | 40.98             | 50.43             |                   | 50.44             | 0.000227              | 1.53               | 3536.92              | 1050.77           | 0.10         |
| Upper Reach | 42742.0   | 25-YEAR  | 2886.00          | 40.98             | 51.17             |                   | 51.18             | 0.000268              | 1.76               | 4326.07              | 1089.81           | 0.11         |
| Upper Reach | 42742.0   | 50-YEAR  | 3549.00          | 40.98             | 51.70             |                   | 51.71             | 0.000302              | 1.94               | 4907.85              | 1113.92           | 0.11         |
| Upper Reach | 42742.0   | 100-YEAR | 4285.00          | 40.98             | 52.20             |                   | 52.22             | 0.000338              | 2.13               | 5477.96              | 1137.05           | 0.12         |
| Upper Reach | 43230.0   | 2-YEAR   | 1097.00          | 41.20             | 49.11             |                   | 49.11             | 0.000147              | 1.06               | 2592.50              | 1213.67           | 0.08         |
| Upper Reach | 43230.0   | 10-YEAR  | 2129.00          | 41.20             | 50.54             |                   | 50.54             | 0.000188              | 1.38               | 4554.39              | 1499.08           | 0.09         |
| Upper Reach | 43230.0   | 25-YEAR  | 2886.00          | 41.20             | 51.29             |                   | 51.30             | 0.000209              | 1.54               | 5712.60              | 1587.96           | 0.09         |
| Upper Reach | 43230.0   | 50-YEAR  | 3549.00          | 41.20             | 51.83             |                   | 51.84             | 0.000224              | 1.66               | 6576.00              | 1606.59           | 0.10         |
| Upper Reach | 43230.0   | 100-YEAR | 4285.00          | 41.20             | 52.35             |                   | 52.36             | 0.000241              | 1.79               | 7416.10              | 1624.53           | 0.10         |
| Upper Reach | 43829.0   | 2-YEAR   | 857.00           | 41.48             | 49.19             |                   | 49.20             | 0.000136              | 1.00               | 2397.01              | 1160.70           | 0.07         |
| Upper Reach | 43829.0   | 10-YEAR  | 1615.00          | 41.48             | 50.64             |                   | 50.64             | 0.000136              | 1.15               | 4188.87              | 1298.95           | 0.07         |
| Upper Reach | 43829.0   | 25-YEAR  | 2178.00          | 41.48             | 51.40             |                   | 51.40             | 0.000142              | 1.25               | 5192.86              | 1332.71           | 0.08         |
| Upper Reach | 43829.0   | 50-YEAR  | 2663.00          | 41.48             | 51.94             |                   | 51.95             | 0.000148              | 1.34               | 5926.32              | 1347.92           | 0.08         |
| Upper Reach | 43829.0   | 100-YEAR | 3286.00          | 41.48             | 52.47             |                   | 52.48             | 0.000165              | 1.47               | 6647.55              | 1373.35           | 0.08         |
| Upper Reach | 44420.0   | 2-YEAR   | 857.00           | 42.46             | 49.34             |                   | 49.38             | 0.000966              | 2.46               | 1639.62              | 1135.48           | 0.18         |
| Upper Reach | 44420.0   | 10-YEAR  | 1615.00          | 42.46             | 50.77             |                   | 50.78             | 0.000499              | 2.04               | 3402.58              | 1312.92           | 0.13         |
| Upper Reach | 44420.0   | 25-YEAR  | 2178.00          | 42.46             | 51.53             |                   | 51.54             | 0.000429              | 2.02               | 4427.05              | 1386.88           | 0.13         |

# FORK SWAMP MAIN BRANCH: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 44420.0   | 50-YEAR  | 2663.00          | 42.46             | 52.08             |                   | 52.09             | 0.000399              | 2.04               | 5200.02              | 1430.38           | 0.12         |
| Upper Reach | 44420.0   | 100-YEAR | 3286.00          | 42.46             | 52.62             |                   | 52.63             | 0.000400              | 2.12               | 5982.97              | 1466.81           | 0.12         |
| Upper Reach | 45322.0   | 2-YEAR   | 596.00           | 43.50             | 50.26             |                   | 50.31             | 0.001137              | 2.63               | 1219.62              | 1494.02           | 0.19         |
| Upper Reach | 45322.0   | 10-YEAR  | 1137.00          | 43.50             | 51.25             |                   | 51.26             | 0.000584              | 2.10               | 2761.95              | 1633.99           | 0.14         |
| Upper Reach | 45322.0   | 25-YEAR  | 1526.00          | 43.50             | 51.91             |                   | 51.92             | 0.000405              | 1.86               | 3858.12              | 1675.66           | 0.12         |
| Upper Reach | 45322.0   | 50-YEAR  | 1868.00          | 43.50             | 52.41             |                   | 52.42             | 0.000335              | 1.76               | 4711.78              | 1700.13           | 0.11         |
| Upper Reach | 45322.0   | 100-YEAR | 2246.00          | 43.50             | 52.93             |                   | 52.94             | 0.000287              | 1.70               | 5606.22              | 1730.60           | 0.10         |
| Upper Reach | 46097.8   | 2-YEAR   | 596.00           | 44.33             | 50.92             |                   | 50.94             | 0.000606              | 1.89               | 1471.45              | 1137.41           | 0.14         |
| Upper Reach | 46097.8   | 10-YEAR  | 1137.00          | 44.33             | 51.71             |                   | 51.73             | 0.000622              | 2.09               | 2442.95              | 1310.74           | 0.14         |
| Upper Reach | 46097.8   | 25-YEAR  | 1526.00          | 44.33             | 52.27             |                   | 52.28             | 0.000542              | 2.06               | 3185.98              | 1370.11           | 0.14         |
| Upper Reach | 46097.8   | 50-YEAR  | 1868.00          | 44.33             | 52.72             |                   | 52.73             | 0.000487              | 2.03               | 3816.60              | 1407.31           | 0.13         |
| Upper Reach | 46097.8   | 100-YEAR | 2246.00          | 44.33             | 53.20             |                   | 53.21             | 0.000436              | 2.01               | 4505.65              | 1446.86           | 0.13         |
| Upper Reach | 46863.0   | 2-YEAR   | 596.00           | 44.76             | 51.30             |                   | 51.31             | 0.000385              | 1.49               | 2045.25              | 1565.18           | 0.11         |
| Upper Reach | 46863.0   | 10-YEAR  | 1137.00          | 44.76             | 52.08             |                   | 52.09             | 0.000365              | 1.59               | 3306.87              | 1637.93           | 0.11         |
| Upper Reach | 46863.0   | 25-YEAR  | 1526.00          | 44.76             | 52.59             |                   | 52.60             | 0.000332              | 1.59               | 4151.54              | 1662.74           | 0.11         |
| Upper Reach | 46863.0   | 50-YEAR  | 1868.00          | 44.76             | 53.02             |                   | 53.03             | 0.000307              | 1.60               | 4862.61              | 1683.37           | 0.10         |
| Upper Reach | 46863.0   | 100-YEAR | 2246.00          | 44.76             | 53.47             |                   | 53.48             | 0.000282              | 1.59               | 5635.15              | 1720.84           | 0.10         |
| Upper Reach | 47656.0   | 2-YEAR   | 473.00           | 45.21             | 51.74             |                   | 51.81             | 0.001357              | 2.80               | 650.76               | 747.14            | 0.21         |
| Upper Reach | 47656.0   | 10-YEAR  | 901.00           | 45.21             | 52.51             |                   | 52.57             | 0.001366              | 3.06               | 1330.63              | 951.64            | 0.21         |
| Upper Reach | 47656.0   | 25-YEAR  | 1208.00          | 45.21             | 52.99             |                   | 53.03             | 0.001199              | 3.01               | 1789.63              | 984.30            | 0.20         |
| Upper Reach | 47656.0   | 50-YEAR  | 1478.00          | 45.21             | 53.38             |                   | 53.42             | 0.001074              | 2.96               | 2183.63              | 1013.87           | 0.19         |
| Upper Reach | 47656.0   | 100-YEAR | 1777.00          | 45.21             | 53.81             |                   | 53.84             | 0.000953              | 2.90               | 2622.19              | 1058.36           | 0.18         |
| Upper Reach | 48173.0   | 2-YEAR   | 473.00           | 45.55             | 52.11             |                   | 52.12             | 0.000326              | 1.23               | 658.04               | 457.54            | 0.11         |
| Upper Reach | 48173.0   | 10-YEAR  | 901.00           | 45.55             | 52.93             |                   | 52.95             | 0.000453              | 1.64               | 1164.59              | 670.88            | 0.13         |
| Upper Reach | 48173.0   | 25-YEAR  | 1208.00          | 45.55             | 53.40             |                   | 53.42             | 0.000499              | 1.83               | 1479.41              | 695.10            | 0.14         |
| Upper Reach | 48173.0   | 50-YEAR  | 1478.00          | 45.55             | 53.77             |                   | 53.80             | 0.000519              | 1.95               | 1745.06              | 716.42            | 0.14         |
| Upper Reach | 48173.0   | 100-YEAR | 1777.00          | 45.55             | 54.17             |                   | 54.20             | 0.000523              | 2.05               | 2035.73              | 733.92            | 0.15         |
| Upper Reach | 48793.0   | 2-YEAR   | 473.00           | 45.95             | 52.36             |                   | 52.39             | 0.000563              | 1.58               | 434.27               | 277.27            | 0.14         |
| Upper Reach | 48793.0   | 10-YEAR  | 901.00           | 45.95             | 53.29             |                   | 53.34             | 0.000849              | 2.24               | 728.52               | 359.74            | 0.18         |
| Upper Reach | 48793.0   | 25-YEAR  | 1208.00          | 45.95             | 53.79             |                   | 53.85             | 0.000979              | 2.56               | 930.45               | 427.44            | 0.19         |
| Upper Reach | 48793.0   | 50-YEAR  | 1478.00          | 45.95             | 54.19             |                   | 54.25             | 0.001044              | 2.77               | 1102.65              | 447.56            | 0.20         |
| Upper Reach | 48793.0   | 100-YEAR | 1777.00          | 45.95             | 54.59             |                   | 54.66             | 0.001085              | 2.96               | 1289.61              | 470.37            | 0.21         |



# FORK SWAMP MAIN BRANCH: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 49296     | 2-YEAR   | 464.00           | 47.66             | 52.89             |                   | 53.02             | 0.004187              | 3.84               | 205.04               | 130.22            | 0.34         |
| Upper Reach | 49296     | 10-YEAR  | 877.00           | 47.66             | 54.01             |                   | 54.13             | 0.003683              | 4.13               | 417.46               | 321.75            | 0.33         |
| Upper Reach | 49296     | 25-YEAR  | 1174.00          | 47.66             | 54.58             |                   | 54.69             | 0.003333              | 4.22               | 615.66               | 376.41            | 0.32         |
| Upper Reach | 49296     | 50-YEAR  | 1432.00          | 47.66             | 54.99             |                   | 55.10             | 0.003120              | 4.29               | 780.59               | 412.19            | 0.31         |
| Upper Reach | 49296     | 100-YEAR | 1718.00          | 47.66             | 55.41             |                   | 55.51             | 0.002931              | 4.35               | 957.93               | 443.42            | 0.30         |
| Upper Reach | 49788.0   | 2-YEAR   | 464.00           | 47.04             | 53.39             |                   | 53.40             | 0.000305              | 1.15               | 577.02               | 180.43            | 0.10         |
| Upper Reach | 49788.0   | 10-YEAR  | 877.00           | 47.04             | 54.58             |                   | 54.60             | 0.000414              | 1.60               | 841.49               | 379.78            | 0.13         |
| Upper Reach | 49788.0   | 25-YEAR  | 1174.00          | 47.04             | 55.16             |                   | 55.19             | 0.000472              | 1.84               | 1114.39              | 499.17            | 0.14         |
| Upper Reach | 49788.0   | 50-YEAR  | 1432.00          | 47.04             | 55.58             |                   | 55.61             | 0.000508              | 2.00               | 1331.88              | 524.86            | 0.14         |
| Upper Reach | 49788.0   | 100-YEAR | 1718.00          | 47.04             | 56.00             |                   | 56.04             | 0.000539              | 2.15               | 1557.21              | 550.19            | 0.15         |
| Upper Reach | 50078     | 2-YEAR   | 464.00           | 47.75             | 53.27             |                   | 53.83             | 0.012717              | 6.01               | 77.19                | 24.23             | 0.59         |
| Upper Reach | 50078     | 10-YEAR  | 877.00           | 47.75             | 54.11             | 53.57             | 55.34             | 0.023551              | 8.88               | 98.76                | 27.22             | 0.82         |
| Upper Reach | 50078     | 25-YEAR  | 1174.00          | 47.75             | 54.36             | 54.36             | 56.28             | 0.035177              | 11.10              | 105.75               | 28.13             | 1.01         |
| Upper Reach | 50078     | 50-YEAR  | 1432.00          | 47.75             | 56.36             | 56.36             | 56.89             | 0.008305              | 6.63               | 548.95               | 629.23            | 0.51         |
| Upper Reach | 50078     | 100-YEAR | 1718.00          | 47.75             | 56.53             | 56.53             | 57.09             | 0.009008              | 7.06               | 659.66               | 638.13            | 0.54         |
| Upper Reach | 50144.8   | 2-YEAR   | 464.00           | 47.85             | 54.14             | 51.84             | 54.33             | 0.003239              | 3.46               | 136.94               | 67.08             | 0.33         |
| Upper Reach | 50144.8   | 10-YEAR  | 877.00           | 47.85             | 55.77             | 53.07             | 56.06             | 0.003010              | 4.31               | 218.50               | 159.40            | 0.34         |
| Upper Reach | 50144.8   | 25-YEAR  | 1174.00          | 47.85             | 56.94             | 53.73             | 57.11             | 0.001772              | 3.79               | 616.83               | 411.90            | 0.27         |
| Upper Reach | 50144.8   | 50-YEAR  | 1432.00          | 47.85             | 57.00             | 54.25             | 57.25             | 0.002502              | 4.54               | 643.05               | 432.73            | 0.32         |
| Upper Reach | 50144.8   | 100-YEAR | 1718.00          | 47.85             | 57.18             | 54.71             | 57.49             | 0.003091              | 5.14               | 724.56               | 492.60            | 0.36         |
| Upper Reach | 50167.8   |          | Bridge           |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 50190.8   | 2-YEAR   | 464.00           | 47.99             | 54.40             | 51.99             | 54.57             | 0.002899              | 3.34               | 142.62               | 75.83             | 0.31         |
| Upper Reach | 50190.8   | 10-YEAR  | 877.00           | 47.99             | 56.10             | 53.21             | 56.36             | 0.002661              | 4.15               | 227.59               | 180.50            | 0.32         |
| Upper Reach | 50190.8   | 25-YEAR  | 1174.00          | 47.99             | 57.53             | 53.88             | 57.81             | 0.002059              | 4.28               | 299.05               | 567.13            | 0.29         |
| Upper Reach | 50190.8   | 50-YEAR  | 1432.00          | 47.99             | 58.22             | 54.39             | 58.29             | 0.000870              | 2.97               | 1282.87              | 699.24            | 0.19         |
| Upper Reach | 50190.8   | 100-YEAR | 1718.00          | 47.99             | 58.58             | 54.85             | 58.65             | 0.000844              | 3.02               | 1542.40              | 742.40            | 0.19         |
| Upper Reach | 50286.0   | 2-YEAR   | 420.00           | 48.25             | 54.69             |                   | 54.83             | 0.002281              | 2.98               | 157.21               | 145.95            | 0.28         |
| Upper Reach | 50286.0   | 10-YEAR  | 787.00           | 48.25             | 56.50             |                   | 56.55             | 0.000777              | 2.28               | 798.99               | 454.34            | 0.17         |
| Upper Reach | 50286.0   | 25-YEAR  | 1051.00          | 48.25             | 57.92             |                   | 57.94             | 0.000327              | 1.73               | 1558.84              | 634.20            | 0.12         |
| Upper Reach | 50286.0   | 50-YEAR  | 1279.00          | 48.25             | 58.35             |                   | 58.37             | 0.000333              | 1.82               | 1843.09              | 695.41            | 0.12         |
| Upper Reach | 50286.0   | 100-YEAR | 1534.00          | 48.25             | 58.70             |                   | 58.72             | 0.000347              | 1.92               | 2096.72              | 745.73            | 0.12         |
| Upper Reach | 50622     | 2-YEAR   | 420.00           | 48.89             | 55.46             |                   | 55.58             | 0.002203              | 3.32               | 332.22               | 269.58            | 0.26         |

# FORK SWAMP MAIN BRANCH: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 50622     | 10-YEAR  | 787.00           | 48.89             | 56.82             |                   | 56.88             | 0.001261              | 2.94               | 836.00               | 446.11            | 0.20         |
| Upper Reach | 50622     | 25-YEAR  | 1051.00          | 48.89             | 58.06             |                   | 58.08             | 0.000590              | 2.26               | 1465.31              | 566.73            | 0.14         |
| Upper Reach | 50622     | 50-YEAR  | 1279.00          | 48.89             | 58.49             |                   | 58.51             | 0.000582              | 2.33               | 1715.10              | 598.30            | 0.14         |
| Upper Reach | 50622     | 100-YEAR | 1534.00          | 48.89             | 58.85             |                   | 58.87             | 0.000612              | 2.46               | 1934.40              | 624.70            | 0.15         |
| Upper Reach | 51042     | 2-YEAR   | 420.00           | 49.51             | 56.29             |                   | 56.37             | 0.001611              | 2.63               | 390.78               | 463.67            | 0.23         |
| Upper Reach | 51042     | 10-YEAR  | 787.00           | 49.51             | 57.33             |                   | 57.37             | 0.001093              | 2.47               | 982.57               | 654.92            | 0.19         |
| Upper Reach | 51042     | 25-YEAR  | 1051.00          | 49.51             | 58.30             |                   | 58.32             | 0.000526              | 1.93               | 1671.12              | 741.67            | 0.14         |
| Upper Reach | 51042     | 50-YEAR  | 1279.00          | 49.51             | 58.72             |                   | 58.74             | 0.000484              | 1.93               | 1986.30              | 763.54            | 0.13         |
| Upper Reach | 51042     | 100-YEAR | 1534.00          | 49.51             | 59.08             |                   | 59.10             | 0.000480              | 1.99               | 2267.93              | 782.77            | 0.13         |
| Upper Reach | 51532.0   | 2-YEAR   | 420.00           | 50.48             | 57.05             |                   | 57.13             | 0.001501              | 2.48               | 339.46               | 333.29            | 0.23         |
| Upper Reach | 51532.0   | 10-YEAR  | 787.00           | 50.48             | 57.94             |                   | 58.03             | 0.001623              | 2.97               | 664.99               | 415.36            | 0.24         |
| Upper Reach | 51532.0   | 25-YEAR  | 1051.00          | 50.48             | 58.64             |                   | 58.72             | 0.001296              | 2.92               | 1018.60              | 704.37            | 0.22         |
| Upper Reach | 51532.0   | 50-YEAR  | 1279.00          | 50.48             | 59.04             |                   | 59.11             | 0.001237              | 2.99               | 1334.76              | 860.59            | 0.22         |
| Upper Reach | 51532.0   | 100-YEAR | 1534.00          | 50.48             | 59.40             |                   | 59.47             | 0.001183              | 3.04               | 1664.83              | 942.90            | 0.22         |
| Upper Reach | 52049.0   | 2-YEAR   | 397.00           | 50.64             | 57.72             |                   | 57.79             | 0.001084              | 2.29               | 270.76               | 306.57            | 0.20         |
| Upper Reach | 52049.0   | 10-YEAR  | 744.00           | 50.64             | 58.67             |                   | 58.77             | 0.001240              | 2.81               | 728.17               | 650.25            | 0.22         |
| Upper Reach | 52049.0   | 25-YEAR  | 992.00           | 50.64             | 59.25             |                   | 59.33             | 0.001066              | 2.79               | 1136.47              | 772.61            | 0.20         |
| Upper Reach | 52049.0   | 50-YEAR  | 1206.00          | 50.64             | 59.62             |                   | 59.69             | 0.001005              | 2.83               | 1429.38              | 819.36            | 0.20         |
| Upper Reach | 52049.0   | 100-YEAR | 1444.00          | 50.64             | 59.96             |                   | 60.03             | 0.000980              | 2.89               | 1713.46              | 859.77            | 0.20         |
| Upper Reach | 52380     | 2-YEAR   | 397.00           | 50.74             | 58.03             |                   | 58.12             | 0.000876              | 2.43               | 239.43               | 329.72            | 0.20         |
| Upper Reach | 52380     | 10-YEAR  | 744.00           | 50.74             | 59.02             |                   | 59.11             | 0.000869              | 2.76               | 732.21               | 580.49            | 0.21         |
| Upper Reach | 52380     | 25-YEAR  | 992.00           | 50.74             | 59.56             |                   | 59.63             | 0.000781              | 2.78               | 1069.53              | 665.10            | 0.20         |
| Upper Reach | 52380     | 50-YEAR  | 1206.00          | 50.74             | 59.91             |                   | 59.98             | 0.000748              | 2.82               | 1308.27              | 698.64            | 0.20         |
| Upper Reach | 52380     | 100-YEAR | 1444.00          | 50.74             | 60.25             |                   | 60.31             | 0.000748              | 2.92               | 1549.73              | 742.36            | 0.20         |
| Upper Reach | 52610     | 2-YEAR   | 397.00           | 51.93             | 58.28             |                   | 58.40             | 0.001670              | 2.91               | 233.21               | 287.42            | 0.27         |
| Upper Reach | 52610     | 10-YEAR  | 744.00           | 51.93             | 59.25             |                   | 59.37             | 0.001519              | 3.21               | 547.73               | 385.60            | 0.26         |
| Upper Reach | 52610     | 25-YEAR  | 992.00           | 51.93             | 59.76             |                   | 59.87             | 0.001404              | 3.31               | 778.44               | 510.52            | 0.26         |
| Upper Reach | 52610     | 50-YEAR  | 1206.00          | 51.93             | 60.10             |                   | 60.20             | 0.001365              | 3.40               | 956.55               | 532.82            | 0.26         |
| Upper Reach | 52610     | 100-YEAR | 1444.00          | 51.93             | 60.44             |                   | 60.53             | 0.001337              | 3.50               | 1138.65              | 570.20            | 0.26         |
| Upper Reach | 53110     | 2-YEAR   | 397.00           | 52.54             | 59.12             |                   | 59.26             | 0.001770              | 3.09               | 148.40               | 138.91            | 0.27         |
| Upper Reach | 53110     | 10-YEAR  | 744.00           | 52.54             | 60.09             |                   | 60.27             | 0.002116              | 3.84               | 417.47               | 387.48            | 0.31         |
| Upper Reach | 53110     | 25-YEAR  | 992.00           | 52.54             | 60.54             |                   | 60.72             | 0.002052              | 4.01               | 603.32               | 424.19            | 0.31         |
| Upper Reach | 53110     | 50-YEAR  | 1206.00          | 52.54             | 60.87             |                   | 61.04             | 0.002029              | 4.15               | 744.53               | 449.24            | 0.31         |

# FORK SWAMP MAIN BRANCH: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 53110     | 100-YEAR | 1444.00          | 52.54             | 61.19             |                   | 61.36             | 0.002014              | 4.28               | 892.44               | 478.41            | 0.31         |
| Upper Reach | 53471     | 2-YEAR   | 258.00           | 53.33             | 59.47             | 56.30             | 59.48             | 0.000188              | 1.00               | 409.73               | 140.80            | 0.09         |
| Upper Reach | 53471     | 10-YEAR  | 488.00           | 53.33             | 60.54             | 57.49             | 60.56             | 0.000256              | 1.33               | 571.86               | 186.59            | 0.11         |
| Upper Reach | 53471     | 25-YEAR  | 644.00           | 53.33             | 61.02             | 57.60             | 61.04             | 0.000308              | 1.55               | 674.26               | 246.20            | 0.12         |
| Upper Reach | 53471     | 50-YEAR  | 785.00           | 53.33             | 61.36             | 57.75             | 61.38             | 0.000351              | 1.73               | 760.39               | 297.09            | 0.13         |
| Upper Reach | 53471     | 100-YEAR | 939.00           | 53.33             | 61.69             | 57.92             | 61.72             | 0.000392              | 1.90               | 849.46               | 320.69            | 0.14         |
| Upper Reach | 53971     | 2-YEAR   | 258.00           | 54.04             | 59.60             | 57.88             | 59.62             | 0.000473              | 1.43               | 299.14               | 131.27            | 0.14         |
| Upper Reach | 53971     | 10-YEAR  | 488.00           | 54.04             | 60.71             | 58.28             | 60.73             | 0.000511              | 1.74               | 451.65               | 151.34            | 0.15         |
| Upper Reach | 53971     | 25-YEAR  | 644.00           | 54.04             | 61.21             | 58.49             | 61.24             | 0.000569              | 1.94               | 530.93               | 163.22            | 0.16         |
| Upper Reach | 53971     | 50-YEAR  | 785.00           | 54.04             | 61.57             | 58.65             | 61.61             | 0.000632              | 2.13               | 591.51               | 172.20            | 0.17         |
| Upper Reach | 53971     | 100-YEAR | 939.00           | 54.04             | 61.93             | 58.81             | 61.97             | 0.000687              | 2.31               | 655.15               | 187.25            | 0.18         |
| Upper Reach | 54356     | 2-YEAR   | 258.00           | 54.67             | 59.79             | 57.71             | 59.81             | 0.000566              | 1.59               | 243.12               | 84.00             | 0.15         |
| Upper Reach | 54356     | 10-YEAR  | 488.00           | 54.67             | 60.91             | 58.06             | 60.95             | 0.000708              | 2.14               | 338.94               | 86.41             | 0.18         |
| Upper Reach | 54356     | 25-YEAR  | 644.00           | 54.67             | 61.44             | 58.26             | 61.49             | 0.000826              | 2.49               | 384.78               | 87.54             | 0.19         |
| Upper Reach | 54356     | 50-YEAR  | 785.00           | 54.67             | 61.82             | 58.45             | 61.89             | 0.000941              | 2.79               | 418.75               | 88.37             | 0.21         |
| Upper Reach | 54356     | 100-YEAR | 939.00           | 54.67             | 62.20             | 58.64             | 62.29             | 0.001058              | 3.09               | 452.25               | 89.18             | 0.23         |
| Upper Reach | 54540     | 2-YEAR   | 258.00           | 54.97             | 59.89             | 56.81             | 59.97             | 0.000941              | 2.15               | 119.85               | 31.84             | 0.20         |
| Upper Reach | 54540     | 10-YEAR  | 488.00           | 54.97             | 61.04             | 57.69             | 61.19             | 0.001552              | 3.08               | 158.46               | 35.32             | 0.26         |
| Upper Reach | 54540     | 25-YEAR  | 644.00           | 54.97             | 61.59             | 58.19             | 61.79             | 0.001959              | 3.62               | 178.13               | 36.96             | 0.29         |
| Upper Reach | 54540     | 50-YEAR  | 785.00           | 54.97             | 61.99             | 58.60             | 62.25             | 0.002307              | 4.06               | 193.19               | 38.22             | 0.32         |
| Upper Reach | 54540     | 100-YEAR | 939.00           | 54.97             | 62.38             | 59.00             | 62.69             | 0.002597              | 4.52               | 208.25               | 40.80             | 0.34         |
| Upper Reach | 54609     |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 54678     | 2-YEAR   | 258.00           | 54.50             | 60.29             | 56.63             | 60.35             | 0.000693              | 1.92               | 134.18               | 33.55             | 0.17         |
| Upper Reach | 54678     | 10-YEAR  | 488.00           | 54.50             | 61.90             | 57.58             | 62.00             | 0.000928              | 2.53               | 192.68               | 40.21             | 0.20         |
| Upper Reach | 54678     | 25-YEAR  | 644.00           | 54.50             | 62.86             | 58.11             | 62.98             | 0.000978              | 2.77               | 232.24               | 67.96             | 0.21         |
| Upper Reach | 54678     | 50-YEAR  | 785.00           | 54.50             | 63.78             | 58.53             | 63.91             | 0.000910              | 2.88               | 275.93               | 95.15             | 0.21         |
| Upper Reach | 54678     | 100-YEAR | 939.00           | 54.50             | 64.99             | 58.95             | 65.12             | 0.000727              | 2.86               | 336.26               | 124.15            | 0.19         |
| Upper Reach | 54971     | 2-YEAR   | 252.00           | 54.98             | 60.52             |                   | 60.54             | 0.000518              | 1.46               | 309.92               | 176.49            | 0.14         |
| Upper Reach | 54971     | 10-YEAR  | 475.00           | 54.98             | 62.14             |                   | 62.16             | 0.000256              | 1.29               | 598.82               | 179.19            | 0.10         |
| Upper Reach | 54971     | 25-YEAR  | 629.00           | 54.98             | 63.12             |                   | 63.13             | 0.000201              | 1.27               | 773.98               | 180.81            | 0.09         |
| Upper Reach | 54971     | 50-YEAR  | 765.00           | 54.98             | 64.02             |                   | 64.04             | 0.000162              | 1.23               | 938.74               | 182.32            | 0.09         |
| Upper Reach | 54971     | 100-YEAR | 916.00           | 54.98             | 65.21             |                   | 65.22             | 0.000119              | 1.18               | 1156.72              | 184.23            | 0.08         |

# FORK SWAMP MAIN BRANCH: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 55437     | 2-YEAR   | 252.00           | 54.98             | 60.73             |                   | 60.75             | 0.000372              | 1.28               | 347.72               | 176.85            | 0.12         |
| Upper Reach | 55437     | 10-YEAR  | 475.00           | 54.98             | 62.26             |                   | 62.27             | 0.000230              | 1.24               | 619.92               | 179.39            | 0.10         |
| Upper Reach | 55437     | 25-YEAR  | 629.00           | 54.98             | 63.21             |                   | 63.22             | 0.000188              | 1.24               | 791.05               | 180.97            | 0.09         |
| Upper Reach | 55437     | 50-YEAR  | 765.00           | 54.98             | 64.10             |                   | 64.11             | 0.000155              | 1.21               | 952.74               | 182.44            | 0.08         |
| Upper Reach | 55437     | 100-YEAR | 916.00           | 54.98             | 65.27             |                   | 65.28             | 0.000115              | 1.17               | 1167.15              | 184.32            | 0.07         |
| Upper Reach | 55537     | 2-YEAR   | 252.00           | 55.92             | 60.77             | 58.17             | 60.78             | 0.000309              | 1.17               | 364.64               | 177.88            | 0.12         |
| Upper Reach | 55537     | 10-YEAR  | 475.00           | 55.92             | 62.28             | 59.46             | 62.29             | 0.000207              | 1.19               | 636.43               | 180.91            | 0.10         |
| Upper Reach | 55537     | 25-YEAR  | 629.00           | 55.92             | 63.23             | 59.67             | 63.24             | 0.000170              | 1.21               | 826.14               | 255.56            | 0.09         |
| Upper Reach | 55537     | 50-YEAR  | 765.00           | 55.92             | 64.11             | 59.81             | 64.13             | 0.000136              | 1.20               | 1025.50              | 285.06            | 0.08         |
| Upper Reach | 55537     | 100-YEAR | 916.00           | 55.92             | 65.28             | 59.96             | 65.29             | 0.000099              | 1.15               | 1288.16              | 345.25            | 0.07         |
| Upper Reach | 55592     |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 55651     | 2-YEAR   | 252.00           | 57.89             | 63.03             | 59.67             | 63.09             | 0.000663              | 1.93               | 130.63               | 32.35             | 0.17         |
| Upper Reach | 55651     | 10-YEAR  | 475.00           | 57.89             | 65.03             | 60.50             | 65.11             | 0.000674              | 2.34               | 227.84               | 332.74            | 0.18         |
| Upper Reach | 55651     | 25-YEAR  | 629.00           | 57.89             | 66.42             | 60.97             | 66.48             | 0.000442              | 2.18               | 390.43               | 450.89            | 0.15         |
| Upper Reach | 55651     | 50-YEAR  | 765.00           | 57.89             | 68.02             | 61.36             | 68.07             | 0.000243              | 1.86               | 583.47               | 571.16            | 0.11         |
| Upper Reach | 55651     | 100-YEAR | 916.00           | 57.89             | 70.87             | 61.75             | 70.90             | 0.000095              | 1.41               | 925.31               | 1964.77           | 0.07         |
| Upper Reach | 55788     | 2-YEAR   | 188.00           | 57.96             | 63.14             | 60.26             | 63.20             | 0.000986              | 2.04               | 92.03                | 28.98             | 0.20         |
| Upper Reach | 55788     | 10-YEAR  | 352.00           | 57.96             | 65.13             | 61.15             | 65.21             | 0.000780              | 2.22               | 161.35               | 56.04             | 0.19         |
| Upper Reach | 55788     | 25-YEAR  | 468.00           | 57.96             | 66.50             | 61.65             | 66.55             | 0.000419              | 1.93               | 490.14               | 476.47            | 0.14         |
| Upper Reach | 55788     | 50-YEAR  | 569.00           | 57.96             | 68.09             | 62.03             | 68.10             | 0.000105              | 1.14               | 1424.98              | 812.78            | 0.08         |
| Upper Reach | 55788     | 100-YEAR | 681.00           | 57.96             | 70.91             | 62.40             | 70.91             | 0.000015              | 0.54               | 3937.09              | 2631.89           | 0.03         |
| Upper Reach | 55853     | 2-YEAR   | 188.00           | 58.92             | 63.21             | 60.37             | 63.26             | 0.000703              | 1.84               | 102.49               | 28.91             | 0.17         |
| Upper Reach | 55853     | 10-YEAR  | 352.00           | 58.92             | 65.18             | 61.05             | 65.26             | 0.000618              | 2.20               | 164.65               | 34.08             | 0.17         |
| Upper Reach | 55853     | 25-YEAR  | 468.00           | 58.92             | 66.52             | 61.46             | 66.58             | 0.000410              | 2.06               | 432.70               | 328.81            | 0.14         |
| Upper Reach | 55853     | 50-YEAR  | 569.00           | 58.92             | 68.09             | 61.79             | 68.11             | 0.000151              | 1.44               | 1045.81              | 504.53            | 0.09         |
| Upper Reach | 55853     | 100-YEAR | 681.00           | 58.92             | 70.91             | 62.12             | 70.91             | 0.000026              | 0.73               | 3060.02              | 2710.63           | 0.04         |
| Upper Reach | 55891     |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upper Reach | 55958     | 2-YEAR   | 188.00           | 58.73             | 63.87             | 60.53             | 63.92             | 0.000520              | 1.70               | 111.89               | 30.20             | 0.15         |
| Upper Reach | 55958     | 10-YEAR  | 352.00           | 58.73             | 66.00             | 61.29             | 66.06             | 0.000439              | 1.99               | 230.28               | 208.06            | 0.15         |
| Upper Reach | 55958     | 25-YEAR  | 468.00           | 58.73             | 66.55             | 61.73             | 66.62             | 0.000486              | 2.23               | 368.96               | 275.47            | 0.16         |
| Upper Reach | 55958     | 50-YEAR  | 569.00           | 58.73             | 68.10             | 62.08             | 68.12             | 0.000188              | 1.60               | 924.84               | 523.53            | 0.10         |

# FORK SWAMP MAIN BRANCH: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp Reach: Upper Reach (Continued)

| Reach       | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|-------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upper Reach | 55958     | 100-YEAR | 681.00           | 58.73             | 70.91             | 62.43             | 70.91             | 0.000026              | 0.73               | 3077.86              | 1968.68           | 0.04         |
| Upper Reach | 56230     | 2-YEAR   | 188.00           | 59.25             | 64.09             | 61.83             | 64.21             | 0.002146              | 2.84               | 66.25                | 22.07             | 0.29         |
| Upper Reach | 56230     | 10-YEAR  | 352.00           | 59.25             | 66.16             | 62.81             | 66.29             | 0.001518              | 2.93               | 127.76               | 68.89             | 0.25         |
| Upper Reach | 56230     | 25-YEAR  | 468.00           | 59.25             | 66.73             | 63.35             | 66.89             | 0.001660              | 3.27               | 195.59               | 156.54            | 0.27         |
| Upper Reach | 56230     | 50-YEAR  | 569.00           | 59.25             | 68.16             | 63.78             | 68.23             | 0.000589              | 2.33               | 573.96               | 431.63            | 0.17         |
| Upper Reach | 56230     | 100-YEAR | 681.00           | 59.25             | 70.92             | 64.19             | 70.92             | 0.000053              | 0.90               | 2403.89              | 2367.91           | 0.05         |

# FORK SWAMP UT1: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp UT1 Reach: Reach 1

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 1030      | 2-Year   | 254.00           | 45.23             | 49.19             | 47.61             | 49.20             | 0.000345              | 1.39               | 461.50               | 362.66            | 0.14         |
| Reach 1 | 1030      | 10-Year  | 529.00           | 45.23             | 50.64             | 48.55             | 50.65             | 0.000128              | 1.10               | 1271.23              | 599.73            | 0.09         |
| Reach 1 | 1030      | 25-Year  | 734.00           | 45.23             | 51.40             | 48.71             | 51.41             | 0.000097              | 1.07               | 1733.69              | 617.25            | 0.08         |
| Reach 1 | 1030      | 50-Year  | 918.00           | 45.23             | 51.94             | 48.84             | 51.95             | 0.000088              | 1.09               | 2070.36              | 629.69            | 0.08         |
| Reach 1 | 1030      | 100-Year | 1131.00          | 45.23             | 52.47             | 49.01             | 52.48             | 0.000085              | 1.14               | 2409.20              | 649.83            | 0.08         |
| Reach 1 | 1579      | 2-Year   | 254.00           | 45.55             | 49.31             |                   | 49.31             | 0.000123              | 0.83               | 832.51               | 626.74            | 0.09         |
| Reach 1 | 1579      | 10-Year  | 529.00           | 45.55             | 50.69             |                   | 50.69             | 0.000061              | 0.76               | 1764.01              | 751.99            | 0.06         |
| Reach 1 | 1579      | 25-Year  | 734.00           | 45.55             | 51.44             |                   | 51.44             | 0.000051              | 0.77               | 2362.66              | 844.43            | 0.06         |
| Reach 1 | 1579      | 50-Year  | 918.00           | 45.55             | 51.98             |                   | 51.98             | 0.000051              | 0.83               | 2852.59              | 980.32            | 0.06         |
| Reach 1 | 1579      | 100-Year | 1131.00          | 45.55             | 52.51             |                   | 52.51             | 0.000047              | 0.84               | 3383.84              | 1022.69           | 0.06         |
| Reach 1 | 1890      | 2-Year   | 254.00           | 44.89             | 49.32             |                   | 49.32             | 0.000015              | 0.31               | 1349.65              | 601.29            | 0.03         |
| Reach 1 | 1890      | 10-Year  | 529.00           | 44.89             | 50.70             |                   | 50.70             | 0.000016              | 0.41               | 2272.49              | 763.78            | 0.03         |
| Reach 1 | 1890      | 25-Year  | 734.00           | 44.89             | 51.45             |                   | 51.45             | 0.000016              | 0.45               | 2875.23              | 845.14            | 0.03         |
| Reach 1 | 1890      | 50-Year  | 918.00           | 44.89             | 51.99             |                   | 51.99             | 0.000018              | 0.51               | 3356.31              | 996.65            | 0.04         |
| Reach 1 | 1890      | 100-Year | 1131.00          | 44.89             | 52.52             |                   | 52.52             | 0.000018              | 0.54               | 3896.30              | 1049.04           | 0.04         |
| Reach 1 | 2517      | 2-Year   | 230.00           | 46.14             | 49.34             |                   | 49.35             | 0.000298              | 0.95               | 477.64               | 535.58            | 0.12         |
| Reach 1 | 2517      | 10-Year  | 462.00           | 46.14             | 50.72             |                   | 50.72             | 0.000062              | 0.63               | 1231.53              | 560.90            | 0.06         |
| Reach 1 | 2517      | 25-Year  | 634.00           | 46.14             | 51.46             |                   | 51.47             | 0.000045              | 0.62               | 1656.10              | 574.66            | 0.05         |
| Reach 1 | 2517      | 50-Year  | 788.00           | 46.14             | 52.00             |                   | 52.01             | 0.000040              | 0.64               | 1969.02              | 584.87            | 0.05         |
| Reach 1 | 2517      | 100-Year | 962.00           | 46.14             | 52.53             |                   | 52.54             | 0.000041              | 0.69               | 2293.07              | 644.83            | 0.05         |
| Reach 1 | 3185      | 2-Year   | 230.00           | 47.31             | 50.34             | 50.34             | 50.48             | 0.006962              | 4.07               | 130.71               | 320.33            | 0.57         |
| Reach 1 | 3185      | 10-Year  | 462.00           | 47.31             | 50.80             |                   | 50.87             | 0.003585              | 3.46               | 278.49               | 325.87            | 0.43         |
| Reach 1 | 3185      | 25-Year  | 634.00           | 47.31             | 51.53             |                   | 51.56             | 0.000992              | 2.24               | 520.32               | 334.73            | 0.24         |
| Reach 1 | 3185      | 50-Year  | 788.00           | 47.31             | 52.06             |                   | 52.08             | 0.000604              | 1.96               | 699.56               | 341.15            | 0.19         |
| Reach 1 | 3185      | 100-Year | 962.00           | 47.31             | 52.59             |                   | 52.61             | 0.000526              | 2.02               | 891.50               | 429.89            | 0.18         |
| Reach 1 | 3294      | 2-Year   | 230.00           | 48.24             | 50.84             | 49.93             | 50.98             | 0.003180              | 3.06               | 76.94                | 224.54            | 0.40         |
| Reach 1 | 3294      | 10-Year  | 462.00           | 48.24             | 51.17             | 50.59             | 51.55             | 0.006877              | 5.05               | 99.97                | 229.39            | 0.61         |
| Reach 1 | 3294      | 25-Year  | 634.00           | 48.24             | 51.53             | 51.09             | 52.01             | 0.007113              | 5.70               | 125.18               | 234.71            | 0.64         |
| Reach 1 | 3294      | 50-Year  | 788.00           | 48.24             | 51.98             | 51.37             | 52.46             | 0.005849              | 5.78               | 156.18               | 241.24            | 0.59         |
| Reach 1 | 3294      | 100-Year | 962.00           | 48.24             | 52.49             | 51.64             | 52.96             | 0.004765              | 5.80               | 191.30               | 248.64            | 0.55         |
| Reach 1 | 3380      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |

# FORK SWAMP UT1: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp UT1 Reach: Reach 1 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 3462      | 2-Year   | 230.00           | 48.46             | 50.95             | 50.02             | 51.10             | 0.003204              | 3.18               | 72.40                | 36.85             | 0.40         |
| Reach 1 | 3462      | 10-Year  | 462.00           | 48.46             | 51.64             | 50.67             | 51.99             | 0.004920              | 4.70               | 98.39                | 37.78             | 0.51         |
| Reach 1 | 3462      | 25-Year  | 634.00           | 48.46             | 52.30             | 51.08             | 52.71             | 0.004488              | 5.11               | 126.89               | 54.49             | 0.50         |
| Reach 1 | 3462      | 50-Year  | 788.00           | 48.46             | 53.00             | 51.41             | 53.40             | 0.003442              | 5.10               | 165.35               | 76.13             | 0.45         |
| Reach 1 | 3462      | 100-Year | 962.00           | 48.46             | 53.96             | 51.76             | 54.30             | 0.002256              | 4.78               | 227.71               | 107.23            | 0.38         |
| Reach 1 | 3544      | 2-Year   | 127.00           | 48.30             | 51.20             |                   | 51.43             | 0.004266              | 3.87               | 34.16                | 18.52             | 0.46         |
| Reach 1 | 3544      | 10-Year  | 252.00           | 48.30             | 52.03             |                   | 52.46             | 0.005836              | 5.36               | 51.27                | 23.16             | 0.56         |
| Reach 1 | 3544      | 25-Year  | 343.00           | 48.30             | 52.66             |                   | 53.15             | 0.005591              | 5.79               | 69.52                | 34.76             | 0.56         |
| Reach 1 | 3544      | 50-Year  | 425.00           | 48.30             | 53.29             |                   | 53.73             | 0.004421              | 5.70               | 95.66                | 51.05             | 0.51         |
| Reach 1 | 3544      | 100-Year | 517.00           | 48.30             | 54.18             |                   | 54.50             | 0.002653              | 5.06               | 154.70               | 84.92             | 0.41         |
| Reach 1 | 4000      | 2-Year   | 127.00           | 48.08             | 52.22             |                   | 52.29             | 0.001036              | 2.19               | 69.46                | 87.12             | 0.23         |
| Reach 1 | 4000      | 10-Year  | 252.00           | 48.08             | 53.23             |                   | 53.29             | 0.000830              | 2.27               | 177.94               | 127.74            | 0.22         |
| Reach 1 | 4000      | 25-Year  | 343.00           | 48.08             | 53.81             |                   | 53.86             | 0.000667              | 2.26               | 258.15               | 154.16            | 0.20         |
| Reach 1 | 4000      | 50-Year  | 425.00           | 48.08             | 54.27             |                   | 54.32             | 0.000544              | 2.19               | 334.69               | 167.41            | 0.18         |
| Reach 1 | 4000      | 100-Year | 517.00           | 48.08             | 54.86             |                   | 54.90             | 0.000395              | 2.03               | 434.79               | 172.20            | 0.16         |
| Reach 1 | 4181      | 2-Year   | 127.00           | 47.72             | 52.39             | 49.75             | 52.42             | 0.000454              | 1.55               | 82.13                | 28.26             | 0.16         |
| Reach 1 | 4181      | 10-Year  | 252.00           | 47.72             | 53.37             | 50.44             | 53.45             | 0.000761              | 2.26               | 112.00               | 52.53             | 0.21         |
| Reach 1 | 4181      | 25-Year  | 343.00           | 47.72             | 53.92             | 50.86             | 54.02             | 0.000841              | 2.55               | 161.53               | 128.01            | 0.23         |
| Reach 1 | 4181      | 50-Year  | 425.00           | 47.72             | 54.37             | 51.18             | 54.46             | 0.000740              | 2.58               | 249.24               | 231.22            | 0.22         |
| Reach 1 | 4181      | 100-Year | 517.00           | 47.72             | 54.93             | 51.52             | 54.99             | 0.000508              | 2.31               | 393.89               | 276.45            | 0.18         |
| Reach 1 | 4235      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 4289      | 2-Year   | 127.00           | 48.47             | 52.40             | 50.30             | 52.45             | 0.000793              | 1.85               | 68.72                | 27.92             | 0.21         |
| Reach 1 | 4289      | 10-Year  | 252.00           | 48.47             | 53.48             | 51.02             | 53.58             | 0.000996              | 2.49               | 101.59               | 54.13             | 0.24         |
| Reach 1 | 4289      | 25-Year  | 343.00           | 48.47             | 54.19             | 51.43             | 54.31             | 0.000978              | 2.77               | 124.49               | 112.66            | 0.25         |
| Reach 1 | 4289      | 50-Year  | 425.00           | 48.47             | 54.73             | 51.76             | 54.82             | 0.000710              | 2.58               | 237.33               | 154.99            | 0.22         |
| Reach 1 | 4289      | 100-Year | 517.00           | 48.47             | 55.16             | 52.09             | 55.24             | 0.000638              | 2.60               | 307.61               | 172.04            | 0.21         |
| Reach 1 | 4389      | 2-Year   | 123.00           | 48.47             | 52.48             |                   | 52.52             | 0.000679              | 1.73               | 71.02                | 28.31             | 0.19         |
| Reach 1 | 4389      | 10-Year  | 244.00           | 48.47             | 53.59             |                   | 53.67             | 0.000804              | 2.28               | 117.35               | 57.35             | 0.22         |
| Reach 1 | 4389      | 25-Year  | 332.00           | 48.47             | 54.32             |                   | 54.40             | 0.000695              | 2.39               | 178.89               | 125.24            | 0.21         |
| Reach 1 | 4389      | 50-Year  | 412.00           | 48.47             | 54.81             |                   | 54.89             | 0.000619              | 2.43               | 251.73               | 171.30            | 0.20         |
| Reach 1 | 4389      | 100-Year | 500.00           | 48.47             | 55.23             |                   | 55.30             | 0.000565              | 2.47               | 331.29               | 206.32            | 0.20         |

# FORK SWAMP UT1: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp UT1 Reach: Reach 1 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 4764      | 2-Year   | 123.00           | 47.90             | 52.75             |                   | 52.82             | 0.000881              | 2.10               | 60.88                | 27.64             | 0.22         |
| Reach 1 | 4764      | 10-Year  | 244.00           | 47.90             | 53.91             |                   | 54.02             | 0.000997              | 2.75               | 110.18               | 66.51             | 0.24         |
| Reach 1 | 4764      | 25-Year  | 332.00           | 47.90             | 54.59             |                   | 54.70             | 0.000878              | 2.87               | 170.27               | 103.10            | 0.23         |
| Reach 1 | 4764      | 50-Year  | 412.00           | 47.90             | 55.06             |                   | 55.16             | 0.000812              | 2.94               | 219.78               | 111.28            | 0.23         |
| Reach 1 | 4764      | 100-Year | 500.00           | 47.90             | 55.46             |                   | 55.56             | 0.000790              | 3.05               | 266.14               | 119.14            | 0.23         |
| Reach 1 | 5050      | 2-Year   | 123.00           | 49.18             | 53.00             | 50.78             | 53.05             | 0.000700              | 1.83               | 67.37                | 24.70             | 0.19         |
| Reach 1 | 5050      | 10-Year  | 244.00           | 49.18             | 54.20             | 51.47             | 54.30             | 0.000928              | 2.45               | 99.41                | 28.50             | 0.23         |
| Reach 1 | 5050      | 25-Year  | 332.00           | 49.18             | 54.86             | 51.87             | 54.98             | 0.001047              | 2.79               | 118.87               | 30.57             | 0.25         |
| Reach 1 | 5050      | 50-Year  | 412.00           | 49.18             | 55.31             | 52.21             | 55.45             | 0.001106              | 3.07               | 146.14               | 83.55             | 0.26         |
| Reach 1 | 5050      | 100-Year | 500.00           | 49.18             | 55.70             | 52.55             | 55.86             | 0.001135              | 3.30               | 184.38               | 110.77            | 0.27         |
| Reach 1 | 5103      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 5154      | 2-Year   | 123.00           | 49.76             | 53.14             | 51.33             | 53.22             | 0.001232              | 2.24               | 54.85                | 22.59             | 0.25         |
| Reach 1 | 5154      | 10-Year  | 244.00           | 49.76             | 54.57             | 52.07             | 54.68             | 0.001094              | 2.68               | 94.22                | 39.99             | 0.25         |
| Reach 1 | 5154      | 25-Year  | 332.00           | 49.76             | 55.62             | 52.50             | 55.73             | 0.000799              | 2.70               | 134.61               | 129.46            | 0.22         |
| Reach 1 | 5154      | 50-Year  | 412.00           | 49.76             | 56.13             | 52.85             | 56.21             | 0.000631              | 2.57               | 247.50               | 149.94            | 0.20         |
| Reach 1 | 5154      | 100-Year | 500.00           | 49.76             | 56.38             | 53.20             | 56.48             | 0.000719              | 2.84               | 288.33               | 177.41            | 0.22         |
| Reach 1 | 5289      | 2-Year   | 123.00           | 49.08             | 53.32             |                   | 53.44             | 0.001876              | 2.80               | 46.15                | 24.00             | 0.31         |
| Reach 1 | 5289      | 10-Year  | 244.00           | 49.08             | 54.73             |                   | 54.84             | 0.001248              | 2.99               | 125.68               | 117.98            | 0.27         |
| Reach 1 | 5289      | 25-Year  | 332.00           | 49.08             | 55.79             |                   | 55.83             | 0.000489              | 2.20               | 297.01               | 205.61            | 0.18         |
| Reach 1 | 5289      | 50-Year  | 412.00           | 49.08             | 56.26             |                   | 56.29             | 0.000391              | 2.09               | 402.59               | 233.97            | 0.16         |
| Reach 1 | 5289      | 100-Year | 500.00           | 49.08             | 56.53             |                   | 56.57             | 0.000398              | 2.18               | 468.18               | 249.43            | 0.16         |



# FORK SWAMP UT2R1: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp UT2 Reach: Reach 1

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 694.0     | 2-Year   | 330.00           | 45.13             | 49.80             | 47.92             | 50.06             | 0.004033              | 4.11               | 111.71               | 212.87            | 0.38         |
| Reach 1 | 694.0     | 10-Year  | 629.00           | 45.13             | 51.01             | 49.12             | 51.13             | 0.002088              | 3.57               | 649.30               | 535.07            | 0.28         |
| Reach 1 | 694.0     | 25-Year  | 844.00           | 45.13             | 51.72             | 50.55             | 51.79             | 0.001338              | 3.12               | 1051.99              | 597.25            | 0.23         |
| Reach 1 | 694.0     | 50-Year  | 1035.00          | 45.13             | 52.25             | 50.72             | 52.30             | 0.001051              | 2.94               | 1379.85              | 639.96            | 0.21         |
| Reach 1 | 694.0     | 100-Year | 1246.00          | 45.13             | 52.78             | 50.89             | 52.82             | 0.000849              | 2.79               | 1730.28              | 682.44            | 0.19         |
| Reach 1 | 1255.9    | 2-Year   | 330.00           | 46.84             | 51.54             |                   | 51.63             | 0.002020              | 2.92               | 319.38               | 297.84            | 0.27         |
| Reach 1 | 1255.9    | 10-Year  | 629.00           | 46.84             | 52.28             |                   | 52.39             | 0.002423              | 3.61               | 572.42               | 385.74            | 0.30         |
| Reach 1 | 1255.9    | 25-Year  | 844.00           | 46.84             | 52.69             |                   | 52.81             | 0.002523              | 3.91               | 743.88               | 435.33            | 0.31         |
| Reach 1 | 1255.9    | 50-Year  | 1035.00          | 46.84             | 53.07             |                   | 53.18             | 0.002413              | 4.01               | 916.64               | 504.51            | 0.31         |
| Reach 1 | 1255.9    | 100-Year | 1246.00          | 46.84             | 53.46             |                   | 53.56             | 0.002193              | 4.01               | 1129.32              | 566.91            | 0.30         |
| Reach 1 | 1877.0    | 2-Year   | 330.00           | 47.35             | 52.59             |                   | 52.67             | 0.001401              | 2.66               | 388.99               | 431.18            | 0.23         |
| Reach 1 | 1877.0    | 10-Year  | 629.00           | 47.35             | 53.44             |                   | 53.51             | 0.001398              | 3.00               | 865.89               | 692.12            | 0.23         |
| Reach 1 | 1877.0    | 25-Year  | 844.00           | 47.35             | 53.85             |                   | 53.91             | 0.001308              | 3.06               | 1162.32              | 735.91            | 0.23         |
| Reach 1 | 1877.0    | 50-Year  | 1035.00          | 47.35             | 54.17             |                   | 54.23             | 0.001247              | 3.10               | 1404.94              | 769.92            | 0.23         |
| Reach 1 | 1877.0    | 100-Year | 1246.00          | 47.35             | 54.50             |                   | 54.55             | 0.001193              | 3.14               | 1659.42              | 804.04            | 0.22         |
| Reach 1 | 2384.0    | 2-Year   | 265.00           | 47.08             | 52.99             |                   | 53.01             | 0.000335              | 1.43               | 652.89               | 461.29            | 0.11         |
| Reach 1 | 2384.0    | 10-Year  | 502.00           | 47.08             | 53.86             |                   | 53.87             | 0.000383              | 1.71               | 1063.38              | 484.20            | 0.12         |
| Reach 1 | 2384.0    | 25-Year  | 672.00           | 47.08             | 54.27             |                   | 54.30             | 0.000435              | 1.91               | 1269.86              | 504.76            | 0.13         |
| Reach 1 | 2384.0    | 50-Year  | 819.00           | 47.08             | 54.60             |                   | 54.63             | 0.000478              | 2.07               | 1437.50              | 519.67            | 0.14         |
| Reach 1 | 2384.0    | 100-Year | 985.00           | 47.08             | 54.92             |                   | 54.95             | 0.000512              | 2.21               | 1607.29              | 528.50            | 0.15         |
| Reach 1 | 2971.0    | 2-Year   | 265.00           | 46.38             | 53.26             |                   | 53.33             | 0.000932              | 2.25               | 247.20               | 216.83            | 0.18         |
| Reach 1 | 2971.0    | 10-Year  | 502.00           | 46.38             | 54.17             |                   | 54.26             | 0.001212              | 2.88               | 487.62               | 309.41            | 0.22         |
| Reach 1 | 2971.0    | 25-Year  | 672.00           | 46.38             | 54.63             |                   | 54.73             | 0.001339              | 3.20               | 640.83               | 362.29            | 0.23         |
| Reach 1 | 2971.0    | 50-Year  | 819.00           | 46.38             | 54.99             |                   | 55.09             | 0.001381              | 3.37               | 782.05               | 429.97            | 0.24         |
| Reach 1 | 2971.0    | 100-Year | 985.00           | 46.38             | 55.34             |                   | 55.44             | 0.001395              | 3.51               | 942.77               | 495.82            | 0.24         |
| Reach 1 | 3403.0    | 2-Year   | 265.00           | 46.52             | 53.37             |                   | 53.38             | 0.000034              | 0.49               | 972.32               | 271.32            | 0.04         |
| Reach 1 | 3403.0    | 10-Year  | 502.00           | 46.52             | 54.34             |                   | 54.34             | 0.000059              | 0.72               | 1254.51              | 326.73            | 0.05         |
| Reach 1 | 3403.0    | 25-Year  | 672.00           | 46.52             | 54.83             |                   | 54.83             | 0.000076              | 0.86               | 1443.71              | 425.83            | 0.06         |
| Reach 1 | 3403.0    | 50-Year  | 819.00           | 46.52             | 55.20             |                   | 55.20             | 0.000089              | 0.96               | 1604.67              | 443.17            | 0.06         |
| Reach 1 | 3403.0    | 100-Year | 985.00           | 46.52             | 55.55             |                   | 55.56             | 0.000103              | 1.07               | 1766.21              | 459.92            | 0.07         |
| Reach 1 | 3469.8    | 2-Year   | 265.00           | 46.75             | 53.33             | 49.45             | 53.43             | 0.001230              | 2.56               | 106.14               | 75.04             | 0.21         |
| Reach 1 | 3469.8    | 10-Year  | 502.00           | 46.75             | 54.23             | 50.64             | 54.48             | 0.002452              | 4.06               | 129.41               | 288.16            | 0.30         |

# FORK SWAMP UT2R1: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 River: Fork Swamp UT2 Reach: Reach 1 (Continued)

| Reach   | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 3469.8    | 25-Year  | 672.00           | 46.75             | 54.65             | 51.33             | 55.04             | 0.003433              | 5.04               | 140.42               | 354.44            | 0.36         |
| Reach 1 | 3469.8    | 50-Year  | 819.00           | 46.75             | 55.11             | 51.88             | 55.32             | 0.002179              | 4.22               | 576.72               | 404.41            | 0.29         |
| Reach 1 | 3469.8    | 100-Year | 985.00           | 46.75             | 55.48             | 52.52             | 55.67             | 0.002131              | 4.33               | 731.01               | 436.46            | 0.29         |
| Reach 1 | 3499.8    |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 3529.8    | 2-Year   | 265.00           | 46.96             | 53.39             | 49.66             | 53.50             | 0.001373              | 2.65               | 102.17               | 57.44             | 0.22         |
| Reach 1 | 3529.8    | 10-Year  | 502.00           | 46.96             | 54.43             | 50.85             | 54.68             | 0.002466              | 4.07               | 129.16               | 286.22            | 0.30         |
| Reach 1 | 3529.8    | 25-Year  | 672.00           | 46.96             | 55.02             | 51.53             | 55.39             | 0.003139              | 4.91               | 144.62               | 373.64            | 0.35         |
| Reach 1 | 3529.8    | 50-Year  | 819.00           | 46.96             | 55.54             | 52.09             | 56.00             | 0.003545              | 5.50               | 158.15               | 426.06            | 0.37         |
| Reach 1 | 3529.8    | 100-Year | 985.00           | 46.96             | 56.17             | 52.74             | 56.35             | 0.001826              | 4.19               | 613.42               | 448.57            | 0.27         |
| Reach 1 | 3921.0    | 2-Year   | 265.00           | 48.00             | 53.88             |                   | 53.93             | 0.000842              | 2.20               | 334.81               | 217.79            | 0.18         |
| Reach 1 | 3921.0    | 10-Year  | 502.00           | 48.00             | 55.18             |                   | 55.23             | 0.000747              | 2.46               | 689.22               | 355.17            | 0.18         |
| Reach 1 | 3921.0    | 25-Year  | 672.00           | 48.00             | 55.93             |                   | 55.98             | 0.000670              | 2.53               | 997.84               | 445.57            | 0.18         |
| Reach 1 | 3921.0    | 50-Year  | 819.00           | 48.00             | 56.54             |                   | 56.58             | 0.000570              | 2.48               | 1287.03              | 497.81            | 0.16         |
| Reach 1 | 3921.0    | 100-Year | 985.00           | 48.00             | 56.76             |                   | 56.81             | 0.000684              | 2.77               | 1397.62              | 516.39            | 0.18         |

# FORK SWAMP UT3: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 3 | 237.0     | 2 YR    | 442.00           | 45.84             | 50.65             | 50.39             | 50.78             | 0.003504              | 3.72               | 534.16               | 882.14            | 0.36         |
| Reach 3 | 237.0     | 10 YR   | 857.00           | 45.84             | 51.19             | 50.73             | 51.29             | 0.003504              | 4.11               | 1149.15              | 1403.77           | 0.37         |
| Reach 3 | 237.0     | 25 YR   | 1151.00          | 45.84             | 51.43             | 50.90             | 51.52             | 0.003500              | 4.27               | 1495.59              | 1555.20           | 0.37         |
| Reach 3 | 237.0     | 50 YR   | 1414.00          | 45.84             | 51.60             | 51.10             | 51.69             | 0.003502              | 4.39               | 1783.94              | 1670.80           | 0.37         |
| Reach 3 | 237.0     | 100 YR  | 1702.00          | 45.84             | 51.77             | 51.21             | 51.85             | 0.003502              | 4.50               | 2060.37              | 1731.44           | 0.38         |
| Reach 3 | 614.5     | 2 YR    | 442.00           | 47.18             | 51.51             |                   | 51.53             | 0.001267              | 2.01               | 960.95               | 904.99            | 0.21         |
| Reach 3 | 614.5     | 10 YR   | 857.00           | 47.18             | 52.08             |                   | 52.10             | 0.001419              | 2.40               | 1506.26              | 1036.50           | 0.23         |
| Reach 3 | 614.5     | 25 YR   | 1151.00          | 47.18             | 52.39             |                   | 52.42             | 0.001690              | 2.78               | 1861.22              | 1270.17           | 0.25         |
| Reach 3 | 614.5     | 50 YR   | 1414.00          | 47.18             | 52.59             |                   | 52.62             | 0.001811              | 2.98               | 2124.30              | 1306.31           | 0.27         |
| Reach 3 | 614.5     | 100 YR  | 1702.00          | 47.18             | 52.77             |                   | 52.80             | 0.001898              | 3.15               | 2361.22              | 1313.59           | 0.27         |
| Reach 3 | 1000.0    | 2 YR    | 442.00           | 47.70             | 52.06             |                   | 52.09             | 0.001659              | 2.32               | 975.08               | 1283.45           | 0.24         |
| Reach 3 | 1000.0    | 10 YR   | 857.00           | 47.70             | 52.61             |                   | 52.63             | 0.001352              | 2.35               | 1726.01              | 1402.94           | 0.22         |
| Reach 3 | 1000.0    | 25 YR   | 1151.00          | 47.70             | 52.95             |                   | 52.97             | 0.001212              | 2.37               | 2206.55              | 1465.93           | 0.22         |
| Reach 3 | 1000.0    | 50 YR   | 1414.00          | 47.70             | 53.17             |                   | 53.19             | 0.001224              | 2.48               | 2541.18              | 1531.62           | 0.22         |
| Reach 3 | 1000.0    | 100 YR  | 1702.00          | 47.70             | 53.38             |                   | 53.39             | 0.001269              | 2.61               | 2853.86              | 1564.87           | 0.22         |
| Reach 3 | 1481.0    | 2 YR    | 442.00           | 47.90             | 52.81             |                   | 52.85             | 0.001524              | 2.50               | 757.40               | 745.85            | 0.24         |
| Reach 3 | 1481.0    | 10 YR   | 857.00           | 47.90             | 53.36             |                   | 53.40             | 0.001885              | 3.07               | 1179.00              | 834.99            | 0.27         |
| Reach 3 | 1481.0    | 25 YR   | 1151.00          | 47.90             | 53.67             |                   | 53.72             | 0.002027              | 3.34               | 1453.50              | 909.35            | 0.29         |
| Reach 3 | 1481.0    | 50 YR   | 1414.00          | 47.90             | 53.91             |                   | 53.96             | 0.002112              | 3.54               | 1675.07              | 940.76            | 0.29         |
| Reach 3 | 1481.0    | 100 YR  | 1702.00          | 47.90             | 54.14             |                   | 54.19             | 0.002200              | 3.74               | 1895.46              | 970.99            | 0.30         |
| Reach 3 | 1948.0    | 2 YR    | 442.00           | 48.10             | 53.26             |                   | 53.27             | 0.000569              | 1.60               | 1053.78              | 614.83            | 0.15         |
| Reach 3 | 1948.0    | 10 YR   | 857.00           | 48.10             | 53.93             |                   | 53.95             | 0.000786              | 2.10               | 1472.65              | 629.68            | 0.18         |
| Reach 3 | 1948.0    | 25 YR   | 1151.00          | 48.10             | 54.30             |                   | 54.32             | 0.000899              | 2.38               | 1710.16              | 638.91            | 0.19         |
| Reach 3 | 1948.0    | 50 YR   | 1414.00          | 48.10             | 54.59             |                   | 54.61             | 0.000992              | 2.60               | 1893.77              | 645.98            | 0.20         |
| Reach 3 | 1948.0    | 100 YR  | 1702.00          | 48.10             | 54.87             |                   | 54.89             | 0.001088              | 2.82               | 2074.14              | 656.05            | 0.22         |
| Reach 3 | 2532.0    | 2 YR    | 409.00           | 48.25             | 53.76             |                   | 53.96             | 0.003192              | 4.03               | 301.48               | 433.88            | 0.35         |
| Reach 3 | 2532.0    | 10 YR   | 787.00           | 48.25             | 54.60             |                   | 54.75             | 0.002799              | 4.28               | 700.29               | 501.85            | 0.34         |
| Reach 3 | 2532.0    | 25 YR   | 1058.00          | 48.25             | 55.04             |                   | 55.18             | 0.002682              | 4.44               | 929.20               | 528.04            | 0.34         |
| Reach 3 | 2532.0    | 50 YR   | 1295.00          | 48.25             | 55.38             |                   | 55.52             | 0.002664              | 4.61               | 1115.69              | 565.79            | 0.34         |
| Reach 3 | 2532.0    | 100 YR  | 1556.00          | 48.25             | 55.71             |                   | 55.85             | 0.002645              | 4.77               | 1308.12              | 597.29            | 0.34         |
| Reach 3 | 3000.0    | 2 YR    | 409.00           | 48.35             | 54.17             |                   | 54.17             | 0.000154              | 0.57               | 715.11               | 203.81            | 0.05         |
| Reach 3 | 3000.0    | 10 YR   | 787.00           | 48.35             | 55.06             |                   | 55.07             | 0.000285              | 0.87               | 901.66               | 214.68            | 0.08         |

# FORK SWAMP UT3: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 3 | 3000.0    | 25 YR   | 1058.00          | 48.35             | 55.55             |                   | 55.56             | 0.000370              | 1.05               | 1007.66              | 220.62            | 0.09         |
| Reach 3 | 3000.0    | 50 YR   | 1295.00          | 48.35             | 55.93             |                   | 55.95             | 0.000437              | 1.19               | 1092.28              | 225.25            | 0.09         |
| Reach 3 | 3000.0    | 100 YR  | 1556.00          | 48.35             | 56.29             |                   | 56.32             | 0.000501              | 1.32               | 1189.55              | 289.37            | 0.10         |
| Reach 3 | 3500.0    | 2 YR    | 409.00           | 48.57             | 54.31             |                   | 54.33             | 0.000825              | 1.15               | 354.40               | 160.78            | 0.14         |
| Reach 3 | 3500.0    | 10 YR   | 787.00           | 48.57             | 55.29             |                   | 55.33             | 0.001059              | 1.51               | 524.26               | 196.70            | 0.16         |
| Reach 3 | 3500.0    | 25 YR   | 1058.00          | 48.57             | 55.83             |                   | 55.88             | 0.001168              | 1.69               | 641.85               | 234.65            | 0.17         |
| Reach 3 | 3500.0    | 50 YR   | 1295.00          | 48.57             | 56.25             |                   | 56.30             | 0.001209              | 1.83               | 741.18               | 243.14            | 0.17         |
| Reach 3 | 3500.0    | 100 YR  | 1556.00          | 48.57             | 56.64             |                   | 56.70             | 0.001264              | 1.97               | 839.40               | 251.25            | 0.17         |
| Reach 3 | 3830.0    | 2 YR    | 409.00           | 49.16             | 54.57             |                   | 54.60             | 0.000819              | 1.31               | 311.58               | 110.53            | 0.14         |
| Reach 3 | 3830.0    | 10 YR   | 787.00           | 49.16             | 55.65             |                   | 55.70             | 0.001160              | 1.81               | 435.18               | 120.36            | 0.17         |
| Reach 3 | 3830.0    | 25 YR   | 1058.00          | 49.16             | 56.23             |                   | 56.30             | 0.001346              | 2.09               | 509.26               | 155.23            | 0.18         |
| Reach 3 | 3830.0    | 50 YR   | 1295.00          | 49.16             | 56.66             |                   | 56.74             | 0.001452              | 2.30               | 595.80               | 242.96            | 0.19         |
| Reach 3 | 3830.0    | 100 YR  | 1556.00          | 49.16             | 57.08             |                   | 57.17             | 0.001540              | 2.49               | 709.67               | 303.61            | 0.20         |
| Reach 3 | 4129.0    | 2 YR    | 409.00           | 49.79             | 54.85             |                   | 54.88             | 0.001070              | 1.53               | 267.89               | 95.24             | 0.16         |
| Reach 3 | 4129.0    | 10 YR   | 787.00           | 49.79             | 56.01             |                   | 56.08             | 0.001360              | 2.06               | 382.29               | 101.47            | 0.19         |
| Reach 3 | 4129.0    | 25 YR   | 1058.00          | 49.79             | 56.64             |                   | 56.73             | 0.001535              | 2.36               | 447.72               | 104.86            | 0.20         |
| Reach 3 | 4129.0    | 50 YR   | 1295.00          | 49.79             | 57.11             |                   | 57.22             | 0.001683              | 2.60               | 497.43               | 107.37            | 0.21         |
| Reach 3 | 4129.0    | 100 YR  | 1556.00          | 49.79             | 57.56             |                   | 57.69             | 0.001842              | 2.85               | 546.25               | 112.70            | 0.23         |
| Reach 3 | 4545      | 2 YR    | 409.00           | 49.53             | 55.32             |                   | 55.36             | 0.001225              | 1.66               | 246.07               | 101.87            | 0.19         |
| Reach 3 | 4545      | 10 YR   | 787.00           | 49.53             | 56.57             |                   | 56.64             | 0.001333              | 2.05               | 402.33               | 170.05            | 0.20         |
| Reach 3 | 4545      | 25 YR   | 1058.00          | 49.53             | 57.26             |                   | 57.33             | 0.001340              | 2.21               | 536.47               | 222.69            | 0.20         |
| Reach 3 | 4545      | 50 YR   | 1295.00          | 49.53             | 57.76             |                   | 57.84             | 0.001317              | 2.30               | 673.09               | 402.74            | 0.20         |
| Reach 3 | 4545      | 100 YR  | 1556.00          | 49.53             | 58.23             |                   | 58.31             | 0.001232              | 2.35               | 934.70               | 630.71            | 0.19         |
| Reach 3 | 4815      | 2 YR    | 349.00           | 49.53             | 55.66             |                   | 55.68             | 0.001116              | 1.26               | 276.84               | 98.29             | 0.13         |
| Reach 3 | 4815      | 10 YR   | 667.00           | 49.53             | 56.96             |                   | 57.00             | 0.001318              | 1.62               | 410.63               | 107.26            | 0.15         |
| Reach 3 | 4815      | 25 YR   | 898.00           | 49.53             | 57.65             |                   | 57.71             | 0.001457              | 1.84               | 488.71               | 118.40            | 0.16         |
| Reach 3 | 4815      | 50 YR   | 1095.00          | 49.53             | 58.16             |                   | 58.22             | 0.001555              | 2.00               | 570.08               | 275.58            | 0.16         |
| Reach 3 | 4815      | 100 YR  | 1314.00          | 49.53             | 58.61             |                   | 58.68             | 0.001539              | 2.12               | 716.82               | 355.31            | 0.16         |
| Reach 3 | 4953      | 2 YR    | 349.00           | 49.00             | 55.79             | 51.99             | 55.81             | 0.000834              | 1.12               | 310.66               | 110.93            | 0.12         |
| Reach 3 | 4953      | 10 YR   | 667.00           | 49.00             | 57.12             | 53.84             | 57.15             | 0.000953              | 1.43               | 465.17               | 121.72            | 0.13         |
| Reach 3 | 4953      | 25 YR   | 898.00           | 49.00             | 57.84             | 54.11             | 57.88             | 0.001053              | 1.62               | 554.48               | 127.55            | 0.14         |
| Reach 3 | 4953      | 50 YR   | 1095.00          | 49.00             | 58.36             | 54.30             | 58.41             | 0.001119              | 1.76               | 624.71               | 150.69            | 0.14         |

# FORK SWAMP UT3: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 3 | 4953      | 100 YR  | 1314.00          | 49.00             | 58.81             | 54.51             | 58.87             | 0.001215              | 1.92               | 707.01               | 291.13            | 0.15         |
| Reach 3 | 5065      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 3 | 5206      | 2 YR    | 349.00           | 50.65             | 55.77             | 53.90             | 55.99             | 0.003932              | 3.70               | 94.20                | 31.76             | 0.38         |
| Reach 3 | 5206      | 10 YR   | 667.00           | 50.65             | 57.23             | 55.06             | 57.55             | 0.004298              | 4.57               | 148.52               | 74.66             | 0.41         |
| Reach 3 | 5206      | 25 YR   | 898.00           | 50.65             | 58.26             | 55.72             | 58.59             | 0.003327              | 4.71               | 207.39               | 154.37            | 0.38         |
| Reach 3 | 5206      | 50 YR   | 1095.00          | 50.65             | 59.15             | 56.20             | 59.48             | 0.002657              | 4.71               | 259.23               | 220.86            | 0.35         |
| Reach 3 | 5206      | 100 YR  | 1314.00          | 50.65             | 59.95             | 56.67             | 60.04             | 0.000431              | 2.07               | 632.17               | 248.26            | 0.14         |
| Reach 3 | 5363      | 2 YR    | 338.00           | 50.34             | 56.33             |                   | 56.49             | 0.002461              | 3.18               | 106.45               | 31.16             | 0.30         |
| Reach 3 | 5363      | 10 YR   | 647.00           | 50.34             | 57.87             |                   | 58.12             | 0.002837              | 4.00               | 180.67               | 109.50            | 0.34         |
| Reach 3 | 5363      | 25 YR   | 868.00           | 50.34             | 58.82             |                   | 59.04             | 0.002154              | 3.97               | 318.91               | 184.67            | 0.30         |
| Reach 3 | 5363      | 50 YR   | 1061.00          | 50.34             | 59.67             |                   | 59.83             | 0.001491              | 3.65               | 504.29               | 251.16            | 0.26         |
| Reach 3 | 5363      | 100 YR  | 1274.00          | 50.34             | 60.02             |                   | 60.20             | 0.001581              | 3.90               | 597.05               | 278.34            | 0.27         |
| Reach 3 | 5832      | 2 YR    | 338.00           | 50.38             | 56.88             |                   | 56.91             | 0.000451              | 1.64               | 270.17               | 73.91             | 0.14         |
| Reach 3 | 5832      | 10 YR   | 647.00           | 50.38             | 58.57             |                   | 58.62             | 0.000531              | 2.08               | 415.20               | 121.42            | 0.15         |
| Reach 3 | 5832      | 25 YR   | 868.00           | 50.38             | 59.45             |                   | 59.51             | 0.000550              | 2.32               | 527.63               | 129.58            | 0.16         |
| Reach 3 | 5832      | 50 YR   | 1061.00          | 50.38             | 60.17             |                   | 60.24             | 0.000536              | 2.46               | 640.54               | 182.94            | 0.16         |
| Reach 3 | 5832      | 100 YR  | 1274.00          | 50.38             | 60.57             |                   | 60.65             | 0.000619              | 2.74               | 717.08               | 199.96            | 0.18         |
| Reach 3 | 6307      | 2 YR    | 338.00           | 50.89             | 57.04             |                   | 57.05             | 0.000196              | 1.06               | 443.60               | 121.69            | 0.09         |
| Reach 3 | 6307      | 10 YR   | 647.00           | 50.89             | 58.76             |                   | 58.77             | 0.000201              | 1.27               | 657.01               | 126.99            | 0.09         |
| Reach 3 | 6307      | 25 YR   | 868.00           | 50.89             | 59.65             |                   | 59.67             | 0.000209              | 1.42               | 793.63               | 181.55            | 0.10         |
| Reach 3 | 6307      | 50 YR   | 1061.00          | 50.89             | 60.37             |                   | 60.39             | 0.000207              | 1.51               | 930.11               | 195.19            | 0.10         |
| Reach 3 | 6307      | 100 YR  | 1274.00          | 50.89             | 60.79             |                   | 60.82             | 0.000236              | 1.68               | 1013.68              | 195.87            | 0.11         |
| Reach 3 | 6769      | 2 YR    | 338.00           | 51.67             | 57.09             |                   | 57.39             | 0.005270              | 4.40               | 76.84                | 23.47             | 0.43         |
| Reach 3 | 6769      | 10 YR   | 647.00           | 51.67             | 58.72             |                   | 59.17             | 0.005939              | 5.42               | 119.41               | 29.00             | 0.47         |
| Reach 3 | 6769      | 25 YR   | 868.00           | 51.67             | 59.55             |                   | 60.11             | 0.006392              | 6.00               | 144.77               | 31.84             | 0.50         |
| Reach 3 | 6769      | 50 YR   | 1061.00          | 51.67             | 60.22             |                   | 60.85             | 0.006414              | 6.34               | 172.70               | 69.49             | 0.50         |
| Reach 3 | 6769      | 100 YR  | 1274.00          | 51.67             | 60.61             | 58.44             | 61.35             | 0.007163              | 6.95               | 207.31               | 109.19            | 0.54         |
| Reach 2 | 7068      | 2 YR    | 192.00           | 52.43             | 58.29             |                   | 58.39             | 0.001716              | 2.54               | 75.44                | 21.93             | 0.24         |
| Reach 2 | 7068      | 10 YR   | 341.00           | 52.43             | 60.09             |                   | 60.22             | 0.001571              | 2.84               | 119.92               | 27.39             | 0.24         |
| Reach 2 | 7068      | 25 YR   | 452.00           | 52.43             | 61.05             |                   | 61.19             | 0.001542              | 3.06               | 149.00               | 33.26             | 0.24         |
| Reach 2 | 7068      | 50 YR   | 542.00           | 52.43             | 61.74             |                   | 61.90             | 0.001412              | 3.19               | 180.11               | 52.33             | 0.24         |

# FORK SWAMP UT3: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 7068      | 100 YR  | 643.00           | 52.43             | 62.25             |                   | 62.39             | 0.001228              | 3.15               | 266.80               | 276.19            | 0.22         |
| Reach 2 | 7210      | 2 YR    | 192.00           | 52.66             | 58.52             | 55.52             | 58.60             | 0.001199              | 2.29               | 90.34                | 59.65             | 0.21         |
| Reach 2 | 7210      | 10 YR   | 341.00           | 52.66             | 60.31             | 56.45             | 60.40             | 0.001039              | 2.57               | 143.51               | 70.25             | 0.20         |
| Reach 2 | 7210      | 25 YR   | 452.00           | 52.66             | 61.29             | 57.03             | 61.34             | 0.000486              | 1.94               | 325.31               | 97.91             | 0.14         |
| Reach 2 | 7210      | 50 YR   | 542.00           | 52.66             | 61.99             | 57.47             | 62.03             | 0.000428              | 1.97               | 410.04               | 186.68            | 0.14         |
| Reach 2 | 7210      | 100 YR  | 643.00           | 52.66             | 62.48             | 57.84             | 62.51             | 0.000370              | 1.92               | 566.69               | 344.90            | 0.13         |
| Reach 2 | 7287      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 7363      | 2 YR    | 192.00           | 54.55             | 58.42             | 56.88             | 58.62             | 0.004569              | 3.60               | 53.39                | 20.19             | 0.39         |
| Reach 2 | 7363      | 10 YR   | 341.00           | 54.55             | 60.24             | 57.73             | 60.44             | 0.002972              | 3.58               | 95.24                | 25.81             | 0.33         |
| Reach 2 | 7363      | 25 YR   | 452.00           | 54.55             | 61.31             | 58.24             | 61.52             | 0.002452              | 3.62               | 126.14               | 37.38             | 0.31         |
| Reach 2 | 7363      | 50 YR   | 542.00           | 54.55             | 62.00             | 58.62             | 62.21             | 0.002108              | 3.68               | 163.07               | 71.05             | 0.29         |
| Reach 2 | 7363      | 100 YR  | 643.00           | 54.55             | 62.42             | 59.00             | 62.64             | 0.002133              | 3.91               | 206.06               | 121.71            | 0.30         |
| Reach 2 | 7530      | 2 YR    | 192.00           | 54.56             | 59.06             |                   | 59.18             | 0.002374              | 2.80               | 68.54                | 23.17             | 0.29         |
| Reach 2 | 7530      | 10 YR   | 341.00           | 54.56             | 60.71             |                   | 60.86             | 0.002003              | 3.06               | 111.49               | 28.77             | 0.27         |
| Reach 2 | 7530      | 25 YR   | 452.00           | 54.56             | 61.72             |                   | 61.87             | 0.001677              | 3.14               | 156.57               | 58.69             | 0.26         |
| Reach 2 | 7530      | 50 YR   | 542.00           | 54.56             | 62.38             |                   | 62.50             | 0.001278              | 2.98               | 249.61               | 171.00            | 0.23         |
| Reach 2 | 7530      | 100 YR  | 643.00           | 54.56             | 62.82             |                   | 62.93             | 0.001072              | 2.88               | 331.02               | 217.36            | 0.21         |
| Reach 2 | 7641      | 2 YR    | 192.00           | 55.18             | 59.34             | 57.50             | 59.48             | 0.003019              | 3.01               | 63.77                | 23.53             | 0.32         |
| Reach 2 | 7641      | 10 YR   | 341.00           | 55.18             | 60.95             | 58.31             | 61.11             | 0.002381              | 3.21               | 106.28               | 29.54             | 0.30         |
| Reach 2 | 7641      | 25 YR   | 452.00           | 55.18             | 61.91             | 58.80             | 62.08             | 0.002051              | 3.32               | 136.37               | 58.47             | 0.28         |
| Reach 2 | 7641      | 50 YR   | 542.00           | 55.18             | 62.53             | 59.15             | 62.66             | 0.001570              | 3.10               | 249.16               | 249.43            | 0.25         |
| Reach 2 | 7641      | 100 YR  | 643.00           | 55.18             | 62.96             | 59.51             | 63.05             | 0.001140              | 2.80               | 361.20               | 273.30            | 0.22         |
| Reach 2 | 7694      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 7753      | 2 YR    | 192.00           | 55.77             | 59.41             | 57.74             | 59.55             | 0.003098              | 2.97               | 64.72                | 25.29             | 0.33         |
| Reach 2 | 7753      | 10 YR   | 341.00           | 55.77             | 61.12             | 58.48             | 61.26             | 0.002081              | 3.00               | 113.57               | 31.97             | 0.28         |
| Reach 2 | 7753      | 25 YR   | 452.00           | 55.77             | 62.33             | 58.93             | 62.47             | 0.001529              | 2.91               | 156.31               | 107.08            | 0.25         |
| Reach 2 | 7753      | 50 YR   | 542.00           | 55.77             | 62.92             | 59.26             | 63.06             | 0.001461              | 3.06               | 180.33               | 135.83            | 0.25         |
| Reach 2 | 7753      | 100 YR  | 643.00           | 55.77             | 63.26             | 59.60             | 63.39             | 0.001320              | 3.04               | 297.14               | 212.10            | 0.24         |
| Reach 2 | 7901      | 2 YR    | 174.00           | 54.62             | 59.79             |                   | 59.86             | 0.001354              | 2.26               | 101.35               | 83.95             | 0.22         |
| Reach 2 | 7901      | 10 YR   | 305.00           | 54.62             | 61.41             |                   | 61.45             | 0.000663              | 1.94               | 248.29               | 105.11            | 0.16         |

# FORK SWAMP UT3: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 7901      | 25 YR   | 399.00           | 54.62             | 62.57             |                   | 62.60             | 0.000399              | 1.72               | 453.32               | 274.59            | 0.13         |
| Reach 2 | 7901      | 50 YR   | 469.00           | 54.62             | 63.16             |                   | 63.18             | 0.000274              | 1.52               | 633.29               | 336.24            | 0.11         |
| Reach 2 | 7901      | 100 YR  | 551.00           | 54.62             | 63.48             |                   | 63.50             | 0.000259              | 1.53               | 746.34               | 366.07            | 0.11         |
| Reach 2 | 8186      | 2 YR    | 174.00           | 56.86             | 60.31             | 58.71             | 60.43             | 0.002931              | 2.78               | 62.66                | 26.24             | 0.32         |
| Reach 2 | 8186      | 10 YR   | 305.00           | 56.86             | 61.68             | 59.38             | 61.82             | 0.002304              | 2.97               | 102.69               | 32.18             | 0.29         |
| Reach 2 | 8186      | 25 YR   | 399.00           | 56.86             | 62.73             | 59.77             | 62.86             | 0.001733              | 2.87               | 138.81               | 36.72             | 0.26         |
| Reach 2 | 8186      | 50 YR   | 469.00           | 56.86             | 63.26             | 60.04             | 63.40             | 0.001658              | 2.95               | 158.93               | 52.74             | 0.26         |
| Reach 2 | 8186      | 100 YR  | 551.00           | 56.86             | 63.57             | 60.32             | 63.72             | 0.001799              | 3.17               | 180.48               | 81.57             | 0.27         |
| Reach 2 | 8238      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 8296      | 2 YR    | 174.00           | 57.00             | 60.40             | 58.97             | 60.53             | 0.003638              | 2.95               | 58.99                | 26.78             | 0.35         |
| Reach 2 | 8296      | 10 YR   | 305.00           | 57.00             | 61.83             | 59.65             | 61.97             | 0.002466              | 2.97               | 102.84               | 34.40             | 0.30         |
| Reach 2 | 8296      | 25 YR   | 399.00           | 57.00             | 63.04             | 60.04             | 63.16             | 0.001507              | 2.69               | 149.92               | 51.28             | 0.25         |
| Reach 2 | 8296      | 50 YR   | 469.00           | 57.00             | 63.73             | 60.31             | 63.83             | 0.001222              | 2.62               | 191.43               | 64.74             | 0.23         |
| Reach 2 | 8296      | 100 YR  | 551.00           | 57.00             | 64.04             | 60.58             | 64.16             | 0.001351              | 2.85               | 219.56               | 203.85            | 0.24         |
| Reach 2 | 8514      | 2 YR    | 113.00           | 55.88             | 60.79             |                   | 60.81             | 0.000396              | 1.17               | 90.70                | 52.94             | 0.12         |
| Reach 2 | 8514      | 10 YR   | 196.00           | 55.88             | 62.07             |                   | 62.10             | 0.000124              | 0.75               | 183.69               | 92.17             | 0.07         |
| Reach 2 | 8514      | 25 YR   | 255.00           | 55.88             | 63.20             |                   | 63.22             | 0.000039              | 0.46               | 314.09               | 138.86            | 0.04         |
| Reach 2 | 8514      | 50 YR   | 297.00           | 55.88             | 63.87             |                   | 63.88             | 0.000022              | 0.37               | 415.61               | 166.49            | 0.03         |
| Reach 2 | 8514      | 100 YR  | 347.00           | 55.88             | 64.20             |                   | 64.21             | 0.000021              | 0.37               | 483.33               | 260.30            | 0.03         |
| Reach 2 | 8701      | 2 YR    | 113.00           | 57.57             | 60.90             | 59.03             | 60.95             | 0.001438              | 1.90               | 59.46                | 25.76             | 0.22         |
| Reach 2 | 8701      | 10 YR   | 196.00           | 57.57             | 62.11             | 59.55             | 62.17             | 0.001228              | 2.09               | 93.85                | 31.13             | 0.21         |
| Reach 2 | 8701      | 25 YR   | 255.00           | 57.57             | 63.20             | 59.85             | 63.26             | 0.000844              | 1.95               | 130.59               | 35.99             | 0.18         |
| Reach 2 | 8701      | 50 YR   | 297.00           | 57.57             | 63.86             | 60.05             | 63.92             | 0.000717              | 1.91               | 155.18               | 38.91             | 0.17         |
| Reach 2 | 8701      | 100 YR  | 347.00           | 57.57             | 64.19             | 60.27             | 64.25             | 0.000786              | 2.06               | 168.86               | 50.87             | 0.18         |
| Reach 2 | 8790      |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 8863      | 2 YR    | 113.00           | 58.65             | 61.06             | 59.88             | 61.14             | 0.002461              | 2.17               | 52.11                | 28.20             | 0.28         |
| Reach 2 | 8863      | 10 YR   | 196.00           | 58.65             | 62.39             | 60.28             | 62.46             | 0.001368              | 2.12               | 92.42                | 32.76             | 0.22         |
| Reach 2 | 8863      | 25 YR   | 255.00           | 58.65             | 63.51             | 60.53             | 63.57             | 0.000844              | 1.94               | 131.34               | 36.62             | 0.18         |
| Reach 2 | 8863      | 50 YR   | 297.00           | 58.65             | 64.31             | 60.69             | 64.36             | 0.000634              | 1.83               | 161.88               | 39.39             | 0.16         |
| Reach 2 | 8863      | 100 YR  | 347.00           | 58.65             | 64.74             | 60.88             | 64.80             | 0.000648              | 1.93               | 180.46               | 53.74             | 0.16         |

# FORK SWAMP UT3: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 9043      | 2 YR    | 65.00            | 57.96             | 61.45             |                   | 61.49             | 0.001341              | 1.69               | 38.35                | 18.24             | 0.21         |
| Reach 2 | 9043      | 10 YR   | 115.00           | 57.96             | 62.63             |                   | 62.69             | 0.001098              | 1.85               | 62.28                | 22.08             | 0.19         |
| Reach 2 | 9043      | 25 YR   | 150.00           | 57.96             | 63.67             |                   | 63.72             | 0.000753              | 1.73               | 86.87                | 25.44             | 0.16         |
| Reach 2 | 9043      | 50 YR   | 181.00           | 57.96             | 64.43             |                   | 64.48             | 0.000619              | 1.69               | 107.29               | 27.92             | 0.15         |
| Reach 2 | 9043      | 100 YR  | 214.00           | 57.96             | 64.87             |                   | 64.92             | 0.000643              | 1.79               | 119.74               | 29.33             | 0.16         |
| Reach 2 | 9621      | 2 YR    | 65.00            | 59.00             | 61.50             |                   | 61.50             | 0.000002              | 0.08               | 802.80               | 344.10            | 0.01         |
| Reach 2 | 9621      | 10 YR   | 115.00           | 59.00             | 62.70             |                   | 62.70             | 0.000002              | 0.10               | 1227.23              | 366.22            | 0.01         |
| Reach 2 | 9621      | 25 YR   | 150.00           | 59.00             | 63.72             |                   | 63.72             | 0.000001              | 0.10               | 1612.93              | 385.22            | 0.01         |
| Reach 2 | 9621      | 50 YR   | 181.00           | 59.00             | 64.49             |                   | 64.49             | 0.000001              | 0.10               | 1912.09              | 399.34            | 0.01         |
| Reach 2 | 9621      | 100 YR  | 214.00           | 59.00             | 64.93             |                   | 64.93             | 0.000001              | 0.11               | 2090.02              | 407.51            | 0.01         |
| Reach 2 | 9935      | 2 YR    | 65.00            | 59.79             | 61.37             | 61.37             | 61.88             | 0.040041              | 5.72               | 11.36                | 11.43             | 1.01         |
| Reach 2 | 9935      | 10 YR   | 115.00           | 59.79             | 62.49             |                   | 62.79             | 0.011598              | 4.40               | 26.14                | 14.95             | 0.59         |
| Reach 2 | 9935      | 25 YR   | 150.00           | 59.79             | 63.60             |                   | 63.78             | 0.004461              | 3.35               | 44.74                | 18.44             | 0.38         |
| Reach 2 | 9935      | 50 YR   | 181.00           | 59.79             | 64.39             |                   | 64.53             | 0.002891              | 3.01               | 60.20                | 20.90             | 0.31         |
| Reach 2 | 9935      | 100 YR  | 214.00           | 59.79             | 64.83             |                   | 64.97             | 0.002723              | 3.07               | 69.62                | 22.27             | 0.31         |
| Reach 2 | 10250     | 2 YR    | 65.00            | 58.71             | 63.00             |                   | 63.03             | 0.001207              | 1.34               | 48.40                | 47.81             | 0.24         |
| Reach 2 | 10250     | 10 YR   | 115.00           | 58.71             | 63.66             |                   | 63.69             | 0.001216              | 1.43               | 80.65                | 50.83             | 0.20         |
| Reach 2 | 10250     | 25 YR   | 150.00           | 58.71             | 64.29             |                   | 64.32             | 0.000861              | 1.32               | 113.67               | 53.74             | 0.16         |
| Reach 2 | 10250     | 50 YR   | 181.00           | 58.71             | 64.89             |                   | 64.91             | 0.000633              | 1.23               | 146.68               | 56.51             | 0.13         |
| Reach 2 | 10250     | 100 YR  | 214.00           | 58.71             | 65.30             |                   | 65.33             | 0.000585              | 1.25               | 170.63               | 58.43             | 0.13         |
| Reach 2 | 10351     | 2 YR    | 65.00            | 59.76             | 63.09             | 60.96             | 63.12             | 0.000620              | 1.24               | 52.27                | 22.48             | 0.14         |
| Reach 2 | 10351     | 10 YR   | 115.00           | 59.76             | 63.76             | 61.37             | 63.80             | 0.000932              | 1.69               | 68.01                | 24.88             | 0.18         |
| Reach 2 | 10351     | 25 YR   | 150.00           | 59.76             | 64.37             | 61.60             | 64.42             | 0.000892              | 1.79               | 83.80                | 27.08             | 0.18         |
| Reach 2 | 10351     | 50 YR   | 181.00           | 59.76             | 64.95             | 61.80             | 65.00             | 0.000797              | 1.81               | 100.10               | 29.17             | 0.17         |
| Reach 2 | 10351     | 100 YR  | 214.00           | 59.76             | 65.36             | 61.99             | 65.41             | 0.000812              | 1.90               | 112.43               | 30.66             | 0.18         |
| Reach 2 | 10420     |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 2 | 10507     | 2 YR    | 65.00            | 59.70             | 63.12             | 61.54             | 63.19             | 0.002179              | 2.04               | 31.91                | 16.38             | 0.26         |
| Reach 2 | 10507     | 10 YR   | 115.00           | 59.70             | 63.96             | 62.10             | 64.06             | 0.002407              | 2.44               | 47.06                | 19.72             | 0.28         |
| Reach 2 | 10507     | 25 YR   | 150.00           | 59.70             | 64.79             | 62.40             | 64.87             | 0.001730              | 2.32               | 64.87                | 28.90             | 0.24         |
| Reach 2 | 10507     | 50 YR   | 181.00           | 59.70             | 65.62             | 62.65             | 65.69             | 0.001122              | 2.14               | 86.66                | 74.99             | 0.20         |
| Reach 2 | 10507     | 100 YR  | 214.00           | 59.70             | 66.21             | 62.88             | 66.24             | 0.000511              | 1.56               | 169.26               | 141.34            | 0.14         |



# FORK SWAMP UT3: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 2 | 10695     | 2 YR    | 65.00            | 60.49             | 63.42             |                   | 63.46             | 0.000961              | 1.48               | 43.93                | 19.86             | 0.18         |
| Reach 2 | 10695     | 10 YR   | 115.00           | 60.49             | 64.31             |                   | 64.36             | 0.001110              | 1.83               | 62.85                | 22.77             | 0.19         |
| Reach 2 | 10695     | 25 YR   | 150.00           | 60.49             | 65.06             |                   | 65.12             | 0.000943              | 1.85               | 80.90                | 25.23             | 0.18         |
| Reach 2 | 10695     | 50 YR   | 181.00           | 60.49             | 65.82             |                   | 65.87             | 0.000753              | 1.80               | 100.81               | 27.70             | 0.17         |
| Reach 2 | 10695     | 100 YR  | 214.00           | 60.49             | 66.31             |                   | 66.36             | 0.000738              | 1.86               | 114.82               | 29.31             | 0.17         |
| Reach 2 | 11090     | 2 YR    | 65.00            | 60.95             | 63.90             |                   | 63.95             | 0.001600              | 1.78               | 36.51                | 18.62             | 0.22         |
| Reach 2 | 11090     | 10 YR   | 115.00           | 60.95             | 64.82             |                   | 64.89             | 0.001590              | 2.08               | 55.36                | 22.08             | 0.23         |
| Reach 2 | 11090     | 25 YR   | 150.00           | 60.95             | 65.50             |                   | 65.57             | 0.001365              | 2.11               | 71.12                | 24.60             | 0.22         |
| Reach 2 | 11090     | 50 YR   | 181.00           | 60.95             | 66.16             |                   | 66.23             | 0.001104              | 2.05               | 88.31                | 27.08             | 0.20         |
| Reach 2 | 11090     | 100 YR  | 214.00           | 60.95             | 66.64             |                   | 66.71             | 0.001052              | 2.10               | 101.76               | 28.87             | 0.20         |
| Reach 2 | 11509     | 2 YR    | 65.00            | 61.70             | 64.74             |                   | 64.81             | 0.002744              | 2.23               | 29.15                | 15.64             | 0.29         |
| Reach 2 | 11509     | 10 YR   | 115.00           | 61.70             | 65.65             |                   | 65.75             | 0.002659              | 2.56               | 44.93                | 18.97             | 0.29         |
| Reach 2 | 11509     | 25 YR   | 150.00           | 61.70             | 66.22             |                   | 66.33             | 0.002455              | 2.66               | 56.37                | 21.07             | 0.29         |
| Reach 2 | 11509     | 50 YR   | 181.00           | 61.70             | 66.76             |                   | 66.87             | 0.002135              | 2.65               | 68.28                | 23.04             | 0.27         |
| Reach 2 | 11509     | 100 YR  | 214.00           | 61.70             | 67.21             |                   | 67.32             | 0.002020              | 2.71               | 78.98                | 24.68             | 0.27         |
| Reach 2 | 11906     | 2 YR    | 65.00            | 63.69             | 67.93             | 67.93             | 68.86             | 0.082668              | 7.73               | 8.41                 | 4.65              | 1.01         |
| Reach 2 | 11906     | 10 YR   | 115.00           | 63.69             | 68.89             | 68.89             | 70.01             | 0.070848              | 8.49               | 13.55                | 6.12              | 1.01         |
| Reach 2 | 11906     | 25 YR   | 150.00           | 63.69             | 69.40             | 69.40             | 70.63             | 0.065871              | 8.87               | 16.92                | 6.91              | 1.00         |
| Reach 2 | 11906     | 50 YR   | 181.00           | 63.69             | 70.31             | 70.31             | 70.56             | 0.015079              | 4.94               | 121.38               | 359.34            | 0.50         |
| Reach 2 | 11906     | 100 YR  | 214.00           | 63.69             | 70.35             | 70.35             | 70.62             | 0.016897              | 5.27               | 135.10               | 372.29            | 0.53         |
| Reach 2 | 12134     | 2 YR    | 65.00            | 68.81             | 71.32             |                   | 71.41             | 0.004026              | 2.64               | 38.83                | 63.72             | 0.35         |
| Reach 2 | 12134     | 10 YR   | 115.00           | 68.81             | 71.68             | 71.00             | 71.73             | 0.002518              | 2.37               | 105.31               | 279.55            | 0.29         |
| Reach 2 | 12134     | 25 YR   | 150.00           | 68.81             | 71.84             |                   | 71.87             | 0.001669              | 2.03               | 154.58               | 327.30            | 0.24         |
| Reach 2 | 12134     | 50 YR   | 181.00           | 68.81             | 71.81             |                   | 71.86             | 0.002904              | 2.65               | 144.69               | 325.60            | 0.31         |
| Reach 2 | 12134     | 100 YR  | 214.00           | 68.81             | 71.87             | 71.71             | 71.93             | 0.002796              | 2.65               | 165.84               | 329.23            | 0.31         |
| Reach 1 | 36        | 2 YR    | 152.00           | 51.73             | 57.34             |                   | 57.42             | 0.001414              | 2.25               | 67.41                | 20.10             | 0.22         |
| Reach 1 | 36        | 10 YR   | 306.00           | 51.73             | 59.08             |                   | 59.20             | 0.001680              | 2.87               | 106.55               | 24.89             | 0.24         |
| Reach 1 | 36        | 25 YR   | 419.00           | 51.73             | 60.01             |                   | 60.15             | 0.001666              | 3.07               | 182.23               | 123.03            | 0.25         |
| Reach 1 | 36        | 50 YR   | 519.00           | 51.73             | 60.78             |                   | 60.90             | 0.001369              | 2.93               | 292.65               | 162.34            | 0.23         |
| Reach 1 | 36        | 100 YR  | 632.00           | 51.73             | 61.30             |                   | 61.41             | 0.001313              | 2.97               | 383.66               | 186.87            | 0.22         |
| Reach 1 | 219       | 2 YR    | 152.00           | 53.60             | 57.66             | 55.76             | 57.77             | 0.002550              | 2.65               | 57.27                | 22.36             | 0.29         |
| Reach 1 | 219       | 10 YR   | 306.00           | 53.60             | 59.42             | 56.71             | 59.56             | 0.002144              | 2.98               | 102.74               | 29.41             | 0.28         |

# FORK SWAMP UT3: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 219       | 25 YR   | 419.00           | 53.60             | 60.34             | 57.24             | 60.50             | 0.002071              | 3.18               | 131.59               | 38.82             | 0.28         |
| Reach 1 | 219       | 50 YR   | 519.00           | 53.60             | 61.05             | 57.66             | 61.22             | 0.001970              | 3.29               | 165.30               | 52.65             | 0.28         |
| Reach 1 | 219       | 100 YR  | 632.00           | 53.60             | 61.56             | 58.07             | 61.75             | 0.002100              | 3.53               | 194.41               | 62.02             | 0.29         |
| Reach 1 | 289       |         | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Reach 1 | 367       | 2 YR    | 152.00           | 54.13             | 57.67             | 56.17             | 57.79             | 0.003159              | 2.79               | 54.55                | 23.96             | 0.33         |
| Reach 1 | 367       | 10 YR   | 306.00           | 54.13             | 59.47             | 57.00             | 59.60             | 0.002148              | 2.93               | 104.34               | 31.38             | 0.28         |
| Reach 1 | 367       | 25 YR   | 419.00           | 54.13             | 60.47             | 57.49             | 60.62             | 0.001881              | 3.04               | 138.04               | 35.54             | 0.27         |
| Reach 1 | 367       | 50 YR   | 519.00           | 54.13             | 61.34             | 57.86             | 61.48             | 0.001639              | 3.05               | 170.15               | 39.09             | 0.26         |
| Reach 1 | 367       | 100 YR  | 632.00           | 54.13             | 62.01             | 58.24             | 62.17             | 0.001623              | 3.20               | 197.62               | 81.38             | 0.26         |
| Reach 1 | 468       | 2 YR    | 152.00           | 54.53             | 58.00             |                   | 58.14             | 0.003574              | 3.03               | 50.24                | 20.59             | 0.34         |
| Reach 1 | 468       | 10 YR   | 306.00           | 54.53             | 59.70             |                   | 59.88             | 0.002931              | 3.39               | 90.21                | 26.42             | 0.32         |
| Reach 1 | 468       | 25 YR   | 419.00           | 54.53             | 60.67             |                   | 60.87             | 0.002681              | 3.56               | 117.63               | 29.77             | 0.32         |
| Reach 1 | 468       | 50 YR   | 519.00           | 54.53             | 61.50             |                   | 61.71             | 0.002405              | 3.61               | 143.58               | 32.62             | 0.30         |
| Reach 1 | 468       | 100 YR  | 632.00           | 54.53             | 62.18             |                   | 62.40             | 0.002401              | 3.80               | 166.34               | 34.94             | 0.31         |
| Reach 1 | 981       | 2 YR    | 145.00           | 54.12             | 58.99             |                   | 59.04             | 0.001009              | 1.90               | 76.21                | 24.06             | 0.19         |
| Reach 1 | 981       | 10 YR   | 292.00           | 54.12             | 60.69             |                   | 60.78             | 0.001141              | 2.39               | 121.94               | 29.53             | 0.21         |
| Reach 1 | 981       | 25 YR   | 400.00           | 54.12             | 61.66             |                   | 61.76             | 0.001185              | 2.63               | 151.86               | 32.61             | 0.22         |
| Reach 1 | 981       | 50 YR   | 497.00           | 54.12             | 62.44             |                   | 62.56             | 0.001185              | 2.79               | 178.44               | 35.12             | 0.22         |
| Reach 1 | 981       | 100 YR  | 604.00           | 54.12             | 63.14             |                   | 63.27             | 0.001228              | 2.97               | 203.62               | 37.34             | 0.22         |
| Reach 1 | 1414      | 2 YR    | 145.00           | 55.23             | 59.51             |                   | 59.59             | 0.001549              | 2.25               | 64.41                | 21.51             | 0.23         |
| Reach 1 | 1414      | 10 YR   | 292.00           | 55.23             | 61.25             |                   | 61.37             | 0.001597              | 2.74               | 106.52               | 26.67             | 0.24         |
| Reach 1 | 1414      | 25 YR   | 400.00           | 55.23             | 62.23             |                   | 62.37             | 0.001615              | 2.99               | 133.95               | 29.55             | 0.25         |
| Reach 1 | 1414      | 50 YR   | 497.00           | 55.23             | 63.01             |                   | 63.16             | 0.001601              | 3.15               | 157.91               | 31.85             | 0.25         |
| Reach 1 | 1414      | 100 YR  | 604.00           | 55.23             | 63.72             |                   | 63.89             | 0.001632              | 3.33               | 181.28               | 33.95             | 0.25         |
| Reach 1 | 1933      | 2 YR    | 145.00           | 55.85             | 60.24             |                   | 60.30             | 0.001221              | 1.98               | 73.33                | 25.94             | 0.21         |
| Reach 1 | 1933      | 10 YR   | 292.00           | 55.85             | 62.00             |                   | 62.08             | 0.001168              | 2.33               | 125.26               | 33.21             | 0.21         |
| Reach 1 | 1933      | 25 YR   | 400.00           | 55.85             | 62.98             |                   | 63.07             | 0.001140              | 2.50               | 159.77               | 37.27             | 0.21         |
| Reach 1 | 1933      | 50 YR   | 497.00           | 55.85             | 63.75             |                   | 63.86             | 0.001108              | 2.62               | 189.85               | 40.48             | 0.21         |
| Reach 1 | 1933      | 100 YR  | 604.00           | 55.85             | 64.47             |                   | 64.59             | 0.001100              | 2.74               | 220.16               | 43.47             | 0.21         |
| Reach 1 | 2409      | 2 YR    | 145.00           | 55.66             | 60.79             |                   | 60.85             | 0.001098              | 2.02               | 71.61                | 21.14             | 0.19         |
| Reach 1 | 2409      | 10 YR   | 292.00           | 55.66             | 62.57             |                   | 62.67             | 0.001285              | 2.58               | 113.17               | 25.64             | 0.22         |

# FORK SWAMP UT3: ALTERNATIVE 1

HEC-RAS Plan: FINAL ALT 1 (Continued)

| Reach   | River Sta | Profile | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Reach 1 | 2409      | 25 YR   | 400.00           | 55.66             | 63.55             |                   | 63.68             | 0.001371              | 2.87               | 139.58               | 28.13             | 0.23         |
| Reach 1 | 2409      | 50 YR   | 497.00           | 55.66             | 64.31             |                   | 64.46             | 0.001385              | 3.06               | 169.16               | 53.59             | 0.23         |
| Reach 1 | 2409      | 100 YR  | 604.00           | 55.66             | 65.02             |                   | 65.18             | 0.001369              | 3.23               | 212.44               | 66.94             | 0.23         |
| Reach 1 | 2917      | 2 YR    | 112.00           | 56.19             | 61.19             |                   | 61.21             | 0.000438              | 1.28               | 87.31                | 26.87             | 0.13         |
| Reach 1 | 2917      | 10 YR   | 217.00           | 56.19             | 63.02             |                   | 63.06             | 0.000431              | 1.53               | 142.03               | 32.78             | 0.13         |
| Reach 1 | 2917      | 25 YR   | 294.00           | 56.19             | 64.04             |                   | 64.08             | 0.000434              | 1.66               | 176.98               | 36.06             | 0.13         |
| Reach 1 | 2917      | 50 YR   | 362.00           | 56.19             | 64.81             |                   | 64.86             | 0.000423              | 1.76               | 207.94               | 45.64             | 0.13         |
| Reach 1 | 2917      | 100 YR  | 438.00           | 56.19             | 65.53             |                   | 65.58             | 0.000422              | 1.87               | 244.76               | 56.50             | 0.13         |
| Reach 1 | 3438      | 2 YR    | 112.00           | 55.93             | 61.28             |                   | 61.29             | 0.000068              | 0.58               | 191.48               | 49.98             | 0.05         |
| Reach 1 | 3438      | 10 YR   | 217.00           | 55.93             | 63.13             |                   | 63.14             | 0.000078              | 0.74               | 291.42               | 58.09             | 0.06         |
| Reach 1 | 3438      | 25 YR   | 294.00           | 55.93             | 64.15             |                   | 64.17             | 0.000082              | 0.83               | 357.82               | 83.24             | 0.06         |
| Reach 1 | 3438      | 50 YR   | 362.00           | 55.93             | 64.93             |                   | 64.94             | 0.000083              | 0.90               | 424.95               | 89.79             | 0.06         |
| Reach 1 | 3438      | 100 YR  | 438.00           | 55.93             | 65.66             |                   | 65.67             | 0.000085              | 0.96               | 492.63               | 96.41             | 0.06         |
| Reach 1 | 3919      | 2 YR    | 112.00           | 56.65             | 61.34             |                   | 61.38             | 0.000826              | 1.63               | 68.80                | 23.81             | 0.17         |
| Reach 1 | 3919      | 10 YR   | 217.00           | 56.65             | 63.19             |                   | 63.24             | 0.000705              | 1.82               | 119.15               | 30.63             | 0.16         |
| Reach 1 | 3919      | 25 YR   | 294.00           | 56.65             | 64.21             |                   | 64.27             | 0.000668              | 1.93               | 152.40               | 34.39             | 0.16         |
| Reach 1 | 3919      | 50 YR   | 362.00           | 56.65             | 64.98             |                   | 65.04             | 0.000626              | 2.01               | 180.28               | 38.06             | 0.16         |
| Reach 1 | 3919      | 100 YR  | 438.00           | 56.65             | 65.71             |                   | 65.78             | 0.000601              | 2.12               | 209.30               | 42.06             | 0.16         |
| Reach 1 | 4360      | 2 YR    | 112.00           | 56.95             | 61.75             |                   | 61.81             | 0.001166              | 1.94               | 57.69                | 18.92             | 0.20         |
| Reach 1 | 4360      | 10 YR   | 217.00           | 56.95             | 63.55             |                   | 63.63             | 0.001109              | 2.26               | 96.17                | 23.89             | 0.20         |
| Reach 1 | 4360      | 25 YR   | 294.00           | 56.95             | 64.56             |                   | 64.65             | 0.001088              | 2.42               | 121.57               | 26.67             | 0.20         |
| Reach 1 | 4360      | 50 YR   | 362.00           | 56.95             | 65.31             |                   | 65.41             | 0.001078              | 2.54               | 142.52               | 28.76             | 0.20         |
| Reach 1 | 4360      | 100 YR  | 438.00           | 56.95             | 66.02             |                   | 66.13             | 0.001070              | 2.67               | 167.69               | 56.01             | 0.20         |

**SECONDARY SYSTEM  
EXISTING CONDITIONS:  
HEC-RAS OUTPUT**

# EVANS LIVE OAK SECONDARY SYSTEM

HEC-RAS Plan: Existing River: Evans Reach: Downstream

| Reach      | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Downstream | 173       | 2 YEAR   | 24.30            | 49.69             | 58.22             | 50.53             | 58.22             | 0.000003              | 0.14               | 330.75               | 245.68            | 0.01         |
| Downstream | 173       | 10 YEAR  | 49.10            | 49.69             | 59.24             | 50.99             | 59.24             | 0.000003              | 0.17               | 635.27               | 351.00            | 0.01         |
| Downstream | 173       | 25 YEAR  | 67.20            | 49.69             | 59.72             | 51.27             | 59.72             | 0.000003              | 0.18               | 815.96               | 401.99            | 0.01         |
| Downstream | 173       | 50 YEAR  | 83.30            | 49.69             | 60.09             | 51.48             | 60.09             | 0.000004              | 0.20               | 995.92               | 708.47            | 0.01         |
| Downstream | 173       | 100 YEAR | 101.30           | 49.69             | 60.43             | 51.69             | 60.43             | 0.000003              | 0.19               | 1239.18              | 722.43            | 0.01         |
| Downstream | 390       | 2 YEAR   | 24.30            | 51.00             | 58.22             |                   | 58.22             | 0.000010              | 0.22               | 120.84               | 69.97             | 0.02         |
| Downstream | 390       | 10 YEAR  | 49.10            | 51.00             | 59.24             |                   | 59.24             | 0.000017              | 0.29               | 231.17               | 156.69            | 0.02         |
| Downstream | 390       | 25 YEAR  | 67.20            | 51.00             | 59.72             |                   | 59.72             | 0.000019              | 0.32               | 320.17               | 250.81            | 0.02         |
| Downstream | 390       | 50 YEAR  | 83.30            | 51.00             | 60.09             |                   | 60.09             | 0.000019              | 0.33               | 446.55               | 572.09            | 0.02         |
| Downstream | 390       | 100 YEAR | 101.30           | 51.00             | 60.43             |                   | 60.43             | 0.000012              | 0.27               | 655.01               | 638.42            | 0.02         |
| Downstream | 486       | 2 YEAR   | 24.30            | 54.06             | 58.22             | 54.59             | 58.22             | 0.000071              | 0.42               | 57.69                | 16.72             | 0.04         |
| Downstream | 486       | 10 YEAR  | 49.10            | 54.06             | 59.24             | 54.90             | 59.25             | 0.000138              | 0.65               | 75.45                | 18.12             | 0.06         |
| Downstream | 486       | 25 YEAR  | 67.20            | 54.06             | 59.72             | 55.09             | 59.73             | 0.000190              | 0.80               | 84.30                | 18.78             | 0.07         |
| Downstream | 486       | 50 YEAR  | 83.30            | 54.06             | 60.09             | 55.24             | 60.10             | 0.000234              | 0.91               | 91.32                | 19.29             | 0.07         |
| Downstream | 486       | 100 YEAR | 101.30           | 54.06             | 60.43             | 55.40             | 60.44             | 0.000287              | 1.03               | 97.89                | 19.75             | 0.08         |
| Downstream | 516       |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Downstream | 544       | 2 YEAR   | 24.30            | 54.00             | 59.93             | 54.53             | 59.93             | 0.000017              | 0.27               | 89.37                | 19.15             | 0.02         |
| Downstream | 544       | 10 YEAR  | 49.10            | 54.00             | 60.95             | 54.83             | 60.95             | 0.000041              | 0.45               | 109.59               | 20.55             | 0.03         |
| Downstream | 544       | 25 YEAR  | 67.20            | 54.00             | 61.57             | 55.03             | 61.58             | 0.000058              | 0.55               | 122.77               | 21.42             | 0.04         |
| Downstream | 544       | 50 YEAR  | 83.30            | 54.00             | 62.10             | 55.19             | 62.10             | 0.000069              | 0.62               | 134.61               | 35.78             | 0.04         |
| Downstream | 544       | 100 YEAR | 101.30           | 54.00             | 62.66             | 55.34             | 62.66             | 0.000075              | 0.68               | 151.29               | 70.88             | 0.05         |
| Downstream | 576       | 2 YEAR   | 24.30            | 53.21             | 59.93             |                   | 59.93             | 0.000013              | 0.24               | 101.49               | 19.21             | 0.02         |
| Downstream | 576       | 10 YEAR  | 49.10            | 53.21             | 60.95             |                   | 60.95             | 0.000033              | 0.40               | 121.72               | 20.46             | 0.03         |
| Downstream | 576       | 25 YEAR  | 67.20            | 53.21             | 61.58             |                   | 61.58             | 0.000047              | 0.50               | 134.83               | 21.23             | 0.03         |
| Downstream | 576       | 50 YEAR  | 83.30            | 53.21             | 62.10             |                   | 62.10             | 0.000058              | 0.57               | 146.06               | 21.86             | 0.04         |
| Downstream | 576       | 100 YEAR | 101.30           | 53.21             | 62.66             |                   | 62.67             | 0.000065              | 0.63               | 171.35               | 66.29             | 0.04         |
| Downstream | 772       | 2 YEAR   | 16.20            | 56.00             | 59.93             |                   | 59.93             | 0.000036              | 0.36               | 45.59                | 15.69             | 0.04         |
| Downstream | 772       | 10 YEAR  | 32.70            | 56.00             | 60.96             |                   | 60.96             | 0.000061              | 0.52               | 62.75                | 17.82             | 0.05         |
| Downstream | 772       | 25 YEAR  | 44.80            | 56.00             | 61.59             |                   | 61.59             | 0.000072              | 0.60               | 74.42                | 19.14             | 0.05         |
| Downstream | 772       | 50 YEAR  | 55.50            | 56.00             | 62.11             |                   | 62.12             | 0.000076              | 0.65               | 88.08                | 57.22             | 0.06         |
| Downstream | 772       | 100 YEAR | 67.50            | 56.00             | 62.67             |                   | 62.68             | 0.000064              | 0.65               | 135.31               | 99.94             | 0.05         |
| Downstream | 1045      | 2 YEAR   | 16.20            | 56.00             | 59.94             |                   | 59.94             | 0.000039              | 0.36               | 44.56                | 16.11             | 0.04         |
| Downstream | 1045      | 10 YEAR  | 32.70            | 56.00             | 60.97             |                   | 60.98             | 0.000063              | 0.52               | 62.46                | 18.62             | 0.05         |
| Downstream | 1045      | 25 YEAR  | 44.80            | 56.00             | 61.61             |                   | 61.61             | 0.000073              | 0.60               | 74.76                | 20.17             | 0.05         |

HEC-RAS Plan: Existing River: Evans Reach: Downstream (Continued)

| Reach      | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|------------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Downstream | 1045      | 50 YEAR  | 55.50            | 56.00             | 62.13             |                   | 62.14             | 0.000078              | 0.65               | 85.67                | 21.45             | 0.06         |
| Downstream | 1045      | 100 YEAR | 67.50            | 56.00             | 62.69             |                   | 62.70             | 0.000080              | 0.69               | 98.06                | 22.81             | 0.06         |
| Downstream | 1652      | 2 YEAR   | 8.10             | 60.23             | 60.60             | 60.60             | 60.78             | 0.043901              | 3.34               | 2.43                 | 7.00              | 1.00         |
| Downstream | 1652      | 10 YEAR  | 16.40            | 60.23             | 60.94             |                   | 61.11             | 0.020577              | 3.33               | 4.93                 | 7.89              | 0.74         |
| Downstream | 1652      | 25 YEAR  | 22.40            | 60.23             | 61.65             |                   | 61.72             | 0.003420              | 1.99               | 11.25                | 9.80              | 0.33         |
| Downstream | 1652      | 50 YEAR  | 27.80            | 60.23             | 62.19             |                   | 62.24             | 0.001661              | 1.64               | 16.92                | 11.24             | 0.24         |
| Downstream | 1652      | 100 YEAR | 33.80            | 60.23             | 62.76             |                   | 62.79             | 0.000964              | 1.43               | 23.69                | 12.74             | 0.18         |

# EVANS UPSTREAM SECONDARY SYSTEM

HEC-RAS Plan: Existing River: Evans Reach: Upstream

| Reach    | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|----------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upstream | 260       | 2 YEAR   | 83.00            | 54.00             | 59.05             | 55.62             | 59.08             | 0.000352              | 1.38               | 60.05                | 17.78             | 0.13         |
| Upstream | 260       | 10 YEAR  | 175.00           | 54.00             | 60.06             | 56.50             | 60.13             | 0.000731              | 2.20               | 86.66                | 155.90            | 0.19         |
| Upstream | 260       | 25 YEAR  | 242.00           | 54.00             | 60.51             | 57.01             | 60.58             | 0.000697              | 2.31               | 196.24               | 333.70            | 0.19         |
| Upstream | 260       | 50 YEAR  | 302.00           | 54.00             | 60.84             | 57.40             | 60.89             | 0.000549              | 2.15               | 328.17               | 449.48            | 0.17         |
| Upstream | 260       | 100 YEAR | 369.00           | 54.00             | 61.17             | 57.80             | 61.20             | 0.000388              | 1.89               | 482.75               | 487.37            | 0.15         |
| Upstream | 442       | 2 YEAR   | 83.00            | 54.00             | 59.11             | 55.62             | 59.14             | 0.000335              | 1.36               | 61.19                | 17.93             | 0.13         |
| Upstream | 442       | 10 YEAR  | 175.00           | 54.00             | 60.19             | 56.51             | 60.26             | 0.000654              | 2.13               | 86.32                | 67.83             | 0.19         |
| Upstream | 442       | 25 YEAR  | 242.00           | 54.00             | 60.63             | 57.02             | 60.73             | 0.000828              | 2.56               | 109.52               | 109.57            | 0.21         |
| Upstream | 442       | 50 YEAR  | 302.00           | 54.00             | 60.93             | 57.42             | 61.06             | 0.000970              | 2.89               | 126.64               | 138.58            | 0.23         |
| Upstream | 442       | 100 YEAR | 369.00           | 54.00             | 61.23             | 57.81             | 61.34             | 0.000891              | 2.89               | 211.72               | 167.64            | 0.22         |
| Upstream | 535       |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upstream | 630       | 2 YEAR   | 83.00            | 53.16             | 59.29             | 54.55             | 59.30             | 0.000143              | 0.90               | 91.90                | 22.00             | 0.08         |
| Upstream | 630       | 10 YEAR  | 175.00           | 53.16             | 60.74             | 55.36             | 60.77             | 0.000250              | 1.38               | 132.66               | 56.16             | 0.11         |
| Upstream | 630       | 25 YEAR  | 242.00           | 53.16             | 61.71             | 55.83             | 61.75             | 0.000252              | 1.55               | 171.62               | 96.15             | 0.11         |
| Upstream | 630       | 50 YEAR  | 302.00           | 53.16             | 62.22             | 56.20             | 62.27             | 0.000290              | 1.76               | 192.15               | 122.85            | 0.12         |
| Upstream | 630       | 100 YEAR | 369.00           | 53.16             | 62.62             | 56.57             | 62.66             | 0.000294              | 1.84               | 279.47               | 145.12            | 0.12         |
| Upstream | 740       | 2 YEAR   | 83.00            | 53.16             | 59.30             |                   | 59.31             | 0.000142              | 0.90               | 92.24                | 22.04             | 0.08         |
| Upstream | 740       | 10 YEAR  | 175.00           | 53.16             | 60.76             |                   | 60.79             | 0.000244              | 1.37               | 137.74               | 57.31             | 0.10         |
| Upstream | 740       | 25 YEAR  | 242.00           | 53.16             | 61.74             |                   | 61.77             | 0.000226              | 1.48               | 213.54               | 97.48             | 0.10         |
| Upstream | 740       | 50 YEAR  | 302.00           | 53.16             | 62.27             |                   | 62.30             | 0.000240              | 1.60               | 271.42               | 125.26            | 0.11         |
| Upstream | 740       | 100 YEAR | 369.00           | 53.16             | 62.65             |                   | 62.69             | 0.000267              | 1.76               | 324.40               | 147.28            | 0.12         |
| Upstream | 1050      | 2 YEAR   | 64.00            | 53.00             | 59.34             |                   | 59.35             | 0.000110              | 0.77               | 82.61                | 19.54             | 0.07         |
| Upstream | 1050      | 10 YEAR  | 134.00           | 53.00             | 60.84             |                   | 60.86             | 0.000203              | 1.17               | 114.17               | 22.62             | 0.09         |
| Upstream | 1050      | 25 YEAR  | 186.00           | 53.00             | 61.82             |                   | 61.85             | 0.000240              | 1.36               | 137.22               | 24.62             | 0.10         |
| Upstream | 1050      | 50 YEAR  | 232.00           | 53.00             | 62.34             |                   | 62.38             | 0.000279              | 1.54               | 157.11               | 50.97             | 0.11         |
| Upstream | 1050      | 100 YEAR | 282.00           | 53.00             | 62.74             |                   | 62.79             | 0.000324              | 1.73               | 180.21               | 65.53             | 0.12         |
| Upstream | 1266      | 2 YEAR   | 64.00            | 53.72             | 59.37             |                   | 59.39             | 0.000292              | 1.13               | 56.49                | 12.49             | 0.09         |
| Upstream | 1266      | 10 YEAR  | 134.00           | 53.72             | 60.89             |                   | 60.94             | 0.000573              | 1.75               | 76.46                | 13.83             | 0.13         |
| Upstream | 1266      | 25 YEAR  | 186.00           | 53.72             | 61.87             |                   | 61.94             | 0.000710              | 2.06               | 90.46                | 14.69             | 0.15         |
| Upstream | 1266      | 50 YEAR  | 232.00           | 53.72             | 62.40             |                   | 62.49             | 0.000867              | 2.36               | 99.30                | 24.77             | 0.16         |
| Upstream | 1266      | 100 YEAR | 282.00           | 53.72             | 62.81             |                   | 62.92             | 0.001031              | 2.67               | 113.57               | 46.08             | 0.18         |

HEC-RAS Plan: Existing River: Evans Reach: Upstream (Continued)

| Reach    | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|----------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upstream | 1600      | 2 YEAR   | 64.00            | 53.50             | 59.45             | 54.71             | 59.46             | 0.000151              | 0.88               | 72.46                | 16.35             | 0.07         |
| Upstream | 1600      | 10 YEAR  | 134.00           | 53.50             | 61.05             | 55.44             | 61.07             | 0.000277              | 1.34               | 100.31               | 18.59             | 0.10         |
| Upstream | 1600      | 25 YEAR  | 186.00           | 53.50             | 62.07             | 55.88             | 62.10             | 0.000331              | 1.55               | 120.01               | 20.03             | 0.11         |
| Upstream | 1600      | 50 YEAR  | 232.00           | 53.50             | 62.64             | 56.23             | 62.69             | 0.000402              | 1.76               | 131.84               | 20.85             | 0.12         |
| Upstream | 1600      | 100 YEAR | 282.00           | 53.50             | 63.10             | 56.57             | 63.16             | 0.000492              | 1.99               | 141.49               | 21.49             | 0.14         |
| Upstream | 1716      |          | Culvert          |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Upstream | 1764      | 2 YEAR   | 64.00            | 54.00             | 60.45             | 55.29             | 60.46             | 0.000070              | 0.71               | 89.71                | 20.80             | 0.06         |
| Upstream | 1764      | 10 YEAR  | 134.00           | 54.00             | 61.63             | 56.01             | 61.65             | 0.000157              | 1.16               | 115.57               | 23.30             | 0.09         |
| Upstream | 1764      | 25 YEAR  | 186.00           | 54.00             | 62.85             | 56.45             | 62.88             | 0.000155              | 1.28               | 148.36               | 32.00             | 0.09         |
| Upstream | 1764      | 50 YEAR  | 232.00           | 54.00             | 63.87             | 56.80             | 63.90             | 0.000143              | 1.33               | 185.74               | 41.52             | 0.09         |
| Upstream | 1764      | 100 YEAR | 282.00           | 54.00             | 64.93             | 57.13             | 64.96             | 0.000122              | 1.35               | 230.59               | 148.17            | 0.09         |
| Upstream | 1989      | 2 YEAR   | 64.00            | 54.00             | 60.47             |                   | 60.48             | 0.000062              | 0.67               | 95.01                | 22.37             | 0.06         |
| Upstream | 1989      | 10 YEAR  | 134.00           | 54.00             | 61.66             |                   | 61.68             | 0.000134              | 1.09               | 123.38               | 25.20             | 0.09         |
| Upstream | 1989      | 25 YEAR  | 186.00           | 54.00             | 62.89             |                   | 62.91             | 0.000122              | 1.18               | 170.23               | 51.54             | 0.09         |
| Upstream | 1989      | 50 YEAR  | 232.00           | 54.00             | 63.91             |                   | 63.93             | 0.000103              | 1.20               | 232.69               | 71.30             | 0.08         |
| Upstream | 1989      | 100 YEAR | 282.00           | 54.00             | 64.96             |                   | 64.98             | 0.000079              | 1.16               | 374.71               | 194.01            | 0.07         |
| Upstream | 2295      | 2 YEAR   | 64.00            | 56.17             | 60.50             |                   | 60.52             | 0.000307              | 1.21               | 52.84                | 17.93             | 0.12         |
| Upstream | 2295      | 10 YEAR  | 134.00           | 56.17             | 61.71             |                   | 61.76             | 0.000494              | 1.75               | 76.65                | 21.15             | 0.16         |
| Upstream | 2295      | 25 YEAR  | 186.00           | 56.17             | 62.93             |                   | 62.98             | 0.000415              | 1.78               | 104.41               | 24.37             | 0.15         |
| Upstream | 2295      | 50 YEAR  | 232.00           | 56.17             | 63.94             |                   | 63.99             | 0.000316              | 1.76               | 146.65               | 75.68             | 0.14         |
| Upstream | 2295      | 100 YEAR | 282.00           | 56.17             | 64.99             |                   | 65.02             | 0.000196              | 1.57               | 281.45               | 181.66            | 0.11         |
| Upstream | 2434      | 2 YEAR   | 64.00            | 56.00             | 60.54             |                   | 60.56             | 0.000321              | 1.25               | 51.26                | 16.59             | 0.13         |
| Upstream | 2434      | 10 YEAR  | 134.00           | 56.00             | 61.78             |                   | 61.83             | 0.000530              | 1.82               | 73.70                | 19.49             | 0.16         |
| Upstream | 2434      | 25 YEAR  | 186.00           | 56.00             | 62.99             |                   | 63.04             | 0.000355              | 1.77               | 133.91               | 71.62             | 0.14         |
| Upstream | 2434      | 50 YEAR  | 232.00           | 56.00             | 63.99             |                   | 64.03             | 0.000224              | 1.59               | 221.12               | 102.18            | 0.12         |
| Upstream | 2434      | 100 YEAR | 282.00           | 56.00             | 65.02             |                   | 65.05             | 0.000141              | 1.40               | 365.83               | 181.51            | 0.09         |
| Upstream | 2851      | 2 YEAR   | 43.00            | 58.00             | 60.73             |                   | 60.81             | 0.001891              | 2.23               | 19.24                | 9.10              | 0.27         |
| Upstream | 2851      | 10 YEAR  | 79.00            | 58.00             | 62.06             |                   | 62.15             | 0.001519              | 2.42               | 32.68                | 11.09             | 0.25         |
| Upstream | 2851      | 25 YEAR  | 105.00           | 58.00             | 63.17             |                   | 63.25             | 0.001081              | 2.29               | 45.93                | 12.76             | 0.21         |
| Upstream | 2851      | 50 YEAR  | 127.00           | 58.00             | 64.10             |                   | 64.17             | 0.000820              | 2.17               | 58.98                | 25.54             | 0.19         |
| Upstream | 2851      | 100 YEAR | 152.00           | 58.00             | 65.09             |                   | 65.13             | 0.000418              | 1.79               | 138.78               | 133.77            | 0.14         |



HEC-RAS Plan: Existing River: Evans Reach: Upstream (Continued)

| Reach    | River Sta | Profile  | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|----------|-----------|----------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Upstream | 2980      | 2 YEAR   | 43.00            | 59.00             | 61.05             |                   | 61.21             | 0.005008              | 3.17               | 13.55                | 8.22              | 0.44         |
| Upstream | 2980      | 10 YEAR  | 79.00            | 59.00             | 62.29             |                   | 62.45             | 0.003160              | 3.17               | 24.95                | 10.17             | 0.36         |
| Upstream | 2980      | 25 YEAR  | 105.00           | 59.00             | 63.33             |                   | 63.45             | 0.002030              | 2.89               | 36.32                | 11.80             | 0.29         |
| Upstream | 2980      | 50 YEAR  | 127.00           | 59.00             | 64.21             |                   | 64.32             | 0.001458              | 2.68               | 47.40                | 13.19             | 0.25         |
| Upstream | 2980      | 100 YEAR | 152.00           | 59.00             | 65.13             |                   | 65.23             | 0.001105              | 2.52               | 60.22                | 14.64             | 0.22         |

**SECONDARY SYSTEM  
EXISTING CONDITIONS:  
SWMM INPUT**

Project: Greenville Master Plan

Location: Corey Road

Prepared by : SMB

Checked by: DJK

Date: June 2015

| <b>SWMM Sub-Basin ID</b> | <b>Curve Number</b> | <b>Area (acres)</b> | <b>Area (sq. ft.)</b> | <b>Width (ft.)</b> | <b>Basin Slope (%)</b> |
|--------------------------|---------------------|---------------------|-----------------------|--------------------|------------------------|
| BAS_FSUT030029           | 98                  | 0.07                | 3,049                 | 30                 | 0.50                   |
| BAS_FSUT030032           | 83                  | 2.65                | 115,434               | 170                | 0.30                   |
| BAS_FSUT030035           | 85                  | 0.21                | 9,148                 | 59                 | 0.70                   |
| BAS_FSUT030038           | 83                  | 1.11                | 48,352                | 176                | 1.14                   |
| BAS_FSUT030039           | 83                  | 1.19                | 51,836                | 160                | 1.20                   |
| BAS_FSUT030041           | 85                  | 1.08                | 47,045                | 142                | 0.70                   |
| BAS_FSUT030042           | 83                  | 1.35                | 58,806                | 116                | 1.20                   |
| BAS_FSUT030043           | 83                  | 0.42                | 18,295                | 75                 | 1.20                   |
| BAS_FSUT030045           | 83                  | 0.50                | 21,780                | 166                | 1.20                   |
| BAS_FSUT030046           | 83                  | 0.18                | 7,841                 | 79                 | 0.80                   |
| BAS_FSUT030047           | 83                  | 0.28                | 12,197                | 93                 | 0.80                   |
| BAS_FSUT030048           | 83                  | 3.72                | 162,043               | 157                | 1.50                   |
| BAS_FSUT030050           | 83                  | 10.27               | 447,361               | 532                | 0.67                   |
| BAS_FSUT030052           | 83                  | 3.73                | 162,479               | 361                | 0.85                   |
| BAS_FSUT030855           | 83                  | 0.70                | 30,492                | 100                | 0.33                   |

**SECONDARY SYSTEM  
EXISTING CONDITIONS:  
SWMM OUTPUT**

# Existing Conditions: Corey Road System (10-Year)

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

Existing Conditions: Corey Road System (10-Year)  
 Starting WSEL from HEC-RAS - Fork Swamp UT3 Model - Reach 3 (XS 1948)  
 10 yr = 53.84'

\*\*\*\*\*  
 NOTE: The summary statistics displayed in this report are  
 based on results found at every computational time step,  
 not just on results from each reporting time step.  
 \*\*\*\*\*

\*\*\*\*\*  
 Analysis Options  
 \*\*\*\*\*  
 Flow Units ..... CFS  
 Process Models:  
   Rainfall/Runoff ..... YES  
   Snowmelt ..... NO  
   Groundwater ..... NO  
   Flow Routing ..... YES  
   Ponding Allowed ..... NO  
   Water Quality ..... NO  
 Infiltration Method ..... CURVE\_NUMBER  
 Flow Routing Method ..... DYNWAVE  
 Starting Date ..... MAY-20-2010 00:00:00  
 Ending Date ..... MAY-21-2010 00:00:00  
 Antecedent Dry Days ..... 0.0  
 Report Time Step ..... 00:15:00  
 Wet Time Step ..... 00:10:00  
 Dry Time Step ..... 00:10:00  
 Routing Time Step ..... 10.00 sec

WARNING 04: minimum elevation drop used for Conduit 84\_OVERLAND

WARNING 02: maximum depth increased for Node FSUT030034

| *****                      | Volume    | Depth  |
|----------------------------|-----------|--------|
| Runoff Quantity Continuity | acre-feet | inches |
| *****                      | -----     | -----  |
| Total Precipitation .....  | 13.300    | 5.812  |
| Evaporation Loss .....     | 0.000     | 0.000  |
| Infiltration Loss .....    | 3.117     | 1.362  |
| Surface Runoff .....       | 9.856     | 4.307  |
| Final Surface Storage .... | 0.353     | 0.154  |
| Continuity Error (%) ..... | -0.200    |        |

| *****                      | Volume    | Volume   |
|----------------------------|-----------|----------|
| Flow Routing Continuity    | acre-feet | 10^6 gal |
| *****                      | -----     | -----    |
| Dry Weather Inflow .....   | 0.000     | 0.000    |
| Wet Weather Inflow .....   | 9.832     | 3.204    |
| Groundwater Inflow .....   | 0.000     | 0.000    |
| RDII Inflow .....          | 0.000     | 0.000    |
| External Inflow .....      | 0.480     | 0.156    |
| External Outflow .....     | 9.911     | 3.230    |
| Internal Outflow .....     | 0.000     | 0.000    |
| Storage Losses .....       | 0.000     | 0.000    |
| Initial Stored Volume .... | 0.024     | 0.008    |
| Final Stored Volume .....  | 0.259     | 0.084    |
| Continuity Error (%) ..... | 1.604     |          |

\*\*\*\*\*  
 Highest Continuity Errors  
 \*\*\*\*\*  
 Node FSUT030854 (1.60%)

\*\*\*\*\*  
 Time-Step Critical Elements

# Existing Conditions: Corey Road System (10-Year)

\*\*\*\*\*  
 Link 58\_EX36RCP (32.14%)  
 Link 44\_EX15RCP (4.41%)  
 Link 46\_EX24CMP (2.68%)  
 Link 50\_EX48RCP (1.28%)

\*\*\*\*\*  
 Highest Flow Instability Indexes  
 \*\*\*\*\*  
 Link 61\_EX36RCP (72)  
 Link 60\_EX36RCP (72)  
 Link 58\_EX36RCP (65)  
 Link 62\_EX36RCP (62)  
 Link 59\_EX15RCP (58)

\*\*\*\*\*  
 Routing Time Step Summary  
 \*\*\*\*\*  
 Minimum Time Step : 0.52 sec  
 Average Time Step : 8.38 sec  
 Maximum Time Step : 10.00 sec  
 Percent in Steady State : 0.00  
 Average Iterations per Step : 2.41

\*\*\*\*\*  
 Subcatchment Runoff Summary  
 \*\*\*\*\*

| Subcatchment   | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10^6 gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|----------------|-----------------------|----------------------|---------------------|----------------------|-----------------------|-----------------------------|-----------------------|-----------------|
| BAS_FSUT030052 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.16                  | 0.42                        | 7.96                  | 0.717           |
| BAS_FSUT030050 | 5.81                  | 0.00                 | 0.00                | 1.14                 | 4.54                  | 1.27                        | 22.32                 | 0.781           |
| BAS_FSUT030047 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.23                  | 0.03                        | 0.74                  | 0.727           |
| BAS_FSUT030048 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.12                  | 0.42                        | 6.57                  | 0.708           |
| BAS_FSUT030035 | 5.81                  | 0.00                 | 0.00                | 1.35                 | 4.38                  | 0.02                        | 0.56                  | 0.753           |
| BAS_FSUT030032 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.07                  | 0.29                        | 3.94                  | 0.700           |
| BAS_FSUT030855 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.16                  | 0.08                        | 1.46                  | 0.715           |
| BAS_FSUT030029 | 5.81                  | 0.00                 | 0.00                | 0.20                 | 5.55                  | 0.01                        | 0.22                  | 0.954           |
| BAS_FSUT030041 | 5.81                  | 0.00                 | 0.00                | 1.35                 | 4.34                  | 0.13                        | 2.53                  | 0.747           |
| BAS_FSUT030043 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.21                  | 0.05                        | 1.06                  | 0.724           |
| BAS_FSUT030039 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.20                  | 0.14                        | 2.86                  | 0.722           |
| BAS_FSUT030038 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.20                  | 0.13                        | 2.74                  | 0.723           |
| BAS_FSUT030042 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.17                  | 0.15                        | 2.92                  | 0.717           |
| BAS_FSUT030045 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.23                  | 0.06                        | 1.34                  | 0.728           |
| BAS_FSUT030046 | 5.81                  | 0.00                 | 0.00                | 1.51                 | 4.24                  | 0.02                        | 0.48                  | 0.729           |

\*\*\*\*\*  
 Node Depth Summary  
 \*\*\*\*\*

| Node       | Type     | Average<br>Depth<br>Feet | Maximum<br>Depth<br>Feet | Maximum<br>HGL<br>Feet | Time of Max<br>Occurrence<br>days hr:min |
|------------|----------|--------------------------|--------------------------|------------------------|--|
| FSUT030052 | JUNCTION | 0.34                     | 1.57                     | 63.11                  | 0 13:01                                  |
| FSUT030051 | JUNCTION | 0.15                     | 0.71                     | 61.83                  | 0 13:03                                  |
| FSUT030050 | JUNCTION | 0.57                     | 2.25                     | 56.78                  | 0 13:02                                  |
| FSUT030049 | JUNCTION | 1.13                     | 3.31                     | 56.27                  | 0 13:11                                  |
| FSUT030048 | JUNCTION | 2.05                     | 4.21                     | 56.23                  | 0 13:11                                  |
| FSUT030047 | JUNCTION | 0.06                     | 0.32                     | 57.60                  | 0 13:00                                  |
| FSUT030046 | JUNCTION | 0.11                     | 0.49                     | 57.49                  | 0 13:00                                  |
| FSUT030045 | JUNCTION | 0.15                     | 1.03                     | 57.30                  | 0 13:03                                  |
| FSUT030044 | JUNCTION | 0.13                     | 1.22                     | 57.25                  | 0 13:03                                  |
| FSUT030042 | JUNCTION | 0.34                     | 2.95                     | 57.15                  | 0 13:03                                  |
| FSUT030043 | JUNCTION | 0.17                     | 2.51                     | 57.16                  | 0 13:03                                  |
| FSUT030041 | JUNCTION | 0.27                     | 2.76                     | 57.15                  | 0 13:03                                  |
| FSUT030040 | JUNCTION | 0.28                     | 3.00                     | 56.94                  | 0 13:04                                  |

## Existing Conditions: Corey Road System (10-Year)

|            |          |      |      |       |   |       |
|------------|----------|------|------|-------|---|-------|
| FSUT030039 | JUNCTION | 0.59 | 3.38 | 56.90 | 0 | 13:03 |
| FSUT030038 | JUNCTION | 1.77 | 4.36 | 56.67 | 0 | 13:04 |
| FSUT030036 | JUNCTION | 2.32 | 4.11 | 55.82 | 0 | 13:10 |
| FSUT030037 | JUNCTION | 2.21 | 4.14 | 55.97 | 0 | 13:10 |
| FSUT030035 | JUNCTION | 1.74 | 3.32 | 55.58 | 0 | 13:10 |
| FSUT030034 | JUNCTION | 1.98 | 3.57 | 55.58 | 0 | 13:10 |
| FSUT030033 | JUNCTION | 1.73 | 3.05 | 55.26 | 0 | 13:10 |
| FSUT030032 | JUNCTION | 2.67 | 3.87 | 55.14 | 0 | 13:09 |
| FSUT030031 | JUNCTION | 2.92 | 3.89 | 54.89 | 0 | 13:10 |
| FSUT030855 | JUNCTION | 1.30 | 2.07 | 54.67 | 0 | 13:08 |
| FSUT030854 | JUNCTION | 1.45 | 2.20 | 54.65 | 0 | 13:09 |
| FSUT030030 | JUNCTION | 3.32 | 4.01 | 54.59 | 0 | 13:10 |
| FSUT030029 | JUNCTION | 3.30 | 3.82 | 54.39 | 0 | 13:10 |
| FSUT030028 | JUNCTION | 3.30 | 3.63 | 54.20 | 0 | 13:10 |
| FSUT030026 | OUTFALL  | 3.64 | 3.64 | 53.84 | 0 | 00:00 |

\*\*\*\*\*  
Node Inflow Summary  
\*\*\*\*\*

| Node       | Type     | Maximum Lateral Inflow CFS | Maximum Total Inflow CFS | Time of Max Occurrence days hr:min | Lateral Inflow Volume 10^6 gal | Total Inflow Volume 10^6 gal |
|------------|----------|----------------------------|--------------------------|------------------------------------|--------------------------------|------------------------------|
| FSUT030052 | JUNCTION | 7.95                       | 7.95                     | 0 12:59                            | 0.421                          | 0.421                        |
| FSUT030051 | JUNCTION | 0.00                       | 7.68                     | 0 13:01                            | 0.000                          | 0.421                        |
| FSUT030050 | JUNCTION | 22.31                      | 29.40                    | 0 12:59                            | 1.263                          | 1.683                        |
| FSUT030049 | JUNCTION | 0.00                       | 27.98                    | 0 13:01                            | 0.000                          | 1.685                        |
| FSUT030048 | JUNCTION | 6.56                       | 26.69                    | 0 13:09                            | 0.415                          | 2.117                        |
| FSUT030047 | JUNCTION | 0.74                       | 0.74                     | 0 12:59                            | 0.032                          | 0.032                        |
| FSUT030046 | JUNCTION | 0.48                       | 1.22                     | 0 12:59                            | 0.021                          | 0.053                        |
| FSUT030045 | JUNCTION | 1.34                       | 2.55                     | 0 12:59                            | 0.057                          | 0.110                        |
| FSUT030044 | JUNCTION | 0.00                       | 2.39                     | 0 12:57                            | 0.000                          | 0.110                        |
| FSUT030042 | JUNCTION | 2.92                       | 5.85                     | 0 12:59                            | 0.152                          | 0.310                        |
| FSUT030043 | JUNCTION | 1.06                       | 1.06                     | 0 12:59                            | 0.048                          | 0.048                        |
| FSUT030041 | JUNCTION | 2.53                       | 2.53                     | 0 12:59                            | 0.127                          | 0.127                        |
| FSUT030040 | JUNCTION | 0.00                       | 2.46                     | 0 13:00                            | 0.000                          | 0.127                        |
| FSUT030039 | JUNCTION | 2.86                       | 10.64                    | 0 12:59                            | 0.135                          | 0.578                        |
| FSUT030038 | JUNCTION | 2.74                       | 13.01                    | 0 13:00                            | 0.126                          | 0.716                        |
| FSUT030036 | JUNCTION | 0.00                       | 36.26                    | 0 13:08                            | 0.000                          | 2.866                        |
| FSUT030037 | JUNCTION | 0.00                       | 36.32                    | 0 13:08                            | 0.000                          | 2.851                        |
| FSUT030035 | JUNCTION | 0.56                       | 2.67                     | 0 00:05                            | 0.025                          | 0.027                        |
| FSUT030034 | JUNCTION | 0.00                       | 36.55                    | 0 13:08                            | 0.000                          | 2.907                        |
| FSUT030033 | JUNCTION | 0.00                       | 36.51                    | 0 13:09                            | 0.000                          | 2.920                        |
| FSUT030032 | JUNCTION | 3.94                       | 39.91                    | 0 13:09                            | 0.292                          | 3.231                        |
| FSUT030031 | JUNCTION | 0.00                       | 41.79                    | 0 00:02                            | 0.000                          | 3.248                        |
| FSUT030855 | JUNCTION | 1.46                       | 2.23                     | 0 00:03                            | 0.079                          | 0.080                        |
| FSUT030854 | JUNCTION | 0.00                       | 2.74                     | 0 00:03                            | 0.000                          | 0.084                        |
| FSUT030030 | JUNCTION | 0.00                       | 59.62                    | 0 00:01                            | 0.000                          | 3.348                        |
| FSUT030029 | JUNCTION | 0.22                       | 66.90                    | 0 00:01                            | 0.011                          | 3.369                        |
| FSUT030028 | JUNCTION | 0.00                       | 72.08                    | 0 00:00                            | 0.000                          | 3.385                        |
| FSUT030026 | OUTFALL  | 0.00                       | 72.08                    | 0 00:00                            | 0.000                          | 3.386                        |

\*\*\*\*\*  
Node Surcharge Summary  
\*\*\*\*\*

No nodes were surcharged.

\*\*\*\*\*  
Node Flooding Summary  
\*\*\*\*\*

No nodes were flooded.

\*\*\*\*\*  
Outfall Loading Summary  
\*\*\*\*\*

# Existing Conditions: Corey Road System (10-Year)

| Outfall Node | Flow Freq. Pcnt. | Avg. Flow CFS | Max. Flow CFS | Total Volume 10^6 gal |
|--------------|------------------|---------------|---------------|-----------------------|
| FSUT030026   | 99.97            | 6.95          | 72.08         | 3.386                 |
| System       | 99.97            | 6.95          | 72.08         | 3.386                 |

\*\*\*\*\*  
 Link Flow Summary  
 \*\*\*\*\*

| Link         | Type    | Maximum  Flow  CFS | Time of Max Occurrence days hr:min | Maximum  Veloc  ft/sec | Max/ Full Flow | Max/ Full Depth |
|--------------|---------|--------------------|------------------------------------|------------------------|----------------|-----------------|
| 36_EX15RCP   | CONDUIT | 0.74               | 0 13:00                            | 2.11                   | 0.11           | 0.33            |
| 37_EX15RCP   | CONDUIT | 1.21               | 0 13:00                            | 2.06                   | 0.33           | 0.60            |
| 38_EX18RCP   | CONDUIT | 2.39               | 0 12:57                            | 3.69                   | 0.36           | 0.75            |
| 39_EX18RCP   | CONDUIT | 2.34               | 0 12:52                            | 2.29                   | 0.24           | 0.91            |
| 40_EX15RCP   | CONDUIT | 0.99               | 0 13:00                            | 1.29                   | 0.11           | 1.00            |
| 41_EX24RCP   | CONDUIT | 5.64               | 0 13:03                            | 1.94                   | 0.54           | 1.00            |
| 42_EX15RCP   | CONDUIT | 2.46               | 0 13:00                            | 2.52                   | 0.66           | 1.00            |
| 43_EX18RCP   | CONDUIT | 2.37               | 0 13:00                            | 1.34                   | 0.22           | 1.00            |
| 44_EX24RCP   | CONDUIT | 10.40              | 0 13:02                            | 3.31                   | 0.21           | 1.00            |
| 44_EX15RCP   | CONDUIT | 5.07               | 0 12:51                            | 5.31                   | 1.10           | 0.78            |
| 45_EXCHANNEL | CONDUIT | 7.53               | 0 13:03                            | 1.14                   | 0.05           | 0.42            |
| 46_EX24CMP   | CONDUIT | 13.64              | 0 12:41                            | 4.47                   | 0.88           | 1.00            |
| 47_CHANNEL2  | CONDUIT | 20.29              | 0 13:29                            | 2.03                   | 0.36           | 1.00            |
| 48_EX24RCP   | CONDUIT | 12.85              | 0 13:01                            | 4.09                   | 1.07           | 1.00            |
| 49_EX42RCP   | CONDUIT | 26.80              | 0 13:17                            | 2.79                   | 0.83           | 1.00            |
| 50_EX48RCP   | CONDUIT | 36.26              | 0 13:08                            | 3.53                   | 0.37           | 1.00            |
| 51_EX48RCP   | CONDUIT | 36.23              | 0 13:08                            | 4.62                   | 0.61           | 0.95            |
| 52_EX15RCP   | CONDUIT | 2.67               | 0 00:05                            | 2.63                   | 0.52           | 1.00            |
| 53_EX48RCP   | CONDUIT | 36.51              | 0 13:09                            | 4.99                   | 0.72           | 0.83            |
| 54_EX48RCP   | CONDUIT | 36.52              | 0 13:11                            | 3.20                   | 0.19           | 0.87            |
| 56_EX15RCP   | CONDUIT | 2.23               | 0 00:03                            | 2.58                   | 0.47           | 1.00            |
| 57_EX48RCP   | CONDUIT | 39.90              | 0 13:10                            | 4.60                   | 0.53           | 0.97            |
| 58_EX36RCP   | CONDUIT | 41.79              | 0 00:02                            | 4.06                   | 0.61           | 1.00            |
| 59_EX15RCP   | CONDUIT | 2.74               | 0 00:03                            | 2.50                   | 0.39           | 1.00            |
| 60_EX36RCP   | CONDUIT | 59.62              | 0 00:01                            | 5.76                   | 6.19           | 1.00            |
| 61_EX36RCP   | CONDUIT | 66.90              | 0 00:01                            | 5.59                   | 2.21           | 1.00            |
| 62_EX36RCP   | CONDUIT | 72.08              | 0 00:00                            | 5.63                   | 1.09           | 1.00            |
| 62_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 63_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 64_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 65_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 66_OVERLAND  | CONDUIT | 2.64               | 0 13:01                            | 1.36                   | 0.00           | 0.02            |
| 68_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 69_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 70_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 71_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.03            |
| 72_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 73_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 74_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 75_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 76_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 77_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 80_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.02            |
| 81_OVERLAND  | CONDUIT | 18.73              | 0 13:02                            | 1.80                   | 0.00           | 0.17            |
| 82_OVERLAND  | CONDUIT | 11.98              | 0 13:10                            | 0.84                   | 0.00           | 0.12            |
| 83_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 84_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 85_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 86_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 87_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 88_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 89_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |
| 90_OVERLAND  | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00           | 0.00            |

\*\*\*\*\*



# Existing Conditions: Corey Road System (10-Year)

Flow Classification Summary  
\*\*\*\*\*

| Conduit       | Adjusted /Actual Length | --- Fraction of Dry | Up Dry | Down Dry | Time in Flow Sub Crit | Sup Crit | Class Up Crit | Down Crit | Avg. Froude Number | Avg. Flow Change |
|---------------|-------------------------|---------------------|--------|----------|-----------------------|----------|---------------|-----------|--------------------|------------------|
| 36_EX15RCP    | 4.61                    | 0.25                | 0.00   | 0.00     | 0.75                  | 0.00     | 0.00          | 0.00      | 0.51               | 0.0000           |
| 37_EX15RCP    | 1.00                    | 0.25                | 0.00   | 0.00     | 0.75                  | 0.00     | 0.00          | 0.00      | 0.38               | 0.0001           |
| 38_EX18RCP    | 1.85                    | 0.25                | 0.00   | 0.00     | 0.73                  | 0.01     | 0.00          | 0.00      | 0.67               | 0.0001           |
| 39_EX18RCP    | 1.00                    | 0.25                | 0.00   | 0.00     | 0.75                  | 0.00     | 0.00          | 0.00      | 0.34               | 0.0001           |
| 40_EX15RCP    | 5.46                    | 0.25                | 0.00   | 0.00     | 0.74                  | 0.00     | 0.00          | 0.00      | 0.22               | 0.0000           |
| 41_EX24RCP    | 1.00                    | 0.01                | 0.24   | 0.00     | 0.75                  | 0.00     | 0.00          | 0.00      | 0.24               | 0.0001           |
| 42_EX15RCP    | 1.00                    | 0.20                | 0.05   | 0.00     | 0.70                  | 0.06     | 0.00          | 0.00      | 0.58               | 0.0001           |
| 43_EX18RCP    | 3.29                    | 0.01                | 0.19   | 0.00     | 0.80                  | 0.00     | 0.00          | 0.00      | 0.17               | 0.0001           |
| 44_EX24RCP    | 9.54                    | 0.01                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00      | 0.07               | 0.0001           |
| 44_EX15RCP    | 1.22                    | 0.25                | 0.00   | 0.00     | 0.05                  | 0.70     | 0.00          | 0.00      | 1.00               | 0.0002           |
| 45_EXCHANNEL  | 1.00                    | 0.04                | 0.22   | 0.00     | 0.74                  | 0.00     | 0.00          | 0.00      | 0.11               | 0.0000           |
| 46_EX24CMP    | 1.33                    | 0.01                | 0.03   | 0.00     | 0.96                  | 0.00     | 0.00          | 0.00      | 0.32               | 0.0002           |
| 47_EXCHANNEL2 | 3.89                    | 0.01                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00      | 0.06               | 0.0002           |
| 48_EX24RCP    | 1.00                    | 0.01                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00      | 0.02               | 0.0005           |
| 49_EX42RCP    | 1.00                    | 0.01                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00      | 0.06               | 0.0004           |
| 50_EX48RCP    | 7.67                    | 0.00                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00      | 0.07               | 0.0002           |
| 51_EX48RCP    | 1.00                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.09               | 0.0003           |
| 52_EX15RCP    | 2.69                    | 0.00                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0005           |
| 53_EX48RCP    | 1.00                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.12               | 0.0003           |
| 54_EX48RCP    | 5.18                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.09               | 0.0001           |
| 56_EX15RCP    | 3.69                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0006           |
| 57_EX48RCP    | 1.76                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.06               | 0.0004           |
| 58_EX36RCP    | 1.00                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.01               | 0.0020           |
| 59_EX15RCP    | 1.00                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0009           |
| 60_EX36RCP    | 2.74                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0343           |
| 61_EX36RCP    | 4.39                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0097           |
| 62_EX36RCP    | 1.00                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0020           |
| 62_OVERLAND   | 9.40                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 63_OVERLAND   | 1.16                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 64_OVERLAND   | 3.04                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 65_OVERLAND   | 1.19                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 66_OVERLAND   | 3.49                    | 0.96                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.04      | 0.03               | 0.0000           |
| 68_OVERLAND   | 1.00                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 69_OVERLAND   | 1.17                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 70_OVERLAND   | 1.19                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 71_OVERLAND   | 1.04                    | 0.98                | 0.02   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 72_OVERLAND   | 1.00                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 73_OVERLAND   | 1.13                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 74_OVERLAND   | 5.37                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 75_OVERLAND   | 1.89                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 76_OVERLAND   | 1.25                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 77_OVERLAND   | 1.85                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 80_OVERLAND   | 1.00                    | 0.93                | 0.07   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 81_OVERLAND   | 4.39                    | 0.92                | 0.01   | 0.00     | 0.07                  | 0.00     | 0.00          | 0.00      | 0.02               | 0.0000           |
| 82_OVERLAND   | 10.95                   | 0.92                | 0.05   | 0.00     | 0.00                  | 0.00     | 0.03          | 0.00      | 0.00               | 0.0000           |
| 83_OVERLAND   | 9.08                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 84_OVERLAND   | 3.18                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 85_OVERLAND   | 8.03                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 86_OVERLAND   | 3.71                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 87_OVERLAND   | 6.96                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 88_OVERLAND   | 12.94                   | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 89_OVERLAND   | 8.65                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |
| 90_OVERLAND   | 8.55                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00      | 0.00               | 0.0000           |

\*\*\*\*\*  
Conduit Surcharge Summary  
\*\*\*\*\*

| Conduit    | ----- Both Ends | Hours Full Upstream | ----- Dnstream | Hours Above Full Normal Flow | Hours Capacity Limited |
|------------|-----------------|---------------------|----------------|------------------------------|------------------------|
| 40_EX15RCP | 0.66            | 0.66                | 0.67           | 0.01                         | 0.01                   |
| 41_EX24RCP | 0.51            | 0.51                | 0.51           | 0.01                         | 0.01                   |
| 42_EX15RCP | 0.85            | 0.85                | 0.85           | 0.01                         | 0.01                   |

## Existing Conditions: Corey Road System (10-Year)

|             |       |       |       |      |       |
|-------------|-------|-------|-------|------|-------|
| 43_EX18RCP  | 0.96  | 0.96  | 0.96  | 0.01 | 0.01  |
| 44_EX24RCP  | 0.88  | 0.88  | 0.88  | 0.01 | 0.01  |
| 44_EX15RCP  | 0.01  | 0.01  | 0.01  | 0.65 | 0.01  |
| 46_EX24CMP  | 1.24  | 1.24  | 1.24  | 0.01 | 0.03  |
| 47_CHANNEL2 | 1.48  | 1.48  | 1.48  | 0.01 | 0.01  |
| 48_EX24RCP  | 2.44  | 2.44  | 2.44  | 0.17 | 0.41  |
| 49_EX42RCP  | 0.73  | 0.73  | 0.74  | 0.01 | 0.62  |
| 50_EX48RCP  | 0.25  | 0.25  | 0.25  | 0.01 | 0.25  |
| 52_EX15RCP  | 23.82 | 23.82 | 23.83 | 0.01 | 0.01  |
| 56_EX15RCP  | 7.19  | 7.19  | 7.37  | 0.01 | 0.01  |
| 58_EX36RCP  | 2.03  | 2.03  | 2.03  | 0.57 | 0.01  |
| 59_EX15RCP  | 23.92 | 23.92 | 23.92 | 0.01 | 0.01  |
| 60_EX36RCP  | 23.94 | 23.94 | 23.95 | 6.24 | 12.39 |
| 61_EX36RCP  | 23.95 | 23.95 | 23.95 | 2.24 | 3.07  |
| 62_EX36RCP  | 23.96 | 23.96 | 23.96 | 0.75 | 0.01  |

Analysis begun on: Thu Jan 14 14:55:02 2016  
Analysis ended on: Thu Jan 14 14:55:03 2016  
Total elapsed time: 00:00:01

**SECONDARY SYSTEM  
ALTERNATIVE:  
SWMM OUTPUT**

# Alternative 1: Corey Road System (10-Year)

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

Alternative 1: Corey Road System (10-Year)  
 Starting WSEL from HEC-RAS - Fork Swamp UT3 Model - Reach 3 (XS 1948):  
 10 yr = 53.92'

\*\*\*\*\*  
 NOTE: The summary statistics displayed in this report are  
 based on results found at every computational time step,  
 not just on results from each reporting time step.  
 \*\*\*\*\*

\*\*\*\*\*  
 Analysis Options  
 \*\*\*\*\*  
 Flow Units ..... CFS  
 Process Models:  
   Rainfall/Runoff ..... YES  
   Snowmelt ..... NO  
   Groundwater ..... NO  
   Flow Routing ..... YES  
   Ponding Allowed ..... NO  
   Water Quality ..... NO  
 Infiltration Method ..... CURVE\_NUMBER  
 Flow Routing Method ..... DYNWAVE  
 Starting Date ..... MAY-20-2010 00:00:00  
 Ending Date ..... MAY-21-2010 00:00:00  
 Antecedent Dry Days ..... 0.0  
 Report Time Step ..... 00:15:00  
 Wet Time Step ..... 00:10:00  
 Dry Time Step ..... 00:10:00  
 Routing Time Step ..... 10.00 sec

WARNING 04: minimum elevation drop used for Conduit 84\_OVERLAND  
 WARNING 02: maximum depth increased for Node FSUT030050  
 WARNING 02: maximum depth increased for Node FSUT030034

| *****                      | Volume    | Depth  |
|----------------------------|-----------|--------|
| Runoff Quantity Continuity | acre-feet | inches |
| *****                      | -----     | -----  |
| Total Precipitation .....  | 13.300    | 5.812  |
| Evaporation Loss .....     | 0.000     | 0.000  |
| Infiltration Loss .....    | 3.117     | 1.362  |
| Surface Runoff .....       | 9.856     | 4.307  |
| Final Surface Storage .... | 0.353     | 0.154  |
| Continuity Error (%) ..... | -0.200    |        |

| *****                      | Volume    | Volume   |
|----------------------------|-----------|----------|
| Flow Routing Continuity    | acre-feet | 10^6 gal |
| *****                      | -----     | -----    |
| Dry Weather Inflow .....   | 0.000     | 0.000    |
| Wet Weather Inflow .....   | 9.832     | 3.204    |
| Groundwater Inflow .....   | 0.000     | 0.000    |
| RDII Inflow .....          | 0.000     | 0.000    |
| External Inflow .....      | 0.531     | 0.173    |
| External Outflow .....     | 9.927     | 3.235    |
| Internal Outflow .....     | 0.000     | 0.000    |
| Storage Losses .....       | 0.000     | 0.000    |
| Initial Stored Volume .... | 0.039     | 0.013    |
| Final Stored Volume .....  | 0.295     | 0.096    |
| Continuity Error (%) ..... | 1.735     |          |

\*\*\*\*\*  
 Highest Continuity Errors  
 \*\*\*\*\*  
 Node FSUT030854 (1.65%)

# Alternative 1: Corey Road System (10-Year)

\*\*\*\*\*

Time-Step Critical Elements

\*\*\*\*\*

Link 58\_EX36RCP (36.72%)  
 Link 62\_PROP\_TWIN\_48\_RCP (4.79%)  
 Link 50\_EX48RCP (3.35%)  
 Link 57\_EX48RCP (1.34%)  
 Link 49\_EX42RCP (1.29%)

\*\*\*\*\*

Highest Flow Instability Indexes

\*\*\*\*\*

Link 60\_EX36RCP (64)  
 Link 61\_EX36RCP (62)  
 Link 58\_EX36RCP (58)  
 Link 62\_PROP\_TWIN\_48\_RCP (50)  
 Link 59\_EX15RCP (49)

\*\*\*\*\*

Routing Time Step Summary

\*\*\*\*\*

Minimum Time Step : 0.51 sec  
 Average Time Step : 7.66 sec  
 Maximum Time Step : 10.00 sec  
 Percent in Steady State : 0.00  
 Average Iterations per Step : 2.29

\*\*\*\*\*

Subcatchment Runoff Summary

\*\*\*\*\*

| Subcatchment   | Total Precip<br>in | Total Runon<br>in | Total Evap<br>in | Total Infil<br>in | Total Runoff<br>in | Total Runoff<br>10 <sup>6</sup> gal | Peak Runoff<br>CFS | Runoff<br>Coeff |
|----------------|--------------------|-------------------|------------------|-------------------|--------------------|-------------------------------------|--------------------|-----------------|
| BAS_FSUT030029 | 5.81               | 0.00              | 0.00             | 0.20              | 5.55               | 0.01                                | 0.22               | 0.954           |
| BAS_FSUT030032 | 5.81               | 0.00              | 0.00             | 1.51              | 4.07               | 0.29                                | 3.94               | 0.700           |
| BAS_FSUT030035 | 5.81               | 0.00              | 0.00             | 1.35              | 4.38               | 0.02                                | 0.56               | 0.753           |
| BAS_FSUT030038 | 5.81               | 0.00              | 0.00             | 1.51              | 4.20               | 0.13                                | 2.74               | 0.723           |
| BAS_FSUT030039 | 5.81               | 0.00              | 0.00             | 1.51              | 4.20               | 0.14                                | 2.86               | 0.722           |
| BAS_FSUT030041 | 5.81               | 0.00              | 0.00             | 1.35              | 4.34               | 0.13                                | 2.53               | 0.747           |
| BAS_FSUT030042 | 5.81               | 0.00              | 0.00             | 1.51              | 4.17               | 0.15                                | 2.92               | 0.717           |
| BAS_FSUT030043 | 5.81               | 0.00              | 0.00             | 1.51              | 4.21               | 0.05                                | 1.06               | 0.724           |
| BAS_FSUT030045 | 5.81               | 0.00              | 0.00             | 1.51              | 4.23               | 0.06                                | 1.34               | 0.728           |
| BAS_FSUT030046 | 5.81               | 0.00              | 0.00             | 1.51              | 4.24               | 0.02                                | 0.48               | 0.729           |
| BAS_FSUT030047 | 5.81               | 0.00              | 0.00             | 1.51              | 4.23               | 0.03                                | 0.74               | 0.727           |
| BAS_FSUT030048 | 5.81               | 0.00              | 0.00             | 1.51              | 4.12               | 0.42                                | 6.57               | 0.708           |
| BAS_FSUT030050 | 5.81               | 0.00              | 0.00             | 1.14              | 4.54               | 1.27                                | 22.32              | 0.781           |
| BAS_FSUT030052 | 5.81               | 0.00              | 0.00             | 1.51              | 4.16               | 0.42                                | 7.96               | 0.717           |
| BAS_FSUT030855 | 5.81               | 0.00              | 0.00             | 1.51              | 4.16               | 0.08                                | 1.46               | 0.715           |

\*\*\*\*\*

Node Depth Summary

\*\*\*\*\*

| Node       | Type     | Average<br>Depth<br>Feet | Maximum<br>Depth<br>Feet | Maximum<br>HGL<br>Feet | Time of Max<br>Occurrence<br>days hr:min |
|------------|----------|--------------------------|--------------------------|------------------------|--|
| FSUT030052 | JUNCTION | 0.28                     | 1.21                     | 62.75                  | 0 13:00                                  |
| FSUT030051 | JUNCTION | 0.15                     | 0.71                     | 61.84                  | 0 13:01                                  |
| FSUT030050 | JUNCTION | 0.41                     | 2.29                     | 56.83                  | 0 13:07                                  |
| FSUT030049 | JUNCTION | 1.19                     | 3.26                     | 56.22                  | 0 13:12                                  |
| FSUT030048 | JUNCTION | 2.11                     | 4.12                     | 56.14                  | 0 13:11                                  |
| FSUT030047 | JUNCTION | 0.07                     | 0.32                     | 57.60                  | 0 13:00                                  |
| FSUT030046 | JUNCTION | 0.11                     | 0.49                     | 57.49                  | 0 13:00                                  |
| FSUT030045 | JUNCTION | 0.16                     | 1.12                     | 57.38                  | 0 13:02                                  |
| FSUT030044 | JUNCTION | 0.13                     | 1.31                     | 57.34                  | 0 13:02                                  |
| FSUT030042 | JUNCTION | 0.34                     | 3.04                     | 57.23                  | 0 13:02                                  |

## Alternative 1: Corey Road System (10-Year)

|            |          |      |      |       |   |       |
|------------|----------|------|------|-------|---|-------|
| FSUT030043 | JUNCTION | 0.17 | 2.59 | 57.24 | 0 | 13:02 |
| FSUT030041 | JUNCTION | 0.27 | 2.85 | 57.23 | 0 | 13:02 |
| FSUT030040 | JUNCTION | 0.28 | 3.07 | 57.00 | 0 | 13:02 |
| FSUT030039 | JUNCTION | 0.64 | 3.44 | 56.96 | 0 | 13:03 |
| FSUT030038 | JUNCTION | 1.83 | 4.40 | 56.71 | 0 | 13:03 |
| FSUT030036 | JUNCTION | 2.37 | 4.01 | 55.72 | 0 | 13:09 |
| FSUT030037 | JUNCTION | 2.27 | 4.05 | 55.88 | 0 | 13:08 |
| FSUT030035 | JUNCTION | 1.79 | 3.21 | 55.47 | 0 | 13:08 |
| FSUT030034 | JUNCTION | 2.04 | 3.46 | 55.47 | 0 | 13:09 |
| FSUT030033 | JUNCTION | 1.79 | 2.90 | 55.12 | 0 | 13:08 |
| FSUT030032 | JUNCTION | 2.73 | 3.72 | 54.99 | 0 | 13:08 |
| FSUT030031 | JUNCTION | 2.98 | 3.73 | 54.73 | 0 | 13:08 |
| FSUT030855 | JUNCTION | 1.36 | 1.93 | 54.53 | 0 | 13:03 |
| FSUT030854 | JUNCTION | 1.51 | 2.05 | 54.50 | 0 | 13:04 |
| FSUT030030 | JUNCTION | 3.38 | 3.85 | 54.43 | 0 | 13:08 |
| FSUT030029 | JUNCTION | 3.36 | 3.64 | 54.22 | 0 | 13:08 |
| FSUT030028 | JUNCTION | 3.36 | 3.50 | 54.06 | 0 | 00:04 |
| FSUT030026 | OUTFALL  | 3.72 | 3.72 | 53.92 | 0 | 00:00 |

\*\*\*\*\*  
Node Inflow Summary  
\*\*\*\*\*

| Node       | Type     | Maximum                  | Maximum                | Time of Max<br>Occurrence<br>days hr:min | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal |
|------------|----------|--------------------------|------------------------|--|---|---------------------------------------|
|            |          | Lateral<br>Inflow<br>CFS | Total<br>Inflow<br>CFS |  |   |                                       |
| FSUT030052 | JUNCTION | 7.95                     | 7.95                   | 0 13:00                                  | 0.421                                   | 0.421                                 |
| FSUT030051 | JUNCTION | 0.00                     | 7.94                   | 0 13:00                                  | 0.000                                   | 0.421                                 |
| FSUT030050 | JUNCTION | 22.30                    | 29.86                  | 0 13:00                                  | 1.263                                   | 1.683                                 |
| FSUT030049 | JUNCTION | 0.00                     | 24.31                  | 0 12:56                                  | 0.000                                   | 1.688                                 |
| FSUT030048 | JUNCTION | 6.56                     | 27.20                  | 0 13:22                                  | 0.415                                   | 2.120                                 |
| FSUT030047 | JUNCTION | 0.74                     | 0.74                   | 0 12:59                                  | 0.032                                   | 0.032                                 |
| FSUT030046 | JUNCTION | 0.48                     | 1.22                   | 0 13:00                                  | 0.021                                   | 0.053                                 |
| FSUT030045 | JUNCTION | 1.34                     | 2.55                   | 0 13:00                                  | 0.057                                   | 0.110                                 |
| FSUT030044 | JUNCTION | 0.00                     | 2.35                   | 0 12:55                                  | 0.000                                   | 0.110                                 |
| FSUT030042 | JUNCTION | 2.92                     | 5.89                   | 0 13:00                                  | 0.152                                   | 0.310                                 |
| FSUT030043 | JUNCTION | 1.06                     | 1.06                   | 0 13:00                                  | 0.048                                   | 0.048                                 |
| FSUT030041 | JUNCTION | 2.53                     | 2.53                   | 0 13:00                                  | 0.127                                   | 0.127                                 |
| FSUT030040 | JUNCTION | 0.00                     | 2.47                   | 0 13:00                                  | 0.000                                   | 0.127                                 |
| FSUT030039 | JUNCTION | 2.86                     | 10.77                  | 0 13:00                                  | 0.135                                   | 0.580                                 |
| FSUT030038 | JUNCTION | 2.74                     | 13.22                  | 0 13:01                                  | 0.126                                   | 0.719                                 |
| FSUT030036 | JUNCTION | 0.00                     | 36.53                  | 0 13:09                                  | 0.000                                   | 2.874                                 |
| FSUT030037 | JUNCTION | 0.00                     | 36.53                  | 0 13:08                                  | 0.000                                   | 2.859                                 |
| FSUT030035 | JUNCTION | 0.56                     | 3.11                   | 0 00:05                                  | 0.025                                   | 0.027                                 |
| FSUT030034 | JUNCTION | 0.00                     | 36.85                  | 0 13:09                                  | 0.000                                   | 2.917                                 |
| FSUT030033 | JUNCTION | 0.00                     | 36.85                  | 0 13:09                                  | 0.000                                   | 2.931                                 |
| FSUT030032 | JUNCTION | 3.94                     | 40.31                  | 0 13:09                                  | 0.292                                   | 3.243                                 |
| FSUT030031 | JUNCTION | 0.00                     | 52.54                  | 0 00:01                                  | 0.000                                   | 3.260                                 |
| FSUT030855 | JUNCTION | 1.45                     | 2.78                   | 0 00:03                                  | 0.079                                   | 0.080                                 |
| FSUT030854 | JUNCTION | 0.00                     | 3.34                   | 0 00:02                                  | 0.000                                   | 0.084                                 |
| FSUT030030 | JUNCTION | 0.00                     | 80.40                  | 0 00:01                                  | 0.000                                   | 3.361                                 |
| FSUT030029 | JUNCTION | 0.22                     | 89.76                  | 0 00:01                                  | 0.011                                   | 3.382                                 |
| FSUT030028 | JUNCTION | 0.00                     | 109.68                 | 0 00:00                                  | 0.000                                   | 3.406                                 |
| FSUT030026 | OUTFALL  | 0.00                     | 109.68                 | 0 00:00                                  | 0.000                                   | 3.408                                 |

\*\*\*\*\*  
Node Surcharge Summary  
\*\*\*\*\*

No nodes were surcharged.

\*\*\*\*\*  
Node Flooding Summary  
\*\*\*\*\*

No nodes were flooded.

\*\*\*\*\*

# Alternative 1: Corey Road System (10-Year)

Outfall Loading Summary  
\*\*\*\*\*

| Outfall Node | Flow Freq. Pcnt. | Avg. Flow CFS | Max. Flow CFS | Total Volume 10^6 gal |
|--------------|------------------|---------------|---------------|-----------------------|
| FSUT030026   | 99.97            | 6.93          | 109.68        | 3.408                 |
| System       | 99.97            | 6.93          | 109.68        | 3.408                 |

\*\*\*\*\*  
Link Flow Summary  
\*\*\*\*\*

| Link                | Type    | Maximum  Flow  CFS | Time of Max Occurrence days hr:min | Maximum  Veloc  ft/sec | Max/Full Flow | Max/Full Depth |
|---------------------|---------|--------------------|------------------------------------|------------------------|---------------|----------------|
| 36_EX15RCP          | CONDUIT | 0.74               | 0 13:00                            | 2.11                   | 0.11          | 0.33           |
| 37_EX15RCP          | CONDUIT | 1.21               | 0 13:00                            | 2.05                   | 0.33          | 0.64           |
| 38_EX18RCP          | CONDUIT | 2.35               | 0 12:55                            | 3.67                   | 0.35          | 0.81           |
| 39_EX18RCP          | CONDUIT | 2.27               | 0 12:50                            | 2.24                   | 0.24          | 0.94           |
| 40_EX15RCP          | CONDUIT | 1.00               | 0 13:00                            | 1.29                   | 0.11          | 1.00           |
| 41_EX24RCP          | CONDUIT | 5.82               | 0 13:03                            | 1.85                   | 0.56          | 1.00           |
| 42_EX15RCP          | CONDUIT | 2.47               | 0 13:00                            | 2.35                   | 0.66          | 1.00           |
| 43_EX18RCP          | CONDUIT | 2.39               | 0 13:00                            | 1.35                   | 0.22          | 1.00           |
| 44_EX24RCP          | CONDUIT | 10.66              | 0 13:02                            | 3.39                   | 0.21          | 1.00           |
| 44_PROP24RCP        | CONDUIT | 7.94               | 0 13:00                            | 5.34                   | 0.49          | 0.48           |
| 45_EXCHANNEL        | CONDUIT | 7.70               | 0 13:01                            | 1.34                   | 0.05          | 0.42           |
| 46_PROP30RCP        | CONDUIT | 24.31              | 0 12:56                            | 5.14                   | 0.47          | 0.96           |
| 47_CHANNEL2         | CONDUIT | 20.99              | 0 13:30                            | 2.10                   | 0.37          | 1.00           |
| 48_EX24RCP          | CONDUIT | 13.13              | 0 13:01                            | 4.18                   | 1.10          | 1.00           |
| 49_EX42RCP          | CONDUIT | 27.57              | 0 13:21                            | 2.87                   | 0.85          | 1.00           |
| 50_EX48RCP          | CONDUIT | 36.53              | 0 13:09                            | 3.68                   | 0.37          | 1.00           |
| 51_EX48RCP          | CONDUIT | 36.53              | 0 13:09                            | 4.81                   | 0.61          | 0.93           |
| 52_EX15RCP          | CONDUIT | 3.11               | 0 00:05                            | 2.88                   | 0.60          | 1.00           |
| 53_EX48RCP          | CONDUIT | 36.85              | 0 13:09                            | 5.34                   | 0.73          | 0.80           |
| 54_EX48RCP          | CONDUIT | 36.88              | 0 13:10                            | 3.42                   | 0.19          | 0.83           |
| 56_EX15RCP          | CONDUIT | 2.78               | 0 00:03                            | 2.86                   | 0.59          | 1.00           |
| 57_EX48RCP          | CONDUIT | 40.32              | 0 13:09                            | 5.02                   | 0.54          | 0.93           |
| 58_EX36RCP          | CONDUIT | 52.54              | 0 00:01                            | 4.62                   | 0.77          | 1.00           |
| 59_EX15RCP          | CONDUIT | 3.34               | 0 00:02                            | 3.01                   | 0.47          | 1.00           |
| 60_EX36RCP          | CONDUIT | 80.40              | 0 00:01                            | 6.70                   | 8.35          | 1.00           |
| 61_EX36RCP          | CONDUIT | 89.76              | 0 00:01                            | 6.50                   | 2.97          | 1.00           |
| 62_PROP_TWIN_48_RCP | CONDUIT | 109.68             | 0 00:00                            | 5.35                   | 0.77          | 0.90           |
| 62_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 63_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 64_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 65_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 66_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 68_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 69_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 70_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 71_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.01           |
| 72_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 73_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 74_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 75_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 76_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 77_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 80_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.02           |
| 81_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.08           |
| 82_OVERLAND         | CONDUIT | 9.02               | 0 13:13                            | 0.67                   | 0.00          | 0.11           |
| 83_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 84_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 85_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 86_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 87_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 88_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 89_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |
| 90_OVERLAND         | CONDUIT | 0.00               | 0 00:00                            | 0.00                   | 0.00          | 0.00           |

# Alternative 1: Corey Road System (10-Year)

\*\*\*\*\*  
 Flow Classification Summary  
 \*\*\*\*\*

| Conduit             | Adjusted /Actual Length | --- Fraction of Dry | Up Dry | Down Dry | Time in Flow Sub Crit | Sup Crit | Class Up Crit | --- Down Crit | Avg. Froude Number | Avg. Flow Change |
|---------------------|-------------------------|---------------------|--------|----------|-----------------------|----------|---------------|---------------|--------------------|------------------|
| 36_EX15RCP          | 4.61                    | 0.23                | 0.00   | 0.00     | 0.77                  | 0.00     | 0.00          | 0.00          | 0.52               | 0.0000           |
| 37_EX15RCP          | 1.00                    | 0.23                | 0.00   | 0.00     | 0.77                  | 0.00     | 0.00          | 0.00          | 0.39               | 0.0001           |
| 38_EX18RCP          | 1.85                    | 0.23                | 0.00   | 0.00     | 0.76                  | 0.01     | 0.00          | 0.00          | 0.69               | 0.0001           |
| 39_EX18RCP          | 1.00                    | 0.23                | 0.00   | 0.00     | 0.77                  | 0.00     | 0.00          | 0.00          | 0.36               | 0.0000           |
| 40_EX15RCP          | 5.46                    | 0.23                | 0.00   | 0.00     | 0.76                  | 0.01     | 0.00          | 0.00          | 0.23               | 0.0000           |
| 41_EX24RCP          | 1.00                    | 0.01                | 0.22   | 0.00     | 0.77                  | 0.00     | 0.00          | 0.00          | 0.22               | 0.0001           |
| 42_EX15RCP          | 1.00                    | 0.10                | 0.13   | 0.00     | 0.74                  | 0.04     | 0.00          | 0.00          | 0.61               | 0.0001           |
| 43_EX18RCP          | 3.29                    | 0.01                | 0.09   | 0.00     | 0.90                  | 0.00     | 0.00          | 0.00          | 0.15               | 0.0001           |
| 44_EX24RCP          | 9.54                    | 0.01                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00          | 0.07               | 0.0001           |
| 44_PROP24RCP        | 1.59                    | 0.23                | 0.00   | 0.00     | 0.01                  | 0.76     | 0.00          | 0.00          | 1.01               | 0.0001           |
| 45_EXCHANNEL        | 1.00                    | 0.04                | 0.20   | 0.00     | 0.76                  | 0.00     | 0.00          | 0.00          | 0.18               | 0.0000           |
| 46_PROP30RCP        | 2.00                    | 0.01                | 0.03   | 0.00     | 0.96                  | 0.00     | 0.00          | 0.00          | 0.38               | 0.0001           |
| 47_CHANNEL2         | 3.89                    | 0.01                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00          | 0.06               | 0.0002           |
| 48_EX24RCP          | 1.00                    | 0.00                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00          | 0.02               | 0.0005           |
| 49_EX42RCP          | 1.00                    | 0.00                | 0.00   | 0.00     | 0.99                  | 0.00     | 0.00          | 0.00          | 0.06               | 0.0004           |
| 50_EX48RCP          | 7.67                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.07               | 0.0002           |
| 51_EX48RCP          | 1.00                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.08               | 0.0003           |
| 52_EX15RCP          | 2.69                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0005           |
| 53_EX48RCP          | 1.00                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.12               | 0.0003           |
| 54_EX48RCP          | 5.18                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.09               | 0.0001           |
| 56_EX15RCP          | 3.69                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0006           |
| 57_EX48RCP          | 1.76                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.06               | 0.0004           |
| 58_EX36RCP          | 1.00                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.01               | 0.0018           |
| 59_EX15RCP          | 1.00                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0008           |
| 60_EX36RCP          | 2.74                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0317           |
| 61_EX36RCP          | 4.39                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0076           |
| 62_PROP_TWLN_48_RCP | 1.14                    | 0.00                | 0.00   | 0.00     | 1.00                  | 0.00     | 0.00          | 0.00          | 0.02               | 0.0009           |
| 62_OVERLAND         | 9.40                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 63_OVERLAND         | 1.16                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 64_OVERLAND         | 3.04                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 65_OVERLAND         | 1.19                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 66_OVERLAND         | 3.49                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 68_OVERLAND         | 1.00                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 69_OVERLAND         | 1.17                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 70_OVERLAND         | 1.19                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 71_OVERLAND         | 1.04                    | 0.97                | 0.03   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 72_OVERLAND         | 1.00                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 73_OVERLAND         | 1.13                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 74_OVERLAND         | 5.37                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 75_OVERLAND         | 1.89                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 76_OVERLAND         | 1.25                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 77_OVERLAND         | 1.85                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 80_OVERLAND         | 1.00                    | 0.96                | 0.04   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 81_OVERLAND         | 4.39                    | 0.94                | 0.06   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 82_OVERLAND         | 10.95                   | 0.93                | 0.03   | 0.00     | 0.00                  | 0.00     | 0.04          | 0.00          | 0.00               | 0.0000           |
| 83_OVERLAND         | 9.08                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 84_OVERLAND         | 3.18                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 85_OVERLAND         | 8.03                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 86_OVERLAND         | 3.71                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 87_OVERLAND         | 6.96                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 88_OVERLAND         | 12.94                   | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 89_OVERLAND         | 8.65                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |
| 90_OVERLAND         | 8.55                    | 1.00                | 0.00   | 0.00     | 0.00                  | 0.00     | 0.00          | 0.00          | 0.00               | 0.0000           |

\*\*\*\*\*  
 Conduit Surcharge Summary  
 \*\*\*\*\*

| Conduit | ----- Hours Both Ends | Hours Full Upstream | ----- Hours Dnstream | Hours Above Normal Flow | Hours Capacity Limited |
|---------|-----------------------|---------------------|----------------------|-------------------------|------------------------|
|         |                       |                     |                      |                         |                        |



## Alternative 1: Corey Road System (10-Year)

|                     |       |       |       |      |       |
|---------------------|-------|-------|-------|------|-------|
| 40_EX15RCP          | 0.68  | 0.68  | 0.68  | 0.01 | 0.01  |
| 41_EX24RCP          | 0.51  | 0.51  | 0.51  | 0.01 | 0.01  |
| 42_EX15RCP          | 0.86  | 0.86  | 0.86  | 0.01 | 0.01  |
| 43_EX18RCP          | 0.97  | 0.97  | 0.97  | 0.01 | 0.01  |
| 44_EX24RCP          | 0.90  | 0.90  | 0.90  | 0.01 | 0.01  |
| 47_CHANNEL2         | 1.31  | 1.31  | 1.31  | 0.01 | 0.01  |
| 48_EX24RCP          | 2.56  | 2.56  | 2.56  | 0.20 | 0.41  |
| 49_EX42RCP          | 0.80  | 0.80  | 0.80  | 0.01 | 0.64  |
| 50_EX48RCP          | 0.10  | 0.10  | 0.11  | 0.01 | 0.10  |
| 52_EX15RCP          | 23.86 | 23.86 | 23.87 | 0.01 | 0.01  |
| 56_EX15RCP          | 23.91 | 23.91 | 23.91 | 0.01 | 0.01  |
| 58_EX36RCP          | 2.59  | 2.59  | 2.60  | 0.68 | 0.01  |
| 59_EX15RCP          | 23.94 | 23.94 | 23.94 | 0.01 | 0.01  |
| 60_EX36RCP          | 23.96 | 23.96 | 23.97 | 6.24 | 12.18 |
| 61_EX36RCP          | 23.97 | 23.97 | 23.98 | 2.22 | 3.06  |
| 62_PROP_TWIN_48_RCP | 0.01  | 0.01  | 0.01  | 0.01 | 0.01  |

Analysis begun on: Thu Jan 14 14:56:59 2016  
Analysis ended on: Thu Jan 14 14:57:00 2016  
Total elapsed time: 00:00:01

**SECONDARY SYSTEM  
ALTERNATIVE:  
HYDRAFLOW STORM  
SEWERS**

# Storm Sewer Inventory Report

| Line No. | Alignment      |                  |                  |           | Flow Data     |                |                  |                  | Physical Data     |                |                   |                |            |             |                  |                    | Line ID    |
|----------|----------------|------------------|------------------|-----------|---------------|----------------|------------------|------------------|-------------------|----------------|-------------------|----------------|------------|-------------|------------------|--------------------|------------|
|          | Dnstr Line No. | Line Length (ft) | Defl angle (deg) | Junc Type | Known Q (cfs) | Drng Area (ac) | Runoff Coeff (C) | Inlet Time (min) | Invert El Dn (ft) | Line Slope (%) | Invert El Up (ft) | Line Size (in) | Line Shape | N Value (n) | J-Loss Coeff (K) | Inlet/ Rim El (ft) |            |
| 1        | End            | 21.58            | 0.00             | Comb      | 0.00          | 0.23           | 0.40             | 5.0              | 52.99             | 1.07           | 53.22             | 24             | Cir        | 0.013       | 1.27             | 57.07              | 30_EX24RCP |
| 2        | 1              | 134.46           | 34.77            | Comb      | 0.00          | 0.04           | 0.90             | 5.0              | 53.22             | 0.55           | 53.96             | 24             | Cir        | 0.013       | 1.50             | 58.71              | 34_EX24RCP |
| 3        | 2              | 32.20            | 46.64            | Comb      | 0.00          | 0.24           | 0.50             | 5.0              | 53.96             | -0.06          | 53.94             | 24             | Cir        | 0.013       | 1.73             | 58.69              | 35_EX24RCP |
| 4        | 3              | 307.46           | -135.97          | Comb      | 0.00          | 0.83           | 0.50             | 5.0              | 53.94             | 0.17           | 54.45             | 18             | Cir        | 0.013       | 1.50             | 57.85              | 28_EX18RCP |
| 5        | 4              | 24.58            | 95.59            | Comb      | 0.00          | 0.50           | 0.50             | 5.0              | 54.45             | 1.67           | 54.86             | 15             | Cir        | 0.013       | 1.00             | 57.96              | 27_EX15RCP |
| 6        | 3              | 25.21            | -46.56           | Comb      | 0.00          | 0.83           | 0.50             | 5.0              | 53.94             | 1.55           | 54.33             | 18             | Cir        | 0.013       | 1.00             | 58.83              | 31_EX18RCP |
| 7        | 2              | 25.30            | -89.72           | Comb      | 0.00          | 0.37           | 0.40             | 5.0              | 54.11             | 0.55           | 54.25             | 15             | Cir        | 0.013       | 1.00             | 58.85              | 32_EX15RCP |
| 8        | 1              | 26.15            | -55.01           | Comb      | 0.00          | 0.23           | 0.50             | 5.0              | 53.22             | 2.45           | 53.86             | 15             | Cir        | 0.013       | 1.00             | 57.06              | 33_EX15RCP |

# Storm Sewer Summary Report

| Line No. | Line ID    | Flow rate (cfs) | Line Size (in) | Line shape | Line length (ft) | Invert EL Dn (ft) | Invert EL Up (ft) | Line Slope (%) | HGL Down (ft) | HGL Up (ft) | Minor loss (ft) | HGL Junct (ft) | Dns Line No. | Junction Type |
|----------|------------|-----------------|----------------|------------|------------------|-------------------|-------------------|----------------|---------------|-------------|-----------------|----------------|--------------|---------------|
| 1        | 30_EX24RCP | 11.18           | 24             | Cir        | 21.58            | 52.99             | 53.22             | 1.066          | 54.19         | 54.20       | n/a             | 54.20 j        | End          | Combination   |
| 2        | 34_EX24RCP | 9.73            | 24             | Cir        | 134.46           | 53.22             | 53.96             | 0.550          | 54.31         | 55.05       | n/a             | 55.05          | 1            | Combination   |
| 3        | 35_EX24RCP | 8.44            | 24             | Cir        | 32.20            | 53.96             | 53.94             | -0.062         | 55.96*        | 56.00*      | 0.19            | 56.20          | 2            | Combination   |
| 4        | 28_EX18RCP | 4.67            | 18             | Cir        | 307.46           | 53.94             | 54.45             | 0.166          | 56.20*        | 56.81*      | 0.16            | 56.97          | 3            | Combination   |
| 5        | 27_EX15RCP | 1.76            | 15             | Cir        | 24.58            | 54.45             | 54.86             | 1.668          | 56.97*        | 56.99*      | 0.03            | 57.02          | 4            | Combination   |
| 6        | 31_EX18RCP | 2.92            | 18             | Cir        | 25.21            | 53.94             | 54.33             | 1.547          | 56.20*        | 56.22*      | 0.04            | 56.26          | 3            | Combination   |
| 7        | 32_EX15RCP | 1.04            | 15             | Cir        | 25.30            | 54.11             | 54.25             | 0.553          | 55.05         | 54.65       | n/a             | 54.65          | 2            | Combination   |
| 8        | 33_EX15RCP | 0.81            | 15             | Cir        | 26.15            | 53.22             | 53.86             | 2.447          | 54.20         | 54.10       | n/a             | 54.10 j        | 1            | Combination   |

Project File: 2015\_09\_30\_Trafalgar\_REV.stm

Number of lines: 8

Run Date: 1/14/2016

NOTES: Return period = 10 Yrs. ; \*Surcharged (HGL above crown). ; j - Line contains hyd. jump.

# Inlet Report

| Line No | Inlet ID   | Q = CIA<br>(cfs) | Q carry<br>(cfs) | Q capt<br>(cfs) | Q Byp<br>(cfs) | Junc Type | Curb Inlet |        | Grate Inlet |        |        | Gutter     |        |            |            |       |            | Inlet       |            |             | Byp Line No |           |
|---------|------------|------------------|------------------|-----------------|----------------|-----------|------------|--------|-------------|--------|--------|------------|--------|------------|------------|-------|------------|-------------|------------|-------------|-------------|-----------|
|         |            |                  |                  |                 |                |           | Ht (in)    | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n     | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) |             | Depr (in) |
| 1       | FSUT010046 | 0.65             | 0.04             | 0.63            | 0.05           | Comb      | 6.0        | 3.00   | 0.00        | 3.00   | 2.00   | 0.010      | 2.00   | 0.050      | 0.031      | 0.013 | 0.16       | 3.97        | 0.23       | 1.24        | 2.0         | Off       |
| 2       | FSUT010048 | 0.25             | 0.36             | 0.58            | 0.04           | Comb      | 6.0        | 3.00   | 0.00        | 3.00   | 2.00   | 0.010      | 2.00   | 0.050      | 0.031      | 0.013 | 0.16       | 3.78        | 0.22       | 1.12        | 2.0         | 1         |
| 3       | FSUT010050 | 0.84             | 0.88             | 1.36            | 0.36           | Comb      | 6.0        | 3.00   | 0.00        | 3.00   | 2.00   | 0.010      | 2.00   | 0.050      | 0.031      | 0.013 | 0.22       | 5.91        | 0.30       | 2.94        | 2.0         | 2         |
| 4       | FSUT010051 | 2.92             | 0.00             | 2.04            | 0.88           | Comb      | 6.0        | 3.00   | 0.00        | 3.00   | 2.00   | 0.010      | 2.00   | 0.050      | 0.031      | 0.013 | 0.27       | 7.33        | 0.34       | 4.45        | 2.0         | 3         |
| 5       | FSUT010052 | 1.76             | 0.00             | 1.76            | 0.00           | Comb      | 6.0        | 3.00   | 2.80        | 3.00   | 2.00   | Sag        | 2.00   | 0.050      | 0.031      | 0.013 | 0.24       | 6.58        | 0.41       | 6.58        | 2.0         | Off       |
| 6       | FSUT010053 | 2.92             | 0.00             | 2.92            | 0.00           | Comb      | 6.0        | 3.00   | 2.80        | 3.00   | 2.00   | Sag        | 2.00   | 0.050      | 0.031      | 0.013 | 0.32       | 9.06        | 0.49       | 9.06        | 2.0         | Off       |
| 7       | FSUT010049 | 1.04             | 0.00             | 1.04            | 0.00           | Comb      | 6.0        | 3.00   | 2.80        | 3.00   | 2.00   | Sag        | 2.00   | 0.050      | 0.031      | 0.000 | 0.19       | 4.74        | 0.35       | 4.74        | 2.0         | Off       |
| 8       | FSUT010047 | 0.81             | 0.00             | 0.81            | 0.00           | Comb      | 6.0        | 3.00   | 2.80        | 3.00   | 2.00   | Sag        | 2.00   | 0.050      | 0.031      | 0.013 | 0.17       | 4.10        | 0.33       | 4.10        | 2.0         | Off       |

Project File: 2015\_09\_30\_Trafalgar\_REV.stm

Number of lines: 8

Run Date: 1/14/2016

NOTES: Inlet N-Values = 0.016; Intensity = 84.35 / (Inlet time + 15.10) ^ 0.83; Return period = 10 Yrs. ; \* Indicates Known Q added. All curb inlets are Horiz throat.

# Hydraulic Grade Line Computations

| Line<br>(1) | Size<br>(in)<br>(2) | Q<br>(cfs)<br>(3) | Downstream                    |                            |                      |                       |                      |                            |                             |                   | Len<br>(ft)<br>(12) | Upstream                       |                             |                       |                        |                       |                             |                             |                   | Check                    |                               | JL<br>coeff<br>(K)<br>(23) | Minor<br>loss<br>(ft)<br>(24) |
|-------------|---------------------|-------------------|-------------------------------|----------------------------|----------------------|-----------------------|----------------------|----------------------------|-----------------------------|-------------------|---------------------|--------------------------------|-----------------------------|-----------------------|------------------------|-----------------------|-----------------------------|-----------------------------|-------------------|--------------------------|-------------------------------|----------------------------|-------------------------------|
|             |                     |                   | Invert<br>elev<br>(ft)<br>(4) | HGL<br>elev<br>(ft)<br>(5) | Depth<br>(ft)<br>(6) | Area<br>(sqft)<br>(7) | Vel<br>(ft/s)<br>(8) | Vel<br>head<br>(ft)<br>(9) | EGL<br>elev<br>(ft)<br>(10) | Sf<br>(%)<br>(11) |                     | Invert<br>elev<br>(ft)<br>(13) | HGL<br>elev<br>(ft)<br>(14) | Depth<br>(ft)<br>(15) | Area<br>(sqft)<br>(16) | Vel<br>(ft/s)<br>(17) | Vel<br>head<br>(ft)<br>(18) | EGL<br>elev<br>(ft)<br>(19) | Sf<br>(%)<br>(20) | Ave<br>Sf<br>(%)<br>(21) | Enrgy<br>loss<br>(ft)<br>(22) |                            |                               |
| 1           | 24                  | 11.18             | 52.99                         | 54.19                      | 1.20                 | 1.97                  | 5.68                 | 0.84                       | 55.03                       | 0.000             | 21.58               | 53.22                          | 54.20 j                     | 0.98                  | 1.52                   | 7.35                  | 0.84                        | 55.04                       | 0.000             | 0.000                    | 0.000                         | 1.27                       | n/a                           |
| 2           | 24                  | 9.73              | 53.22                         | 54.31                      | 1.09*                | 1.76                  | 5.54                 | 0.48                       | 54.79                       | 0.000             | 134.46              | 53.96                          | 55.05                       | 1.09                  | 1.76                   | 5.54                  | 0.48                        | 55.53                       | 0.000             | 0.000                    | 0.000                         | 1.50                       | n/a                           |
| 3           | 24                  | 8.44              | 53.96                         | 55.96                      | 2.00*                | 3.14                  | 2.69                 | 0.11                       | 56.07                       | 0.139             | 32.20               | 53.94                          | 56.00                       | 2.00                  | 3.14                   | 2.69                  | 0.11                        | 56.12                       | 0.139             | 0.139                    | 0.045                         | 1.73                       | 0.19                          |
| 4           | 18                  | 4.67              | 53.94                         | 56.20                      | 1.50                 | 1.77                  | 2.65                 | 0.11                       | 56.31                       | 0.198             | 307.46              | 54.45                          | 56.81                       | 1.50                  | 1.77                   | 2.65                  | 0.11                        | 56.92                       | 0.198             | 0.198                    | 0.609                         | 1.50                       | 0.16                          |
| 5           | 15                  | 1.76              | 54.45                         | 56.97                      | 1.25                 | 1.23                  | 1.43                 | 0.03                       | 57.00                       | 0.074             | 24.58               | 54.86                          | 56.99                       | 1.25                  | 1.23                   | 1.43                  | 0.03                        | 57.02                       | 0.074             | 0.074                    | 0.018                         | 1.00                       | 0.03                          |
| 6           | 18                  | 2.92              | 53.94                         | 56.20                      | 1.50                 | 1.77                  | 1.65                 | 0.04                       | 56.24                       | 0.077             | 25.21               | 54.33                          | 56.22                       | 1.50                  | 1.77                   | 1.65                  | 0.04                        | 56.26                       | 0.077             | 0.077                    | 0.019                         | 1.00                       | 0.04                          |
| 7           | 15                  | 1.04              | 54.11                         | 55.05                      | 0.94                 | 0.34                  | 1.05                 | 0.15                       | 55.21                       | 0.000             | 25.30               | 54.25                          | 54.65                       | 0.40**                | 0.33                   | 3.12                  | 0.15                        | 54.80                       | 0.000             | 0.000                    | 0.000                         | 1.00                       | n/a                           |
| 8           | 15                  | 0.81              | 53.22                         | 54.20                      | 0.98                 | 0.28                  | 0.79                 | 0.38                       | 54.57                       | 0.000             | 26.15               | 53.86                          | 54.10 j                     | 0.24                  | 0.16                   | 4.93                  | 0.38                        | 54.48                       | 0.000             | 0.000                    | 0.000                         | 1.00                       | n/a                           |

Project File: 2015\_09\_30\_Trafalgar\_REV.stm

Number of lines: 8

Run Date: 1/14/2016

Notes: \* Normal depth assumed.; \*\* Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

## General Procedure:

Hydraflow computes the HGL using the Bernoulli energy equation. Manning's equation is used to determine energy losses due to pipe friction. In a standard step, iterative procedure, Hydraflow assumes upstream HGLs until the energy equation balances. If the energy equation cannot balance, supercritical flow exists and critical depth is temporarily assumed at the upstream end. A supercritical flow Profile is then computed using the same procedure in a downstream direction using momentum principles.

Col. 1 The line number being computed. Calculations begin at Line 1 and proceed upstream.

Col. 2 The line size. In the case of non-circular pipes, the line rise is printed above the span.

Col. 3 Total flow rate in the line.

Col. 4 The elevation of the downstream invert.

Col. 5 Elevation of the hydraulic grade line at the downstream end. This is computed as the upstream HGL + Minor loss of this line's downstream line.

Col. 6 The downstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 7 Cross-sectional area of the flow at the downstream end.

Col. 8 The velocity of the flow at the downstream end, (Col. 3 / Col. 7).

Col. 9 Velocity head (Velocity squared / 2g).

Col. 10 The elevation of the energy grade line at the downstream end, HGL + Velocity head, (Col. 5 + Col. 9).

Col. 11 The friction slope at the downstream end (the S or Slope term in Manning's equation).

Col. 12 The line length.

Col. 13 The elevation of the upstream invert.

Col. 14 Elevation of the hydraulic grade line at the upstream end.

Col. 15 The upstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 16 Cross-sectional area of the flow at the upstream end.

Col. 17 The velocity of the flow at the upstream end, (Col. 3 / Col. 16).

Col. 18 Velocity head (Velocity squared / 2g).

Col. 19 The elevation of the energy grade line at the upstream end, HGL + Velocity head, (Col. 14 + Col. 18) .

Col. 20 The friction slope at the upstream end (the S or Slope term in Manning's equation).

Col. 21 The average of the downstream and upstream friction slopes.

Col. 22 Energy loss. Average  $Sf/100 \times \text{Line Length}$  (Col. 21/100 x Col. 12). Equals (EGL upstream - EGL downstream) +/- tolerance.

Col. 23 The junction loss coefficient (K).

Col. 24 Minor loss. (Col. 23 x Col. 18). Is added to upstream HGL and used as the starting HGL for the next upstream line(s).

---

## **Appendix I:**

# **BMP Conceptual Design and Nutrient Calculations**

### List of Contents:

1. BMP Conceptual Design Calculations
  2. Nutrient Calculations
  3. RSC Calculations
-



# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Bioretention Pond - Cromwell Dr

Project: City of Greenville - Fork Swamp Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|  |                 |                   |            |
|--|-----------------|-------------------|------------|
| Water Quality Event (in)                     | 1.00            |                   | Input      |
|  | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)                        | 40,665          | 40,665            | Input      |
| Sub-basin CN                                 | 74              | 93                | Input      |
| S (in)                                       | 3.51            | 0.75              | Calculated |
| R/O (in)                                     | 0.02            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)                  | 943             | 18315             | Calculated |
| Sub-basin WQ Volume (cf)                     | 79              | 1526              | Calculated |
| Runoff Coefficient, C                        | 0.23            | 0.80              | Input      |
|  |                 |                   |            |
| <b>Summary Calculations</b>                  |                 |                   |            |
| Total Watershed area (sq ft)                 | 81,330          |                   | Calculated |
| Total Watershed area (acres)                 | 1.87            |                   | Calculated |
| Total WQ Runoff Volume (sf*in)               | 19,258          |                   | Calculated |
| Total WQ Runoff Volume (cf)                  | 1,605           |                   | Calculated |
| Peak Flow Rate, cfs                          | 7.73            |                   | Calculated |
| Pipe Diameter, ft                            | 14.85           | <b>18"</b>        | Calculated |
|  |                 |                   |            |
| <b>Surface area of bioretention</b>          |                 |                   |            |
| Average depth of water (in)                  | 10              |                   | Input      |
| Surface area of bioretention (sf)            | 1,926           |                   | Calculated |
| Surface area of bioretention (ac)            | 0.044           |                   | Calculated |
| Surface area of bioretention, available (sf) | 2,000           |                   | Input      |
| Surface area of bioretention, available (ac) | 0.05            |                   | Input      |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Bioretention Pond - H. Boyd Lee Park

Project: City of Greenville - Fork Swamp Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|  |                 |                   |            |
|--|-----------------|-------------------|------------|
| Water Quality Event (in)                     | 1.00            |                   | Input      |
|  | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)                        | 257,464         | 110,213           | Input      |
| Sub-basin CN                                 | 80              | 93                | Input      |
| S (in)                                       | 2.50            | 0.75              | Calculated |
| R/O (in)                                     | 0.08            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)                  | 21455           | 49638             | Calculated |
| Sub-basin WQ Volume (cf)                     | 1788            | 4137              | Calculated |
| Runoff Coefficient, C                        | 0.23            | 0.80              | Input      |
|  |                 |                   |            |
| <b>Summary Calculations</b>                  |                 |                   |            |
| Total Watershed area (sq ft)                 | 367,677         |                   | Calculated |
| Total Watershed area (acres)                 | 8.44            |                   | Calculated |
| Total WQ Runoff Volume (sf*in)               | 71,094          |                   | Calculated |
| Total WQ Runoff Volume (cf)                  | 5,924           |                   | Calculated |
| Peak Flow, cfs                               | 27.20           |                   | Calculated |
| Pipe Diameter, ft                            | 23.81           | 24"               | Calculated |
|  |                 |                   |            |
| <b>Surface area of bioretention</b>          |                 |                   |            |
| Average depth of water (in)                  | 10              |                   | Input      |
| Surface area of bioretention, required (sf)  | 7,109           |                   | Calculated |
| Surface area of bioretention, required (ac)  | 0.163           |                   | Calculated |
| Surface area of bioretention, available (sf) | 42,000          |                   | Input      |
| Surface area of bioretention, available (ac) | 0.96            |                   | Input      |
| Depth of Bioretention (in)                   | 36              |                   | Input      |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Permeable Pavement - H. Boyd Lee Park

Project: City of Greenville - Fork Swamp Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

| SITE DETAILS                   |         |          |
|--------------------------------|---------|----------|
| Initial Soil Infiltration Rate | 10      | (in/hr)  |
| Compaction?                    | Extreme |          |
| Site Slope, s                  | 0.013   | (ft/ft)  |
| Permeable Surface Area         | 16,988  | (sq. ft) |
| Lot Length (along slope)       | 850     | (ft)     |
| Lot width (on grade)           | 20.0    | (ft)     |
| Additional Contributing Area   | 134455  | (sq. ft) |
| Total Treatment Area           | 151,443 | (sq. ft) |
| Final Soil Infiltration Rate   | 0.5     | (in/hr)  |

| PAVEMENT SPECS                           |            |              |
|--|------------|--------------|
| Type                                     | PICP       |              |
| Paver Depth (Thickness)                  | 3.5        | (in)         |
| Surface Open Joint Space                 | 20         | (%)          |
| Initial Abstraction at Pavement Surface  | 0.01       | (in)         |
| SUBSURFACE LAYERS                        | Depth (in) | Porosity (%) |
| Fill Media                               | pea gravel | 20           |
| Bedding Layer                            | 2          | 40           |
| Base (aggregate)                         | 4          | 35           |
| Gravel casing layer (beneath underdrain) | 6          | (in)         |
| Total Pavement Depth                     | 15.5       | (in)         |
| Max H <sub>2</sub> O Storage             | 4.44       | (in)         |

|                     |    |
|---------------------|----|
| Underdrains Needed? | No |
|---------------------|----|

| Underdrain Sizing (if necessary - Check Above) |         |          |
|--|---------|----------|
| # of Underdrain Pipes                          | 1       |          |
| Pipe Slope (oriented along site slope)         | 0.013   | (ft/ft)  |
| Length of underdrain                           | 850     | (ft)     |
| Surface Infiltration Rate                      | 4       | (in/hr)  |
| Peak Flow (calc)                               | 334.49  | (cfs)    |
| Factor of Safety                               | 2       |          |
| Peak Flow (design)                             | 1337.96 | (cfs)    |
| Manning's n                                    | 0.015   |          |
| D  | 111.23  | (in)     |
| Drain Spacing                                  | 20.00   | (ft)     |
| Drainage Area                                  | 17000   | (sq. ft) |
| Pipe Diameter                                  | 0       | (in)     |

Underdrains are sized based on the surface infiltration rate

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Pond Retrofit - Faith Assembly Church

Project: City of Greenville - Fork Swamp Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|  |                 |                   |            |
|--|-----------------|-------------------|------------|
| Water Quality Event (in)                 | 1.00            |                   | Input      |
|  | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)                    | 174,063         | 43,516            | Input      |
| Sub-basin CN                             | 80              | 93                | Input      |
| S (in)                                   | 2.50            | 0.75              | Calculated |
| R/O (in)                                 | 0.08            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)              | 14505           | 19599             | Calculated |
| Sub-basin WQ Volume (cf)                 | 1209            | 1633              | Calculated |
| Runoff Coefficient                       | 0.23            | 0.80              | Calculated |
|  |                 |                   |            |
| <b>Summary Calculations</b>              |                 |                   |            |
| Total Watershed area (sq ft)             | 217,579         |                   | Calculated |
| Total Watershed area (acres)             | 4.99            |                   | Calculated |
| Total WQ Runoff Volume (sf*in)           | 34,104          |                   | Calculated |
| Total WQ Runoff Volume (cf)              | 2,842           |                   | Calculated |
| Peak Flow, cfs                           | 13.81           |                   |            |
| Pipe Diameter, ft                        | 18.46           | <b>24"</b>        | Calculated |
|  |                 |                   |            |
| <b>Surface area of wetland</b>           |                 |                   |            |
| Average depth of water (in)              | 8               |                   | Input      |
| Surface area of wet pond, required (sf)  | 4,263           |                   | Calculated |
| Surface area of wet pond, required (ac)  | 0.10            |                   | Calculated |
| Surface area of wet pond, available (sf) | 1,926           |                   | Input      |
| Surface area of wet pond, available (ac) | 0.04            |                   | Input      |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Regenerative Stormwater Conveyance - County Home Rd

Project: City of Greenville - Fork Swamp Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|                                |                 |                   |            |
|--------------------------------|-----------------|-------------------|------------|
| Water Quality Event (in)       | 1.00            |                   | Input      |
|                                | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)          | 828,949         | 207,237           | Input      |
| Sub-basin CN                   | 80              | 93                | Input      |
| S (in)                         | 2.50            | 0.75              | Calculated |
| R/O (in)                       | 0.08            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)    | 69079           | 93337             | Calculated |
| Sub-basin WQ Volume (cf)       | 5757            | 7778              | Calculated |
| Runoff Coefficient, C          | 0.23            | 0.80              | Calculated |
|                                |                 |                   |            |
| <b>Summary Calculations</b>    |                 |                   |            |
| Total Watershed area (sq ft)   | 1,036,186       |                   | Calculated |
| Total Watershed area (acres)   | 23.79           |                   | Calculated |
| Total WQ Runoff Volume (sf*in) | 162,416         |                   | Calculated |
| Total WQ Runoff Volume (cf)    | 13,535          |                   | Calculated |
| Peak Flow, cfs                 | 65.8            |                   | Calculated |
|                                |                 |                   |            |
| <b>Surface area of RSC</b>     |                 |                   |            |
| Length of Channel (ft)         | 430             |                   | Input      |
| Riffle Top Width (ft)          | 50.0            |                   | Calculated |
| Riffle Depth (ft)              | 1.0             |                   | Calculated |
| Pool Depth (ft)                | 2.0             |                   | Calculated |
| Number of Pools                | 17.9            |                   | Calculated |
| Surface Area of RSC (sf)       | 21,500          |                   | Calculated |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Regenerative Stormwater Conveyance - Irish Creek

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|                                |                 |                   |            |
|--------------------------------|-----------------|-------------------|------------|
| Water Quality Event (in)       | 1.00            |                   | Input      |
|                                | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)          | 268,612         | 115,119           | Input      |
| Sub-basin CN                   | 80              | 93                | Input      |
| S (in)                         | 2.50            | 0.75              | Calculated |
| R/O (in)                       | 0.08            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)    | 22384           | 51848             | Calculated |
| Sub-basin WQ Volume (cf)       | 1865            | 4321              | Calculated |
| Runoff Coefficient, C          | 0.23            | 0.80              | Input      |
|                                |                 |                   |            |
| <b>Summary Calculations</b>    |                 |                   |            |
| Total Watershed area (sq ft)   | 383,731         |                   | Calculated |
| Total Watershed area (acres)   | 8.81            |                   | Calculated |
| Total WQ Runoff Volume (sf*in) | 74,232          |                   | Calculated |
| Total WQ Runoff Volume (cf)    | 6,186           |                   | Calculated |
| Peak Flow, cfs                 | 28.40           |                   | Calculated |
|                                |                 |                   |            |
| <b>Surface area of RSC</b>     |                 |                   |            |
| Length of Channel, ft          | 300             |                   | Input      |
| Riffle Top Width, ft           | 40              |                   | Calculated |
| Riffle Depth, ft               | 1               |                   | Calculated |
| Pool Depth, ft                 | 1               |                   | Calculated |
| Number of Pools                | 13              |                   | Calculated |
| Surface Area of RSC (sf)       | 12,000          |                   | Calculated |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Regenerative Stormwater Conveyance - The Oaks

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|                                |                 |                   |            |
|--------------------------------|-----------------|-------------------|------------|
| Water Quality Event (in)       | 1.00            |                   | Input      |
|                                | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)          | 97,576          | 97,576            | Input      |
| Sub-basin CN                   | 80              | 93                | Input      |
| S (in)                         | 2.50            | 0.75              | Calculated |
| R/O (in)                       | 0.08            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)    | 8131            | 43947             | Calculated |
| Sub-basin WQ Volume (cf)       | 678             | 3662              | Calculated |
| Runoff Coefficient, C          | 0.23            | 0.80              | Input      |
|                                |                 |                   |            |
| <b>Summary Calculations</b>    |                 |                   |            |
| Total Watershed area (sq ft)   | 195,153         |                   | Calculated |
| Total Watershed area (acres)   | 4.48            |                   | Calculated |
| Total WQ Runoff Volume (sf*in) | 52,078          |                   | Calculated |
| Total WQ Runoff Volume (cf)    | 4,340           |                   | Calculated |
| Peak Flow, cfs                 | 18.55           |                   | Calculated |
|                                |                 |                   |            |
| <b>Surface area of RSC</b>     |                 |                   |            |
| Length of Channel, ft          | 380             |                   | Input      |
| Riffle Top Width, ft           | 20              |                   | Calculated |
| Riffle Depth, ft               | 1               |                   | Calculated |
| Pool Depth, ft                 | 1               |                   | Calculated |
| Number of Pools                | 16              |                   | Calculated |
| Surface Area of RSC (sf)       | 7,600           |                   | Calculated |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Bioretention Pond - South Hall

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|  |                 |                   |            |
|--|-----------------|-------------------|------------|
| Water Quality Event (in)                     | 1.00            |                   | Input      |
|  | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)                        | 15,944          | 63,777            | Input      |
| Sub-basin CN                                 | 74              | 93                | Input      |
| S (in)                                       | 3.51            | 0.75              | Calculated |
| R/O (in)                                     | 0.02            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)                  | 370             | 28724             | Calculated |
| Sub-basin WQ Volume (cf)                     | 31              | 2394              | Calculated |
| Runoff Coefficient, C                        | 0.23            | 0.80              | Input      |
|  |                 |                   |            |
| <b>Summary Calculations</b>                  |                 |                   |            |
| Total Watershed area (sq ft)                 | 79,721          |                   | Calculated |
| Total Watershed area (acres)                 | 1.83            |                   | Calculated |
| Total WQ Runoff Volume (sf*in)               | 29,094          |                   | Calculated |
| Total WQ Runoff Volume (cf)                  | 2,425           |                   | Calculated |
| Peak Flow, cfs                               | 10.09           |                   | Calculated |
| Pipe Diameter, ft                            | 16.41           | <b>18"</b>        | Calculated |
|  |                 |                   |            |
| <b>Surface area of bioretention</b>          |                 |                   |            |
| Average depth of water (in)                  | 10              |                   | Input      |
| Surface area of bioretention, required (sf)  | 2,909           |                   | Calculated |
| Surface area of bioretention, required (ac)  | 0.067           |                   | Calculated |
| Surface area of bioretention, available (sf) | 3,484           |                   | Input      |
| Surface area of bioretention, available (ac) | 0.08            |                   | Input      |



# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Water Quality Wetland - Paramore Park

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|   |                 |                   |            |
|---|-----------------|-------------------|------------|
| Water Quality Event (in)                | 1.00            |                   | Input      |
|   | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)                   | 161,870         | 69,373            | Input      |
| Sub-basin CN                            | 80              | 93                | Input      |
| S (in)                                  | 2.50            | 0.75              | Calculated |
| R/O (in)                                | 0.08            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)             | 13489           | 31245             | Calculated |
| Sub-basin WQ Volume (cf)                | 1124            | 2604              | Calculated |
| Runoff Coefficient, C                   | 0.23            | 0.80              | Input      |
|   |                 |                   |            |
| <b>Summary Calculations</b>             |                 |                   |            |
| Total Watershed area (sq ft)            | 231,243         |                   | Calculated |
| Total Watershed area (acres)            | 5.31            |                   | Calculated |
| Total WQ Runoff Volume (sf*in)          | 44,734          |                   | Calculated |
| Total WQ Runoff Volume (cf)             | 3,728           |                   | Calculated |
| Peak Flow, cfs                          | 17              |                   | Calculated |
| Pipe Diameter, ft                       | 20.01           | 24"               | Calculated |
|   |                 |                   |            |
| <b>Surface area of wetland</b>          |                 |                   |            |
| Average depth of water (in)             | 8               |                   | Input      |
| Surface area of wetland, required (sf)  | 5,592           |                   | Calculated |
| Surface area of wetland, required (ac)  | 0.128           |                   | Calculated |
| Surface area of wetland, available (sf) | 6,000           |                   | Input      |
| Surface area of wetland, available (ac) | 0.14            |                   | Input      |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Regenerative Stormwater Conveyance - WGP Properties

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|                                |                 |                   |            |
|--------------------------------|-----------------|-------------------|------------|
| Water Quality Event (in)       | 1.00            |                   | Input      |
|                                | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)          | 20,023          | 80,091            | Input      |
| Sub-basin CN                   | 80              | 93                | Input      |
| S (in)                         | 2.50            | 0.75              | Calculated |
| R/O (in)                       | 0.08            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)    | 1669            | 36072             | Calculated |
| Sub-basin WQ Volume (cf)       | 139             | 3006              | Calculated |
| Runoff Coefficient, C          | 0.23            | 0.80              | Input      |
|                                |                 |                   |            |
| <b>Summary Calculations</b>    |                 |                   |            |
| Total Watershed area (sq ft)   | 100,114         |                   | Calculated |
| Total Watershed area (acres)   | 2.30            |                   | Calculated |
| Total WQ Runoff Volume (sf*in) | 37,740          |                   | Calculated |
| Total WQ Runoff Volume (cf)    | 3,145           |                   | Calculated |
| Peak Flow, cfs                 | 12.68           |                   | Calculated |
|                                |                 |                   |            |
| <b>Surface area of RSC</b>     |                 |                   |            |
| Length of Channel, ft          | 60              |                   | Input      |
| Riffle Top Width, ft           | 20              |                   | Calculated |
| Riffle Depth, ft               | 1               |                   | Calculated |
| Pool Depth, ft                 | 2               |                   | Calculated |
| Number of Pools                | 3               |                   | Calculated |
| Surface Area of RSC (sf)       | 1,200           |                   | Calculated |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Bioretention Pond - Wintergreen Elementary

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|  |                 |                   |            |
|--|-----------------|-------------------|------------|
| Water Quality Event (in)                     | 1.00            |                   | Input      |
|  | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)                        | 245,110         | 105,047           | Input      |
| Sub-basin CN                                 | 74              | 93                | Input      |
| S (in)                                       | 3.51            | 0.75              | Calculated |
| R/O (in)                                     | 0.02            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)                  | 5685            | 47312             | Calculated |
| Sub-basin WQ Volume (cf)                     | 474             | 3943              | Calculated |
| Runoff Coefficient, C                        | 0.23            | 0.80              | Input      |
|  |                 |                   |            |
| <b>Summary Calculations</b>                  |                 |                   |            |
| Total Watershed area (sq ft)                 | 350,157         |                   | Calculated |
| Total Watershed area (acres)                 | 8.04            |                   | Calculated |
| Total WQ Runoff Volume (sf*in)               | 52,997          |                   | Calculated |
| Total WQ Runoff Volume (cf)                  | 4,416           |                   | Calculated |
| Peak Flow, cfs                               | 25.92           |                   |            |
| Pipe Diameter, ft                            | 23.38           | <b>24"</b>        | Calculated |
|  |                 |                   |            |
| <b>Surface area of bioretention</b>          |                 |                   |            |
| Average depth of water (in)                  | 10              |                   | Input      |
| Surface area of bioretention, required (sf)  | 5,300           |                   | Calculated |
| Surface area of bioretention, required (ac)  | 0.122           |                   | Calculated |
| Surface area of bioretention, available (sf) | 6,000           |                   | Input      |
| Surface area of bioretention, available (ac) | 0.14            |                   | Input      |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Regenerative Stormwater Conveyance - Wintergreen Elementary

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|                                |                 |                   |            |
|--------------------------------|-----------------|-------------------|------------|
| Water Quality Event (in)       | 1.00            |                   | Input      |
|                                | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)          | 608,528         | 405,685           | Input      |
| Sub-basin CN                   | 80              | 93                | Input      |
| S (in)                         | 2.50            | 0.75              | Calculated |
| R/O (in)                       | 0.08            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)    | 50711           | 182715            | Calculated |
| Sub-basin WQ Volume (cf)       | 4226            | 15226             | Calculated |
| Runoff Coefficient, C          | 0.23            | 0.80              | Input      |
|                                |                 |                   |            |
| <b>Summary Calculations</b>    |                 |                   |            |
| Total Watershed area (sq ft)   | 1,014,213       |                   | Calculated |
| Total Watershed area (acres)   | 23.28           |                   | Calculated |
| Total WQ Runoff Volume (sf*in) | 233,426         |                   | Calculated |
| Total WQ Runoff Volume (cf)    | 19,452          |                   | Calculated |
| Peak Flow, cfs                 | 85.74           |                   | Calculated |
|                                |                 |                   |            |
| <b>Surface area of RSC</b>     |                 |                   |            |
| Length of Channel, ft          | 120             |                   | Input      |
| Riffle Top Width, ft           | 35              |                   | Calculated |
| Riffle Depth, ft               | 1               |                   | Calculated |
| Pool Depth, ft                 | 2               |                   | Calculated |
| Number of Pools                | 8               |                   | Calculated |
| Surface Area of RSC (sf)       | 4,200           |                   | Calculated |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Rainwater Harvesting - Wintergreen Elementary

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|  |                 |                   |             |
|--|-----------------|-------------------|-------------|
| Water Quality Event (in)               | 1.00            |                   | Input       |
|  | <b>Pervious</b> | <b>Impervious</b> |             |
| Drainage Area (sq ft)                  | 69              | 6,826             | Input       |
| Sub-basin CN                           | 80              | 98                | Input       |
| S (in)                                 | 2.50            | 0.20              | Calculated  |
| R/O (in)                               | 0.08            | 0.79              | Calculated  |
| Sub-basin WQ Volume (sf*in)            | 6               | 5399              | Calculated  |
| Sub-basin WQ Volume (cf)               | 0.5             | 450               | Calculated  |
|  |                 |                   |             |
| <b>Summary Calculations</b>            |                 |                   |             |
| Total Watershed area (sq ft)           | 6,895           |                   | Calculated  |
| Total Watershed area (acres)           | 0.16            |                   | Calculated  |
| Total WQ Runoff Volume (sf*in)         | 5,404           |                   | Calculated  |
| Total WQ Runoff Volume (cf)            | 450             |                   | Calculated  |
|  |                 |                   |             |
| <b>Cistern Volume Required</b>         |                 |                   |             |
| Average depth of water (in)            | 1               |                   | Input       |
| Surface area of contributing roof (sf) | 4,810           |                   | Calculated  |
| Volume of Cistern (cf)                 | 401             |                   | Calculated  |
| Volume of Cistern (gal)                | 2,998           |                   | Calculated  |
| Peak Flow Rate (cfs)                   | 0.90            |                   | 10-yr, 1 hr |
| Diameter of Cistern (ft)               | 6               |                   | Input       |
| Gutter slope, %                        | 1               |                   | Input       |
| Gutter diameter (in)                   | 8               |                   | Calculated  |
| Overflow Diameter (in)                 | 8               |                   | Calculated  |
| Structural Support Required?           | NO              |                   | Calculated  |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Water Quality Wetland - Belle Meade Apartments

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|   |                 |                   |            |
|---|-----------------|-------------------|------------|
| Water Quality Event (in)                | 1.00            |                   | Input      |
|   | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)                   | 266,200         | 266,200           | Input      |
| Sub-basin CN                            | 80              | 93                | Input      |
| S (in)                                  | 2.50            | 0.75              | Calculated |
| R/O (in)                                | 0.08            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)             | 22183           | 119893            | Calculated |
| Sub-basin WQ Volume (cf)                | 1849            | 9991              | Calculated |
| Runoff Coefficient, C                   | 0.23            | 0.80              | Input      |
|   |                 |                   |            |
| <b>Summary Calculations</b>             |                 |                   |            |
| Total Watershed area (sq ft)            | 532,400         |                   | Calculated |
| Total Watershed area (acres)            | 12.22           |                   | Calculated |
| Total WQ Runoff Volume (sf*in)          | 142,076         |                   | Calculated |
| Total WQ Runoff Volume (cf)             | 11,840          |                   | Calculated |
| Peak Flow, cfs                          | 50.61           |                   |            |
| Pipe Diameter, ft                       | 30.05           | <b>36"</b>        | Calculated |
|   |                 |                   |            |
| <b>Surface area of wetland</b>          |                 |                   |            |
| Average depth of water (in)             | 8               |                   | Input      |
| Surface area of wetland, required (sf)  | 17,760          |                   | Calculated |
| Surface area of wetland, required (ac)  | 0.408           |                   | Calculated |
| Surface area of wetland, available (sf) | 20,000          |                   | Input      |
| Surface area of wetland, available (ac) | 0.46            |                   | Input      |

# APPENDIX I BMP CONCEPTUAL DESIGN

## Permeable Pavement - Greenville Convention Center

Project: City of Greenville - Fork Swamp Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

| SITE DETAILS                   |         |          |
|--------------------------------|---------|----------|
| Initial Soil Infiltration Rate | 10      | (in/hr)  |
| Compaction?                    | Extreme |          |
| Site Slope, s                  | 0.013   | (ft/ft)  |
| Permeable Surface Area         | 47,360  | (sq. ft) |
| Lot Length (along slope)       | 330     | (ft)     |
| Lot width (on grade)           | 150.0   | (ft)     |
| Additional Contributing Area   | 124461  | (sq. ft) |
| Total Treatment Area           | 171,821 | (sq. ft) |
| Final Soil Infiltration Rate   | 0.5     | (in/hr)  |

| PAVEMENT SPECS                           |            |              |
|--|------------|--------------|
| Type                                     | PICP       |              |
| Paver Depth (Thickness)                  | 3.5        | (in)         |
| Surface Open Joint Space                 | 20         | (%)          |
| Initial Abstraction at Pavement Surface  | 0.01       | (in)         |
| SUBSURFACE LAYERS                        |            |              |
|  | Depth (in) | Porosity (%) |
| Fill Media                               | pea gravel | 20           |
| Bedding Layer                            | 2          | 40           |
| Base (aggregate)                         | 4          | 35           |
| Gravel casing layer (beneath underdrain) | 6          | (in)         |
| Total Pavement Depth                     | 15.5       | (in)         |
| Max H <sub>2</sub> O Storage             | 4.44       | (in)         |

|                     |    |
|---------------------|----|
| Underdrains Needed? | No |
|---------------------|----|

| Underdrain Sizing (if necessary - Check Above) |         |          |
|--|---------|----------|
| # of Underdrain Pipes                          | 1       |          |
| Pipe Slope (oriented along site slope)         | 0.013   | (ft/ft)  |
| Length of underdrain                           | 330     | (ft)     |
| Surface Infiltration Rate                      | 4       | (in/hr)  |
| Peak Flow (calc)                               | 378.13  | (cfs)    |
| Factor of Safety                               | 2       |          |
| Peak Flow (design)                             | 1512.50 | (cfs)    |
| Manning's n                                    | 0.015   |          |
| D  | 116.46  | (in)     |
| Drain Spacing                                  | 150.00  | (ft)     |
| Drainage Area                                  | 49500   | (sq. ft) |
| Pipe Diameter                                  | 0       | (in)     |

# **APPENDIX I**

## **BMP CONCEPTUAL DESIGN**

Underdrains are sized based on the surface infiltration rate



# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Bioretention Pond - Lynndale Ct

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|  |                 |                   |            |
|--|-----------------|-------------------|------------|
| Water Quality Event (in)                     | 1.00            |                   | Input      |
|  | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)                        | 5,095           | 45,855            | Input      |
| Sub-basin CN                                 | 74              | 93                | Input      |
| S (in)                                       | 3.51            | 0.75              | Calculated |
| R/O (in)                                     | 0.02            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)                  | 118             | 20652             | Calculated |
| Sub-basin WQ Volume (cf)                     | 10              | 1721              | Calculated |
| Runoff Coefficient, C                        | 0.23            | 0.80              | Input      |
|  |                 |                   |            |
| <b>Summary Calculations</b>                  |                 |                   |            |
| Total Watershed area (sq ft)                 | 50,950          |                   | Calculated |
| Total Watershed area (acres)                 | 1.17            |                   | Calculated |
| Total WQ Runoff Volume (sf*in)               | 20,771          |                   | Calculated |
| Total WQ Runoff Volume (cf)                  | 1,731           |                   | Calculated |
| Peak Flow, cfs                               | 6.99            |                   |            |
| Pipe Diameter, ft                            | 14.30           | 15"               | Calculated |
|  |                 |                   |            |
| <b>Surface area of bioretention</b>          |                 |                   |            |
| Average depth of water (in)                  | 10              |                   | Input      |
| Surface area of bioretention, required (sf)  | 2,077           |                   | Calculated |
| Surface area of bioretention, required (ac)  | 0.048           |                   | Calculated |
| Surface area of bioretention, available (sf) | 2,500           |                   | Input      |
| Surface area of bioretention, available (ac) | 0.06            |                   | Input      |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Wet Pond - Westhaven South

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|   |                 |                   |            |
|---|-----------------|-------------------|------------|
| Water Quality Event (in)                | 1.00            |                   | Input      |
|   | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)                   | 99,361          | 66,239            | Input      |
| Sub-basin CN                            | 74              | 93                | Input      |
| S (in)                                  | 3.51            | 0.75              | Calculated |
| R/O (in)                                | 0.02            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)             | 2305            | 29833             | Calculated |
| Sub-basin WQ Volume (cf)                | 192             | 2486              | Calculated |
| Runoff Coefficient, C                   | 0.23            | 0.80              | Input      |
|   |                 |                   |            |
| <b>Summary Calculations</b>             |                 |                   |            |
| Total Watershed area (sq ft)            | 165,600         |                   | Calculated |
| Total Watershed area (acres)            | 3.80            |                   | Calculated |
| Total WQ Runoff Volume (sf*in)          | 32,138          |                   | Calculated |
| Total WQ Runoff Volume (cf)             | 2,678           |                   | Calculated |
| Peak Flow, cfs                          | 14.00           |                   | Calculated |
| Pipe Diameter, ft                       | 18.56           | <b>24"</b>        | Calculated |
|   |                 |                   |            |
| <b>Surface area of wetland</b>          |                 |                   |            |
| Average depth of water (in)             | 8               |                   | Input      |
| Surface area of wetland, required (sf)  | 4,017           |                   | Calculated |
| Surface area of wetland, required (ac)  | 0.092           |                   | Calculated |
| Surface area of wetland, available (sf) | 4,500           |                   | Input      |
| Surface area of wetland, available (ac) | 0.10            |                   | Input      |

# APPENDIX I

## BMP CONCEPTUAL DESIGN

### Regenerative Stormwater Conveyance - Shamrock

Project: City of Greenville - Watershed Master Plan

Prepared by: SMB

Checked by: TLM

Date: 1/26/2016

#### DRAINAGE AREA INPUT PARAMETERS

|                                |                 |                   |            |
|--------------------------------|-----------------|-------------------|------------|
| Water Quality Event (in)       | 1.00            |                   | Input      |
|                                | <b>Pervious</b> | <b>Impervious</b> |            |
| Drainage Area (sq ft)          | 262,246         | 262,246           | Input      |
| Sub-basin CN                   | 74              | 93                | Input      |
| S (in)                         | 3.51            | 0.75              | Calculated |
| R/O (in)                       | 0.02            | 0.45              | Calculated |
| Sub-basin WQ Volume (sf*in)    | 6082            | 118112            | Calculated |
| Sub-basin WQ Volume (cf)       | 507             | 9843              | Calculated |
| Runoff Coefficient, C          | 0.23            | 0.80              | Input      |
|                                |                 |                   |            |
| <b>Summary Calculations</b>    |                 |                   |            |
| Total Watershed area (sq ft)   | 524,492         |                   | Calculated |
| Total Watershed area (acres)   | 12.04           |                   | Calculated |
| Total WQ Runoff Volume (sf*in) | 124,194         |                   | Calculated |
| Total WQ Runoff Volume (cf)    | 10,350          |                   | Calculated |
| Peak Flow, cfs                 | 49.86           |                   | Calculated |
|                                |                 |                   |            |
| <b>Surface area of RSC</b>     |                 |                   |            |
| Length of Channel, ft          | 70              |                   | Input      |
| Riffle Top Width, ft           | 25              |                   | Calculated |
| Riffle Depth, ft               | 1               |                   | Calculated |
| Pool Depth, ft                 | 2               |                   | Calculated |
| Number of Pools                | 3               |                   | Calculated |
| Surface Area of RSC (sf)       | 1,750           |                   | Calculated |











































|                    |                                 |
|--------------------|---------------------------------|
| Designer Engineer: | Stefani Barlow                  |
| Project Name:      | Fork Swamp - County Home Rd RSC |

\*Note: This sheet is based of a RSC (SPSC) design model created by Anne Arundel County, MD.

Input values shaded in Grey  
 Calculated values are shaded in blue  
 Check parameters in bold

| Checking the Channel Conveyance for the design flood                                 |                          |       |  |
|--|--------------------------|-------|--|
| Design Return Period (Yr)  | T                        | 100   | 10   |
| Time of Concentration in minutes (Before Development/Reference)                      | t <sub>c</sub>           |       | 5.00   |
| Post development (No SPSC) Runoff Curve Number                                       | RCN                      |       | 85.00  |
| Pre development discharge (cfs)  | Q <sub>pre</sub>         | 65.80 | 65.80  |
| Post development (No BMP) discharge (cfs)  | Q <sub>post</sub>        | 65.80 | 65.80  |
| Total available length (ft)  | L                        | 430   |  |
| Elevation drop over length (ft)  | delta E                  | 4.0   | Design Width (ft) 40.00  |
| Total Cascade length for project (ft)  | L <sub>cascade</sub>     | 0.00  | Design Depth (ft) 2.00   |
| Cascade Slope (ft/ft)  | Slope <sub>cascade</sub> | 0.50  | Roughness 0.05   |
| Water Quality slope (ft/ft)  | Slope                    | 0.01  | A 53.33  |
| Maximum Length of Riffle Channel/Weir (Not to exceed 6 ft)                           | L <sub>riffle</sub>      | 8.0   | q 0.20   |
| Number of riffle segments/boulder weirs for project                                  | N <sub>riffle</sub>      | 18    | P 0.00   |
| Number of pool segments for project  | N <sub>pool</sub>        | 18    | Rh 1.32  |
| Minimum required length of pool (ft)   | L <sub>pool</sub>        | 16    | Design Velocity (ft/sec) 26.05                                     |
| Enter a trial median cobble diameter (ft)  | d <sub>50</sub>          | 0.50  | Conveyed Q (cfs) 1389.44   |
| Minimum top width of SPSC riffle channel (ft)  | W                        | 50.0  | Cascade is adequate use 0 cascades                                 |
| Maximum depth of SPSC riffle channel 10H:1V cross-section (ft)                       | D                        | 1.0   | Minimum Pool Depth<br>*Use 3 pools* following<br>Cascade (ft) 1.80 |
| h <sub>r</sub> Minimum required dead storage depth within the pools of the SPSC (ft) | h <sub>r</sub>           | 1.5   | ok   |
| Enter desired pool depth (Maximum 3 ft)  | h <sub>i</sub>           | 2.0   |  |
| Check Riffle Side Slope, Must be > 10H:1V  |                          | 25.0  | subcritical/ok   |
| Check the Froude Number to ensure subcritical flow conditions                        |                          | 0.5   | Entrenchment ok  |
| Computed Roughness   | n                        | 0.05  |  |
| Riffle Cross Section Area (ft <sup>2</sup> ), for parabola                           | A                        | 33.33 | Pool Depth Adequate  |
| Theta - intermediate step for solving  | θ                        | 0.08  |  |
| Riffle Hydraulic Perimeter (ft), for parabola  | P                        | 50.05 |  |
| Riffle Hydraulic Radius (ft), using Chow 1959  | R <sub>h</sub>           | 0.67  |  |
| Calculated Flow for design parameters (cfs)  | Q                        | 74.90 |  |
| Check Riffle Velocity (ft/sec)   | V                        | 2.25  | Number of Pools (This is a preliminary estimate) 18                |
|  |                          |       | Provided cumulative pool depths (ft) = 20                          |

|                       |      |            |
|-----------------------|------|------------|
| Length of Channel, ft | 430  | Calculated |
| Riffle Top Width, ft  | 50.0 | Calculated |
| Riffle Depth, ft      | 1.0  | Calculated |
| Pool Depth, ft        | 2.0  | Calculated |
| Number of Pools       | 18   | Calculated |

**Choose D50 Cobble size = 6 inches**

| Ibsash curve for Stone Density = 165 lb/ft <sup>3</sup> |                                    |                                  |
|---|------------------------------------|----------------------------------|
| Cobble d50 size   | Allowable Velocity (Supercritical) | Allowable Velocity (Subcritical) |
| [inches]  | [ft/sec]                           | [ft/sec]                         |
| 4   | 5.1                                | 7.1                              |
| 5   | 5.7                                | 8.0                              |
| 6   | 6.3                                | 8.7                              |
| 7   | 6.8                                | 9.4                              |
| 8   | 7.2                                | 10.1                             |
| 9   | 7.7                                | 10.7                             |
| 10  | 8.1                                | 11.3                             |
| 11  | 8.5                                | 11.8                             |
| 12  | 8.8                                | 12.3                             |
| 15  | 9.9                                | 13.8                             |
| 18  | 10.8                               | 15.1                             |

Adequate conveyance of design storm  
 Selected Cobble Size is Adequate for 100 year storm  
 Subcritical Flow is Predominant  
 Entrenchment Ok.

**Cobble Gradation Table**

| PERCENTAGE PASSED | NO. OF PARTICLES PER TON OF STONE | PERCENTAGE RETAINED | NO. OF PARTICLES PER TON OF STONE |
|-------------------|-----------------------------------|---------------------|-----------------------------------|
| 100               | 100000                            | 0                   | 0                                 |
| 90                | 10000                             | 10                  | 10000                             |
| 80                | 1000                              | 20                  | 10000                             |
| 70                | 100                               | 30                  | 10000                             |
| 60                | 10                                | 40                  | 10000                             |
| 50                | 1                                 | 50                  | 10000                             |
| 40                | 0.1                               | 60                  | 10000                             |
| 30                | 0.01                              | 70                  | 10000                             |
| 20                | 0.001                             | 80                  | 10000                             |
| 10                | 0.0001                            | 90                  | 10000                             |
| 0                 | 0                                 | 100                 | 10000                             |

| Cascade Height (ft) | Maximum Allowable Cascade Slope (ft/ft) | Minimum Required Cascade length (ft) |
|---------------------|---|--------------------------------------|
| 4                   | 0.5                                     | 8                                    |
| 5                   | 0.5                                     | 10                                   |
| 6                   | 0.4                                     | 15                                   |
| 7                   | 0.3                                     | 23                                   |
| 8                   | 0.2                                     | 40                                   |
| 9                   | 0.1                                     | 90                                   |
| >10                 | 0.1                                     | >100                                 |

The cascade height is measured from the top of the cascade to the lowest point in the subsequent pool. Three full size pools are required at the bottom of a cascade.



|                    |                              |
|--------------------|------------------------------|
| Designer Engineer: | Stefani Barlow               |
| Project Name:      | Fork Swamp - Irish Creek RSC |

\*Note: This sheet is based of a RSC (SPSC) design model created by Anne Arundel County, MD.

Input values shaded in Grey  
 Calculated values are shaded in blue  
**Check parameters in bold**

| Checking the Channel Conveyance for the design flood                          |                   |             |  |        |
|---|-------------------|-------------|--|--------|
| Design Return Period (Yr)   | T                 | 100         | 10   | 1      |
| Time of Concentration in minutes (Before Development/Reference)               | $t_c$             |             | 5.00   |        |
| Post development (No SPSC) Runoff Curve Number                                | RCN               |             | 85.00  |        |
| Pre development discharge (cfs)   | $Q_{pre}$         | 28.40       | 28.40  | 28.40  |
| Post development (No BMP) discharge (cfs)                                     | $Q_{post}$        | 28.40       | 28.40  | 28.40  |
| Total available length (ft)   | L                 | 300         | <b>Cascade Design (maximum 5 ft drop per segment)</b>              |        |
| Elevation drop over length (ft)   | delta E           | 6.0         | Design Width (ft)  | 40.00  |
| Total Cascade length for project (ft)   | $L_{cascade}$     | 0.00        | Design Depth (ft)  | 1.00   |
| Cascade Slope (ft/ft)   | $Slope_{cascade}$ | 0.50        | Roughness  | 0.07   |
| Water Quality slope (ft/ft)   | Slope             | 0.02        | A  | 26.67  |
| Maximum Length of Riffle Channel/Weir (Not to exceed 8 ft)                    | $L_{riffle}$      | 8.0         | q  | 0.10   |
| Number of riffle segments/boulder weirs for project                           | $N_{riffle}$      | 13          | P  | 0.00   |
| Number of pool segments for project   | $N_{pool}$        | 13          | Rh   | 0.67   |
| Minimum required length of pool (ft)  | $L_{pool}$        | 16          | Design Velocity (ft/sec)   | 11.24  |
| Enter a trial median cobble diameter (ft)                                     | $d_{50}$          | 1.00        | Conveyed Q (cfs)   | 299.84 |
| Minimum top width of SPSC riffle channel (ft)                                 | W                 | 40.0        | Cascade is adequate, use 0 cascades                                |        |
| Maximum depth of SPSC riffle channel 10H:1V cross-section (ft)                | D                 | 1.0         | Minimum Pool Depth<br>"Use 3 pools" following<br>Cascade (ft) 0.80 |        |
| $h_r$ , Minimum required dead storage depth within the pools of the SPSC (ft) | $h_r$             | 1.5         | <b>ok</b>  |        |
| Enter desired pool depth (Maximum 3 ft)                                       | $h_i$             | 1.0         | subcritical/ok   |        |
| <b>Check Riffle Side Slope, Must be &gt; 10H:1V</b>                           |                   | <b>20.0</b> |  |        |
| <b>Check the Froude Number to ensure subcritical flow conditions</b>          |                   | <b>0.5</b>  | Entrenchment ok  |        |
| Computed Roughness  | n                 | 0.07        | Pool Depth Inadequate  |        |
| Riffle Cross Section Area (ft <sup>2</sup> ), for parabola                    | A                 | 26.67       |  |        |
| Theta - Intermediate step for solving   | $\theta$          | 0.10        |  |        |
| Riffle Hydraulic Perimeter (ft), for parabola                                 | P                 | 40.07       |  |        |
| Riffle Hydraulic Radius (ft), using Chow 1959                                 | $R_h$             | 0.67        |  |        |
| Calculated Flow for design parameters (cfs)                                   | Q                 | 59.97       |  |        |
| <b>Check Riffle Velocity (ft/sec)</b>   | V                 | <b>2.25</b> | Number of Pools (This is a preliminary estimate)                   | 13     |
|   |                   |             | Provided cumulative pool depths (ft) =                             | 14     |

Length of Channel, ft 300  
 Riffle Top Width, ft 40.0  
 Riffle Depth, ft 1.0  
 Pool Depth, ft 1.0  
 Number of Pools 13

**Choose D50 Cobble size = 12 inches**

| Isbash curve for Stone Density = 165 lb/ft <sup>3</sup> |                                    |                                  |
|---|------------------------------------|----------------------------------|
| Cobble d50 size   | Allowable Velocity (Supercritical) | Allowable Velocity (Subcritical) |
| [inches]  | [ft/sec]                           | [ft/sec]                         |
| 4   | 5.1                                | 7.1                              |
| 5   | 5.7                                | 8.0                              |
| 6   | 6.3                                | 8.7                              |
| 7   | 6.8                                | 9.4                              |
| 8   | 7.2                                | 10.1                             |
| 9   | 7.7                                | 10.7                             |
| 10  | 8.1                                | 11.3                             |
| 11  | 8.5                                | 11.8                             |
| 12  | 8.8                                | 12.3                             |
| 15  | 9.9                                | 13.8                             |
| 18  | 10.8                               | 15.1                             |

**Adequate conveyance of design storm**  
**Selected Cobble Size is Adequate for 100 year storm**  
**Subcritical Flow is Predominant**  
**Entrenchment Ok.**

**Cobble Gradation Table**

| U.S. Sieve Size (Nominal Size) | Maximum Allowable Percent Passing | Minimum Allowable Percent Passing | Maximum Allowable Percent Passing |
|--------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 4.75                           | 100                               | 100                               | 100                               |
| 7.5                            | 100                               | 100                               | 100                               |
| 12.5                           | 100                               | 100                               | 100                               |
| 19                             | 100                               | 100                               | 100                               |
| 25                             | 100                               | 100                               | 100                               |
| 37.5                           | 100                               | 100                               | 100                               |
| 47.5                           | 100                               | 100                               | 100                               |
| 60                             | 100                               | 100                               | 100                               |
| 75                             | 100                               | 100                               | 100                               |
| 100                            | 100                               | 100                               | 100                               |
| 150                            | 100                               | 100                               | 100                               |
| 200                            | 100                               | 100                               | 100                               |
| 250                            | 100                               | 100                               | 100                               |
| 300                            | 100                               | 100                               | 100                               |
| 354                            | 100                               | 100                               | 100                               |
| 425                            | 100                               | 100                               | 100                               |
| 500                            | 100                               | 100                               | 100                               |
| 600                            | 100                               | 100                               | 100                               |
| 750                            | 100                               | 100                               | 100                               |
| 900                            | 100                               | 100                               | 100                               |
| 1060                           | 100                               | 100                               | 100                               |
| 1250                           | 100                               | 100                               | 100                               |
| 1500                           | 100                               | 100                               | 100                               |
| 1800                           | 100                               | 100                               | 100                               |
| 2100                           | 100                               | 100                               | 100                               |
| 2400                           | 100                               | 100                               | 100                               |
| 2800                           | 100                               | 100                               | 100                               |
| 3300                           | 100                               | 100                               | 100                               |
| 3750                           | 100                               | 100                               | 100                               |
| 4250                           | 100                               | 100                               | 100                               |
| 4750                           | 100                               | 100                               | 100                               |
| 5250                           | 100                               | 100                               | 100                               |
| 5750                           | 100                               | 100                               | 100                               |
| 6300                           | 100                               | 100                               | 100                               |
| 6900                           | 100                               | 100                               | 100                               |
| 7500                           | 100                               | 100                               | 100                               |
| 8100                           | 100                               | 100                               | 100                               |
| 8700                           | 100                               | 100                               | 100                               |
| 9300                           | 100                               | 100                               | 100                               |
| 10000                          | 100                               | 100                               | 100                               |

| Cascade Height (ft) | Maximum Allowable Cascade Slope (ft/ft) | Minimum Required Cascade length (ft) |
|---------------------|---|--------------------------------------|
| 4                   | 0.5                                     | 8                                    |
| 5                   | 0.5                                     | 10                                   |
| 6                   | 0.4                                     | 15                                   |
| 7                   | 0.3                                     | 23                                   |
| 8                   | 0.2                                     | 40                                   |
| 9                   | 0.1                                     | 90                                   |
| >10                 | 0.1                                     | >100                                 |

The cascade height is measured from the top of the cascade to the lowest point in the subsequent pool. Three full size pools are required at the bottom of a cascade.



|                    |                           |
|--------------------|---------------------------|
| Designer Engineer: | Stefani Barlow            |
| Project Name:      | Fork Swamp - The Oaks RSC |

\*Note: This sheet is based of a RSC (SPSC) design model created by Anne Arundel County, MD.

Input values shaded in Grey

Calculated values are shaded in blue

**Check parameters in bold**

| Checking the Channel Conveyance for the design flood                                   |                          |             |   |        |
|--|--------------------------|-------------|---|--------|
| Design Return Period (Yr)  | T                        | 100         | 10  | 1      |
| Time of Concentration in minutes (Before Development/Reference)                        | t <sub>c</sub>           | 5.00        |   |        |
| Post development (No SPSC) Runoff Curve Number   | RCN                      | 85.00       |   |        |
| Pre development discharge (cfs)  | Q <sub>pre</sub>         | 18.55       | 18.55   | 18.55  |
| Post development (No BMP) discharge (cfs)  | Q <sub>post</sub>        | 18.55       | 18.55   | 18.55  |
| Total available length (ft)  | L                        | 380         | Cascade Design (maximum 5 ft drop per segment)                  |        |
| Elevation drop over length (ft)  | delta E                  | 3.0         | Design Width (ft)   | 20.00  |
| Total Cascade length for project (ft)  | L <sub>cascade</sub>     | 0.00        | Design Depth (ft)   | 1.00   |
| Cascade Slope (#ft)  | Slope <sub>cascade</sub> | 0.50        | Roughness   | 0.05   |
| Water Quality slope (#ft)  | Slope                    | 0.01        | A   | 13.33  |
| Maximum Length of Riffle Channel/Weir (Not to exceed 8 ft)                             | L <sub>rifle</sub>       | 8.0         | q   | 0.20   |
| Number of riffle segments/boulder weirs for project                                    | N <sub>rifle</sub>       | 16          | P   | 0.00   |
| Number of pool segments for project  | N <sub>pool</sub>        | 16          | Rh  | 0.66   |
| Minimum required length of pool (ft)   | L <sub>pool</sub>        | 16          | Design Velocity (ft/sec)  | 16.41  |
| Enter a trial median cobble diameter (ft)  | d <sub>50</sub>          | <b>0.50</b> | Conveyed Q (cfs)  | 218.82 |
| Minimum top width of SPSC riffle channel (ft)  | W                        | 20.0        | Cascade is adequate use 0 cascades                              |        |
| Maximum depth of SPSC riffle channel 10H:1V cross-section (ft)                         | D                        | 1.0         | Minimum Pool Depth<br>*Use 3 pools* following Cascade (ft) 0.80 |        |
| h <sub>i</sub> , Minimum required dead storage depth within the pools of the SPSC (ft) | h <sub>i</sub>           | <b>1.5</b>  | ok  |        |
| Enter desired pool depth (Maximum 3 ft)  | h <sub>t</sub>           | 1.0         | subcritical/ok  |        |
| Check Riffle Side Slope, Must be > 10H:1V  |                          | <b>10.0</b> |   |        |
| Check the Froude Number to ensure subcritical flow conditions                          |                          | <b>0.4</b>  | Entrenchment ok   |        |
| Computed Roughness   | n                        | 0.05        | Pool Depth Inadequate   |        |
| Riffle Cross Section Area (ft <sup>2</sup> ), for parabola                             | A                        | 13.33       |   |        |
| Theta - intermediate step for solving  | θ                        | 0.20        |   |        |
| Riffle Hydraulic Perimeter (ft), for parabola  | P                        | 20.13       |   |        |
| Riffle Hydraulic Radius (ft), using Chow 1959  | R <sub>h</sub>           | 0.66        |   |        |
| Calculated Flow for design parameters (cfs)  | Q                        | 27.50       |   |        |
| Check Riffle Velocity (ft/sec)   | V                        | <b>2.06</b> | Number of Pools (This is a preliminary estimate)                | 16     |
|  |                          |             | Provided cumulative pool depths (ft) =                          | 17     |

|                       |      |            |
|-----------------------|------|------------|
| Length of Channel, ft | 380  | Calculated |
| Riffle Top Width, ft  | 20.0 | Calculated |
| Riffle Depth, ft      | 1.0  | Calculated |
| Pool Depth, ft        | 1.0  | Calculated |
| Number of Pools       | 16   | Calculated |

**Choose D50 Cobble size = 6 inches**

Ishbash curve for Stone Density = 165 lb/ft<sup>3</sup>

| Cobble d50 size | Allowable Velocity (Supercritical) | Allowable Velocity (Subcritical) |
|-----------------|------------------------------------|----------------------------------|
| [inches]        | [ft/sec]                           | [ft/sec]                         |
| 4               | 5.1                                | 7.1                              |
| 5               | 5.7                                | 8.0                              |
| 6               | 6.3                                | 8.7                              |
| 7               | 6.8                                | 9.4                              |
| 8               | 7.2                                | 10.1                             |
| 9               | 7.7                                | 10.7                             |
| 10              | 8.1                                | 11.3                             |
| 11              | 8.5                                | 11.8                             |
| 12              | 8.8                                | 12.3                             |
| 15              | 9.9                                | 13.8                             |
| 18              | 10.8                               | 15.1                             |

Adequate conveyance of design storm  
Selected Cobble Size is Adequate for 100 year storm  
Subcritical Flow is Predominant  
Entrenchment Ok.

**Cobble Gradation Table**

| COBBLE SIZE RANGE (INCHES) | PERCENT PASSING THROUGH | PERCENT PASSING THROUGH | PERCENT PASSING THROUGH |
|----------------------------|-------------------------|-------------------------|-------------------------|
| 0.075                      | 100                     | 100                     | 100                     |
| 0.15                       | 100                     | 100                     | 100                     |
| 0.3                        | 100                     | 100                     | 100                     |
| 0.6                        | 100                     | 100                     | 100                     |
| 1.2                        | 100                     | 100                     | 100                     |
| 2.5                        | 100                     | 100                     | 100                     |
| 5.0                        | 100                     | 100                     | 100                     |
| 10                         | 100                     | 100                     | 100                     |
| 20                         | 100                     | 100                     | 100                     |
| 40                         | 100                     | 100                     | 100                     |
| 80                         | 100                     | 100                     | 100                     |
| 150                        | 100                     | 100                     | 100                     |
| 300                        | 100                     | 100                     | 100                     |
| 600                        | 100                     | 100                     | 100                     |
| 1200                       | 100                     | 100                     | 100                     |
| 2500                       | 100                     | 100                     | 100                     |
| 5000                       | 100                     | 100                     | 100                     |
| 10000                      | 100                     | 100                     | 100                     |

| Cascade Height (ft) | Maximum Allowable Cascade Slope (ft/ft) | Minimum Required Cascade length (ft) |
|---------------------|---|--------------------------------------|
| 4                   | 0.5                                     | 8                                    |
| 5                   | 0.5                                     | 10                                   |
| 6                   | 0.4                                     | 15                                   |
| 7                   | 0.3                                     | 23                                   |
| 8                   | 0.2                                     | 40                                   |
| 9                   | 0.1                                     | 90                                   |
| >10                 | 0.1                                     | >100                                 |

The cascade height is measured from the top of the cascade to the lowest point in the subsequent pool. Three full size pools are required at the bottom of a cascade.





|                    |                          |
|--------------------|--------------------------|
| Designer Engineer: | Stefani Barlow           |
| Project Name:      | Fork Swamp -Shamrock RSC |

\*Note: This sheet is based of a RSC (SPSC) design model created by Anne Arundel County, MD.

Input values shaded in Grey

Calculated values are shaded in blue

Check parameters in bold

| Checking the Channel Conveyance for the design flood                                 |                          |       |  |
|--|--------------------------|-------|--|
| Design Return Period (Yr)  | T                        | 100   | 10   |
| Time of Concentration in minutes (Before Development/Reference)                      | t <sub>c</sub>           |       | 5.00   |
| Post development (No SPSC) Runoff Curve Number                                       | RCN                      |       | 85.00  |
| Pre development discharge (cfs)  | Q <sub>pre</sub>         | 49.86 | 49.86  |
| Post development (No BMP) discharge (cfs)  | Q <sub>post</sub>        | 49.86 | 49.86  |
| Total available length (ft)  | L                        | 70    | Cascade Design (maximum 5 ft drop per segment)   |
| Elevation drop over length (ft)  | delta E                  | 5.0   |  |
| Total Cascade length for project (ft)  | L <sub>cascade</sub>     | 3.00  | Design Depth (ft) = 1.00   |
| Cascade Slope (ft/ft)  | Slope <sub>cascade</sub> | 0.50  | Roughness = 0.07   |
| Water Quality slope (ft/ft)  | Slope                    | 0.05  | A = 16.67  |
| Maximum Length of Riffle Channel/Weir (Not to exceed 8 ft)                           | L <sub>riffle</sub>      | 8.0   | q = 0.16   |
| Number of riffle segments/boulder weirs for project                                  | N <sub>riffle</sub>      | 3     | P = 0.00   |
| Number of pool segments for project  | N <sub>pool</sub>        | 3     | Rh = 0.66  |
| Minimum required length of pool (ft)   | L <sub>pool</sub>        | 16    | Design Velocity (ft/sec) = 11.22   |
| Enter a trial median cobble diameter (ft)  | d <sub>50</sub>          | 1.00  | Conveyed Q (cfs) = 187.08  |
| Minimum top width of SPSC riffle channel (ft)  | W                        | 25.0  | Cascade is adequate use 0 cascades<br>Minimum Pool Depth<br>*Use 3 pools* following<br>Cascade (ft) = 0.80 |
| Maximum depth of SPSC riffle channel 10H:1V cross-section (ft)                       | D                        | 1.0   |  |
| h <sub>i</sub> Minimum required dead storage depth within the pools of the SPSC (ft) | h <sub>i</sub>           | 1.5   | ok   |
| Enter desired pool depth (Maximum 3 ft)  | h <sub>d</sub>           | 2.0   | subcritical/ok   |
| Check Riffle Side Slope, Must be > 10H:1V  |                          | 12.5  | subcritical/ok   |
| Check the Froude Number to ensure subcritical flow conditions                        |                          | 0.8   | Entrenchment ok  |
| Computed Roughness   | n                        | 0.07  |  |
| Riffle Cross Section Area (ft <sup>2</sup> ), for parabola                           | A                        | 16.67 | Pool Depth Adequate  |
| Theta - Intermediate step for solving  | θ                        | 0.16  |  |
| Riffle Hydraulic Perimeter (ft), for parabola  | P                        | 25.11 |  |
| Riffle Hydraulic Radius (ft), using Chow 1959  | R <sub>h</sub>           | 0.66  |  |
| Calculated Flow for design parameters (cfs)  | Q                        | 60.47 |  |
| Check Riffle Velocity (ft/sec)   | V                        | 3.63  | Number of Pools (This is a preliminary<br>Provided cumulative pool depths (ft) =                           |
|  |                          |       | 3  |
|  |                          |       | 5  |

|                       |      |            |
|-----------------------|------|------------|
| Length of Channel, ft | 70   | Calculated |
| Riffle Top Width, ft  | 25.0 | Calculated |
| Riffle Depth, ft      | 1.0  | Calculated |
| Pool Depth, ft        | 2.0  | Calculated |
| Number of Pools       | 3    | Calculated |

Choose D50 Cobble size = 12 inches

| Irbash curve for Stone Density = 165 lb/ft <sup>3</sup> |                                    |                                  |
|---|------------------------------------|----------------------------------|
| Cobble d50 size   | Allowable Velocity (Supercritical) | Allowable Velocity (Subcritical) |
| [inches]  | [ft/sec]                           | [ft/sec]                         |
| 4   | 5.1                                | 7.1                              |
| 5   | 5.7                                | 8.0                              |
| 6   | 6.3                                | 8.7                              |
| 7   | 6.8                                | 9.4                              |
| 8   | 7.2                                | 10.1                             |
| 9   | 7.7                                | 10.7                             |
| 10  | 8.1                                | 11.3                             |
| 11  | 8.5                                | 11.8                             |
| 12  | 8.8                                | 12.3                             |
| 15  | 9.9                                | 13.8                             |
| 18  | 10.8                               | 15.1                             |

Adequate conveyance of design storm  
 Selected Cobble Size is Adequate for 100 year storm  
 Subcritical Flow is Predominant  
 Entrenchment Ok.

Cobble Gradation Table

| DESIGN GRADE PERCENTAGE | % OF MATERIAL PASSING THROUGH | PERCENT PASSING THROUGH | PERCENT PASSING THROUGH |
|-------------------------|-------------------------------|-------------------------|-------------------------|
| 100                     | 100                           | 100                     | 100                     |
| 90                      | 100                           | 100                     | 100                     |
| 80                      | 100                           | 100                     | 100                     |
| 70                      | 100                           | 100                     | 100                     |
| 60                      | 100                           | 100                     | 100                     |
| 50                      | 100                           | 100                     | 100                     |
| 40                      | 100                           | 100                     | 100                     |
| 30                      | 100                           | 100                     | 100                     |
| 20                      | 100                           | 100                     | 100                     |
| 10                      | 100                           | 100                     | 100                     |
| 0                       | 100                           | 100                     | 100                     |

| Cascade Height (ft) | Maximum Allowable Cascade Slope (ft/ft) | Minimum Required Cascade length (ft) |
|---------------------|---|--------------------------------------|
| 4                   | 0.5                                     | 8                                    |
| 5                   | 0.5                                     | 10                                   |
| 6                   | 0.4                                     | 15                                   |
| 7                   | 0.3                                     | 23                                   |
| 8                   | 0.2                                     | 40                                   |
| 9                   | 0.1                                     | 80                                   |
| >10                 | 0.1                                     | >100                                 |

The cascade height is measured from the top of the cascade to the lowest point in the subsequent pool. Three full size pools are required at the bottom of a cascade.



|                    |                |
|--------------------|----------------|
| Designer Engineer: | Stefani Barlow |
| Project Name:      | WGP Properties |

\*Note: This sheet is based of a RSC (SPSC) design model created by Anne Arundel County, MD.

Input values shaded in Grey

Calculated values are shaded in blue

Check parameters in bold

| Checking the Channel Conveyance for the design flood                                 |                          |       |  |
|--|--------------------------|-------|--|
| Design Return Period (Yr)  | T                        | 100   | 10   |
| Time of Concentration in minutes (Before Development/Reference)                      | t <sub>c</sub>           |       | 5.00   |
| Post development (No SPSC) Runoff Curve Number                                       | RCN                      |       | 85.00  |
| Pre development discharge (cfs)  | Q <sub>pre</sub>         | 28.40 | 28.40  |
| Post development (No BMP) discharge (cfs)  | Q <sub>post</sub>        | 28.40 | 28.40  |
| Total available length (ft)  | L                        | 60    |  |
| Elevation drop over length (ft)  | delta E                  | 4.0   | Design Width (ft) 30.00  |
| Total Cascade length for project (ft)  | L <sub>cascade</sub>     | 2.00  | Design Depth (ft) 1.00   |
| Cascade Slope (ft/ft)  | Slope <sub>cascade</sub> | 0.50  | Roughness 0.07   |
| Water Quality slope (ft/ft)  | Slope                    | 0.05  | A 20.00  |
| Maximum Length of Riffle Channel/Weir (Not to exceed 8 ft)                           | L <sub>riffle</sub>      | 8.0   | q 0.13   |
| Number of riffle segments/boulder weirs for project                                  | N <sub>riffle</sub>      | 3     | P 0.00   |
| Number of pool segments for project  | N <sub>pool</sub>        | 3     | Rh 0.66  |
| Minimum required length of pool (ft)   | L <sub>pool</sub>        | 16    | Design Velocity (ft/sec) 11.23                                     |
| Enter a trial median cobble diameter (ft)  | d <sub>50</sub>          | 1.00  | Conveyed Q (cfs) 224.69  |
| Minimum top width of SPSC riffle channel (ft)  | W                        | 20.0  | Cascade is adequate use 0 cascades                                 |
| Maximum depth of SPSC riffle channel 10H:1V cross-section (ft)                       | D                        | 1.0   | Minimum Pool Depth<br>*Use 3 pools* following<br>Cascade (ft) 0.80 |
| h <sub>r</sub> Minimum required dead storage depth within the pools of the SPSC (ft) | h <sub>r</sub>           | 1.5   | ok   |
| Enter desired pool depth (Maximum 3 ft)  | h <sub>i</sub>           | 2.0   | subcritical/ok   |
| Check Riffle Side Slope, Must be > 10H:1V  |                          | 10.0  |  |
| Check the Froude Number to ensure subcritical flow conditions                        |                          | 0.8   | Entrenchment ok  |
| Computed Roughness   | n                        | 0.07  |  |
| Riffle Cross Section Area (ft <sup>2</sup> ), for parabola                           | A                        | 13.33 | Pool Depth Adequate  |
| Theta - Intermediate step for solving  | θ                        | 0.20  |  |
| Riffle Hydraulic Perimeter (ft), for parabola  | P                        | 20.13 |  |
| Riffle Hydraulic Radius (ft), using Chow 1959  | R <sub>h</sub>           | 0.66  |  |
| Calculated Flow for design parameters (cfs)  | Q                        | 48.06 |  |
| Check Riffle Velocity (ft/sec)   | V                        | 3.60  | Number of Pools (This is a preliminary estimate) 3                 |
|  |                          |       | Provided cumulative pool depths (ft) = 5                           |

|                       |      |            |
|-----------------------|------|------------|
| Length of Channel, ft | 60   | Calculated |
| Riffle Top Width, ft  | 20.0 | Calculated |
| Riffle Depth, ft      | 1.0  | Calculated |
| Pool Depth, ft        | 2.0  | Calculated |
| Number of Pools       | 3    | Calculated |

Choose D50 Cobble size = 12 inches

| Isbash curve for Stone Density = 165 lb/ft <sup>3</sup> |                                    |                                  |
|---|------------------------------------|----------------------------------|
| Cobble d50 size   | Allowable Velocity (Supercritical) | Allowable Velocity (Subcritical) |
| [inches]  | [ft/sec]                           | [ft/sec]                         |
| 4   | 5.1                                | 7.1                              |
| 5   | 5.7                                | 8.0                              |
| 6   | 6.3                                | 8.7                              |
| 7   | 6.8                                | 9.4                              |
| 8   | 7.2                                | 10.1                             |
| 9   | 7.7                                | 10.7                             |
| 10  | 8.1                                | 11.3                             |
| 11  | 8.5                                | 11.8                             |
| 12  | 8.8                                | 12.3                             |
| 15  | 9.9                                | 13.8                             |
| 18  | 10.8                               | 15.1                             |

Adequate conveyance of design storm

Selected Cobble Size is Adequate for 100 year storm

Subcritical Flow is Predominant

Entrenchment Ok.

Cobble Gradation Table

| DESIGN PERCENT PASSING THROUGH SIEVE | % OF MATERIAL FINER THAN SIEVE (NO. 100) | PERCENT PASSING THROUGH SIEVE (NO. 40) | PERCENT PASSING THROUGH SIEVE (NO. 20) |
|--------------------------------------|--|--|--|
| 0                                    | 100                                      | 100                                    | 100                                    |
| 5                                    | 100                                      | 100                                    | 100                                    |
| 10                                   | 100                                      | 100                                    | 100                                    |
| 15                                   | 100                                      | 100                                    | 100                                    |
| 20                                   | 100                                      | 100                                    | 100                                    |

| Cascade Height (ft) | Maximum Allowable Cascade Slope (ft/ft) | Minimum Required Cascade length (ft) |
|---------------------|---|--------------------------------------|
| 4                   | 0.5                                     | 8                                    |
| 5                   | 0.5                                     | 10                                   |
| 6                   | 0.4                                     | 15                                   |
| 7                   | 0.3                                     | 23                                   |
| 8                   | 0.2                                     | 40                                   |
| 9                   | 0.1                                     | 90                                   |
| >10                 | 0.1                                     | >100                                 |

The cascade height is measured from the top of the cascade to the lowest point in the subsequent pool. Three full size pools are required at the bottom of a cascade.



|                           |   |
|---------------------------|---|
| <b>Designer Engineer:</b> | Stefani Barlow                          |
| <b>Project Name:</b>      | Fork Swamp - Wintergreen Elementary RSC |

\*Note: This sheet is based of a RSC (SPSC) design model created by Anne Arundel County, MD.

Input values shaded in Grey

Calculated values are shaded in blue

**Check parameters in bold**

| Checking the Channel Conveyance for the design flood                        |                   |             |  |        |
|---|-------------------|-------------|--|--------|
| Design Return Period (Yr)   | T                 | 100         | 10   | 1      |
| Time of Concentration in minutes (Before Development/Reference)             | $t_c$             |             | 5.00   |        |
| Post development (No SPSC) Runoff Curve Number                              | RCN               |             | 85.00  |        |
| Pre development discharge (cfs)   | $Q_{pre}$         | 85.74       | 85.74  | 85.74  |
| Post development (No BMP) discharge (cfs)                                   | $Q_{post}$        | 85.74       | 85.74  | 85.74  |
| <b>Cascade Design (maximum 5 ft drop per segment)</b>                       |                   |             |  |        |
| Total available length (ft)   | L                 | 120         |  |        |
| Elevation drop over length (ft)   | delta E           | 4.0         | Design Width (ft)                                | 30.00  |
| Total Cascade length for project (ft)                                       | $L_{cascade}$     | 0.00        | Design Depth (ft)                                | 1.00   |
| Cascade Slope (ft/ft)   | $Slope_{cascade}$ | 0.50        | Roughness  | 0.05   |
| Water Quality slope (ft/ft)   | Slope             | 0.03        | A  | 20.00  |
| Maximum Length of Riffle Channel/Weir (Not to exceed 8 ft)                  | $L_{riffle}$      | 5.0         | q  | 0.13   |
| Number of riffle segments/boulder weirs for project                         | $N_{riffle}$      | 8           | P  | 0.00   |
| Number of pool segments for project   | $N_{pool}$        | 8           | Rh   | 0.66   |
| Minimum required length of pool (ft)  | $L_{pool}$        | 10          | Design Velocity (ft/sec)                         | 16.45  |
| Enter a trial median cobble diameter (ft)                                   | $d_{50}$          | <b>0.50</b> | Conveyed Q (cfs)                                 | 329.04 |
| Minimum top width of SPSC riffle channel (ft)                               | W                 | 35.0        | Cascade is adequate use 0 cascades               |        |
| Maximum depth of SPSC riffle channel 10H:1V cross-section (ft)              | D                 | 1.0         | Minimum Pool Depth                               | 0.80   |
| $h_s$ Minimum required dead storage depth within the pools of the SPSC (ft) | $h_s$             | 1.5         | <b>ok</b>  |        |
| Enter desired pool depth (Maximum 3 ft)                                     | $h_p$             | 2.0         | subcritical/ok                                   |        |
| <b>Check Riffle Side Slope, Must be &gt; 10H:1V</b>                         |                   | <b>17.5</b> | Entrenchment ok                                  |        |
| <b>Check the Froude Number to ensure subcritical flow conditions</b>        |                   | <b>0.9</b>  | Entrenchment ok                                  |        |
| Computed Roughness  | n                 | 0.05        | Pool Depth Adequate                              |        |
| Riffle Cross Section Area (ft <sup>2</sup> ), for parabola                  | A                 | 23.33       |  |        |
| Theta - intermediate step for solving                                       | $\theta$          | 0.11        |  |        |
| Riffle Hydraulic Perimeter (ft), for parabola                               | P                 | 35.08       |  |        |
| Riffle Hydraulic Radius (ft), using Chow 1959                               | $R_h$             | 0.67        |  |        |
| Calculated Flow for design parameters (cfs)                                 | Q                 | 99.17       |  |        |
| <b>Check Riffle Velocity (ft/sec)</b>                                       | V                 | <b>4.25</b> | Number of Pools (This is a preliminary estimate) | 8      |
|   |                   |             | Provided cumulative pool depths (ft) =           | 10     |

|                       |      |            |
|-----------------------|------|------------|
| Length of Channel, ft | 120  | Calculated |
| Riffle Top Width, ft  | 35.0 | Calculated |
| Riffle Depth, ft      | 1.0  | Calculated |
| Pool Depth, ft        | 2.0  | Calculated |
| Number of Pools       | 8    | Calculated |

**Choose D50 Cobble size = 6 inches**

| Irbash curve for Stone Density = 165 lb/ft <sup>3</sup> |                                    |                                  |
|---|------------------------------------|----------------------------------|
| Cobble d50 size   | Allowable Velocity (Supercritical) | Allowable Velocity (Subcritical) |
| [inches]  | [ft/sec]                           | [ft/sec]                         |
| 4   | 5.1                                | 7.1                              |
| 5   | 5.7                                | 8.0                              |
| 6   | 6.3                                | 8.7                              |
| 7   | 6.8                                | 9.4                              |
| 8   | 7.2                                | 10.1                             |
| 9   | 7.7                                | 10.7                             |
| 10  | 8.1                                | 11.3                             |
| 11  | 8.5                                | 11.8                             |
| 12  | 8.8                                | 12.3                             |
| 15  | 9.9                                | 13.8                             |
| 18  | 10.8                               | 15.1                             |

**Adequate conveyance of design storm**

**Selected Cobble Size is Adequate for 100 year storm**

**Subcritical Flow is Predominant**

**Entrenchment Ok.**

**Cobble Gradation Table**

| GRAVEL PERCENT BY WEIGHT | % OF MATERIAL FINER THAN TYPICAL SIZES | PERCENT PASSING PERCENT 20 (0.075mm) | PERCENT PASSING PERCENT 40 (0.075mm) |
|--------------------------|--|--------------------------------------|--------------------------------------|
| 100                      | 100                                    | 100                                  | 100                                  |
| 90                       | 100                                    | 100                                  | 100                                  |
| 80                       | 100                                    | 100                                  | 100                                  |
| 70                       | 100                                    | 100                                  | 100                                  |
| 60                       | 100                                    | 100                                  | 100                                  |
| 50                       | 100                                    | 100                                  | 100                                  |
| 40                       | 100                                    | 100                                  | 100                                  |
| 30                       | 100                                    | 100                                  | 100                                  |
| 20                       | 100                                    | 100                                  | 100                                  |
| 10                       | 100                                    | 100                                  | 100                                  |
| 0                        | 100                                    | 100                                  | 100                                  |

| Cascade Height (ft) | Maximum Allowable Cascade Slope (ft/ft) | Minimum Required Cascade length (ft) |
|---------------------|---|--------------------------------------|
| 4                   | 0.5                                     | 8                                    |
| 5                   | 0.5                                     | 10                                   |
| 6                   | 0.4                                     | 15                                   |
| 7                   | 0.3                                     | 23                                   |
| 8                   | 0.2                                     | 40                                   |
| 9                   | 0.1                                     | 90                                   |
| >10                 | 0.1                                     | >100                                 |

The cascade height is measured from the top of the cascade to the lowest point in the subsequent pool. Three full size pools are required at the bottom of a cascade.

---

## Appendix J:

# Digital Copy of Hydrologic and Hydraulic Models

### List of Contents:

1. Primary System HEC-HMS Model (2-,10-,25-,50-, and 100-Year Storms)
  - a. Existing Conditions
  - b. Future Conditions
  - c. Alternative

2. Primary System HEC-RAS Models (2-,10-,25-,50-, and 100-Year Storms)
  - a. Fork Swamp Main Branch
  - b. Fork Swamp UT1
  - c. Fork Swamp UT2R1 and UT2R2
  - d. Fork Swamp UT3

*\* The models include Existing and Future Conditions, as well as Alternative where applicable\**

3. Secondary System SWMM Models (2-,10-,25-,50-, and 100-Year Storms)
  - a. Existing Conditions
    - i. Corey Road
  - b. Alternative
    - i. Corey Road

4. Secondary System Hydraflow Storm Sewers (2-,10-,25-,50-, and 100-Year Storms)
    - a. Existing Conditions
      - i. Trafalgar Drive
-

**DIGITAL COPY OF  
HYDROLOGIC AND  
HYDRAULIC MODELS  
PROVIDED ON CD**

---

## **Appendix K:**

### **Stream Assessment**

#### List of Contents:

1. Stream Assessment Summary Table
2. Bank Erosion Hazard Index Output
3. Channel Stability Assessment Scores
4. Channel Stability Assessment Form

| Assessment Number | BEHI Score | BEHI Rating | Stability Score | Stability Rating | Stream Reach                   |
|-------------------|------------|-------------|-----------------|------------------|--------------------------------|
| 1                 | 40.70      | Very High   | 110             | Poor             | Fork Swamp BEHI 1 (above park) |
| 2                 | 39.60      | Very High   | 88              | Fair             | Fork Swamp BEHI 2              |
| 3                 | 34.90      | High        | 92              | Fair             | Fork Swamp BEHI 3              |
| 4                 | 36.70      | High        | 86              | Fair             | Fork Swamp BEHI 4              |
| 11                | 25.80      | Moderate    | 100             | Poor             | UT1-FS BEHI (Ag Field)         |
| 10                | 30.50      | High        | 78              | Fair             | UT1-FS BEHI (Residential)      |
| 12                | 41.60      | Very High   | 69              | Fair             | UT1-FS BEHI (Forested)         |
| 15                | 43.60      | Very High   | 85              | Fair             | UT1-SC BEHI                    |
| 17                | 41.60      | Very High   | 69              | Fair             | UT2-FS BEHI 1                  |
| 16                | 38.30      | High        | 74              | Fair             | UT2-FS BEHI 2 (upstream reach) |
| 19                | 29.80      | High        | 68              | Fair             | UT3- FS (3)                    |
| 20                | 41.90      | Very High   | 96              | Fair             | UT3- FS (4)                    |
| 21                | 39.30      | High        | 86              | Fair             | UT3- FS (5)                    |
| 18                | 40.70      | Very High   | 98              | Fair             | UT3-FS (2)                     |
| 22                | 43.10      | Very High   | 99              | Fair             | UT4-FS (1)                     |

**Bank Erosion Hazard Rating Guide**

| Stream                        |                   | Fork Swamp BEHI 1           |      | Assesment # 1              |      | Date 8/11/2014    |      | Crew BSH, BPB, WAM      |        |   |      |             |
|-------------------------------|-------------------|-----------------------------|------|----------------------------|------|-------------------|------|-------------------------|--------|---|------|-------------|
| <b>Bank Erosion Potential</b> | Bank Height (ft): | Bank Height/<br>Bankfull Ht |      | Root Depth/<br>Bank Height |      | Root<br>Density % |      | Bank Angle<br>(Degrees) |        | Surface<br>Protection%                      |      |             |
|                               | VERY LOW          | Value<br>1.0-1.1            | 0.00 | 1.0-0.9                    | 0.00 | 100-80            | 0.00 | 0-20                    | 100-80 | 80.00                                       |      |             |
|                               |                   | Index<br>1.0-1.9            | 0.00 | 1.0-1.9                    | 0.00 | 1.0-1.9           | 0.00 | 1.0-1.9                 | 0.00   | 1.0-1.9                                     | 1.90 |             |
|                               | LOW               | Value<br>1.11-1.19          | 0.00 | 0.89-0.5                   | 0.00 | 79-55             | 0.00 | 21-60                   | 79-55  | 0.00  |      |             |
|                               |                   | Index<br>2.0-3.9            | 0.00 | 2.0-3.9                    | 0.00 | 2.0-3.9           | 0.00 | 2.0-3.9                 | 0.00   | 2.0-3.9                                     | 0.00 |             |
|                               | MODERATE          | Value<br>1.2-1.5            | 0.00 | 0.49-0.3                   | 0.00 | 54-30             | 0.00 | 61-80                   | 54-30  | 0.00  |      |             |
|                               |                   | Index<br>4.0-5.9            | 0.00 | 4.0-5.9                    | 0.00 | 4.0-5.9           | 0.00 | 4.0-5.9                 | 4.90   | 4.0-5.9                                     | 0.00 |             |
|                               | HIGH              | Value<br>1.6-2.0            | 2.00 | 0.29-0.15                  | 0.29 | 29-15             | 0.00 | 81-90                   | 29-15  | 0.00  |      |             |
|                               |                   | Index<br>6.0-7.9            | 7.90 | 6.0-7.9                    | 6.00 | 6.0-7.9           | 0.00 | 6.0-7.9                 | 0.00   | 6.0-7.9                                     | 0.00 |             |
|                               | VERY HIGH         | Value<br>2.1-2.8            | 0.00 | 0.14-0.05                  | 0.00 | 14-5.0            | 0.00 | 91-119                  | 14-10  | 0.00  |      |             |
|                               |                   | Index<br>8.0-9.0            | 0.00 | 8.0-9.0                    | 0.00 | 8.0-9.0           | 0.00 | 8.0-9.0                 | 0.00   | 8.0-9.0                                     | 0.00 |             |
|                               | EXTREME           | Value<br>>2.8               | 0.00 | <0.05                      | 0.00 | <5                | 2.90 | >119                    | <10    | 0.00  |      |             |
|                               | Index<br>10       | 0.00                        | 10   | 0.00                       | 10   | 10.00             | 10   | 10                      | 0.00   |   |      |             |
| V = value, I = index          |                   |                             |      |                            |      |                   |      |                         |        | SUB-TOTAL (Sum one index from each column): |      | <b>30.7</b> |

|  |           |
|--|-----------|
| <b>Bank Material Description:</b>  |           |
| Bank Materials   |           |
| Bedrock (Bedrock banks have very low bank erosion potential)   |           |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |           |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |           |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |           |
| Sand (Add 10 points)   |           |
| Silt Clay (+ 0: no adjustment)   |           |
| BANK MATERIAL ADJUSTMENT:  | <b>10</b> |

|  |  |
|--|--|
| <b>Stratification Comments:</b>  |  |
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

| VERY LOW                               | LOW     | MODERATE | HIGH    | VERY HIGH | EXTREME      |                  |
|--|---------|----------|---------|-----------|--------------|------------------|
| 5-9.5                                  | 10-19.5 | 20-29.5  | 30-39.5 | 40-45     | 46-50        |                  |
| Bank location description (circle one) |         |          |         |           | GRAND TOTAL: | <b>40.7</b>      |
| Straight Reach                         |         |          |         |           | BEHI RATING: | <b>VERY HIGH</b> |
| Outside of Bend                        |         |          |         |           |              |                  |



**Bank Erosion Hazard Rating Guide**

| Stream                 |                   | Fork Swamp BEHI 2           |           | Assessment #               |           | 2                 |         | Date                    |         | Crew                   |   |       |             |
|------------------------|-------------------|-----------------------------|-----------|----------------------------|-----------|-------------------|---------|-------------------------|---------|------------------------|---|-------|-------------|
| Bank Erosion Potential | Bank Height (ft): | Bank Height/<br>Bankfull Ht |           | Root Depth/<br>Bank Height |           | Root<br>Density % |         | Bank Angle<br>(Degrees) |         | Surface<br>Protection% |   |       |             |
|                        | VERY LOW          | Value                       | 1.0-1.1   |                            | 1.0-0.9   |                   | 100-80  |                         | 0-20    |                        | 100-80                                      | 75.00 |             |
|                        |                   | Index                       | 1.0-1.9   | 0.00                       | 1.0-1.9   | 0.00              | 1.0-1.9 | 0.00                    | 1.0-1.9 | 0.00                   | 1.0-1.9                                     | 2.13  |             |
|                        | LOW               | Value                       | 1.11-1.19 |                            | 0.89-0.5  |                   | 79-55   |                         | 21-60   |                        | 79-55                                       |       |             |
|                        |                   | Index                       | 2.0-3.9   | 0.00                       | 2.0-3.9   | 0.00              | 2.0-3.9 | 0.00                    | 2.0-3.9 | 0.00                   | 2.0-3.9                                     | 0.00  |             |
|                        | MODERATE          | Value                       | 1.2-1.5   |                            | 0.49-0.3  | 0.42              | 54-30   |                         | 61-80   | 70.00                  | 54-30                                       |       |             |
|                        |                   | Index                       | 4.0-5.9   | 0.00                       | 4.0-5.9   | 4.70              | 4.0-5.9 | 0.00                    | 4.0-5.9 | 4.90                   | 4.0-5.9                                     | 0.00  |             |
|                        | HIGH              | Value                       | 1.6-2.0   | 2.00                       | 0.29-0.15 |                   | 29-15   |                         | 81-90   |                        | 29-15                                       |       |             |
|                        |                   | Index                       | 6.0-7.9   | 7.90                       | 6.0-7.9   | 0.00              | 6.0-7.9 | 0.00                    | 6.0-7.9 | 0.00                   | 6.0-7.9                                     | 0.00  |             |
|                        | VERY HIGH         | Value                       | 2.1-2.8   |                            | 0.14-0.05 |                   | 14-5.0  |                         | 91-119  |                        | 14-10                                       |       |             |
|                        | Index             | 8.0-9.0                     | 0.00      | 8.0-9.0                    | 0.00      | 8.0-9.0           | 0.00    | 8.0-9.0                 | 0.00    | 8.0-9.0                | 0.00  |       |             |
| EXTREME                | Value             | >2.8                        |           | <0.05                      |           | <5                | 2.10    | >119                    |         | <10                    |   |       |             |
|                        | Index             | 10                          | 0.00      | 10                         | 0.00      | 10                | 10.00   | 10                      | 0.00    | 10                     | 0.00  |       |             |
| V = value, I = index   |                   |                             |           |                            |           |                   |         |                         |         |                        | SUB-TOTAL (Sum one index from each column): |       | <b>29.6</b> |

**Bank Material Description:**

Bank Materials

- Bedrock (Bedrock banks have very low bank erosion potential)
- Boulders (Banks composed of boulders have low bank erosion potential)
- Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust)
- Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)
- Sand (Add 10 points)
- Silt Clay (+ 0: no adjustment)

BANK MATERIAL ADJUSTMENT: **10**

**Stratification Comments:**

Stratification

Add 5-10 points depending on position of unstable layers in relation to bankfull stage

STRATIFICATION ADJUSTMENT: **0**

| VERY LOW                               | LOW     | MODERATE | HIGH    | VERY HIGH | EXTREME      |                  |
|--|---------|----------|---------|-----------|--------------|------------------|
| 5-9.5                                  | 10-19.5 | 20-29.5  | 30-39.5 | 40-45     | 46-50        |                  |
| Bank location description (circle one) |         |          |         |           | GRAND TOTAL: | <b>39.6</b>      |
| Straight Reach                         |         |          |         |           | BEHI RATING: | <b>VERY HIGH</b> |
| Outside of Bend                        |         |          |         |           |              |                  |

**Bank Erosion Hazard Rating Guide**

| Stream                 |           | Fork Swamp BEHI 3                     |           | Assessment #               |         | 3                 |         | Date 8/11/2014          |         | Crew  |  | BSH, BPB    |  |
|------------------------|-----------|---------------------------------------|-----------|----------------------------|---------|-------------------|---------|-------------------------|---------|---|--|-------------|--|
| Bank Height (ft):      |           | Bank Height/<br>Bankfull Height (ft): |           | Root Depth/<br>Bank Height |         | Root<br>Density % |         | Bank Angle<br>(Degrees) |         | Surface<br>Protection%                      |  |             |  |
| Bank Erosion Potential | VERY LOW  | Value                                 | 1.0-1.1   | 1.0-0.9                    | 100-80  | 0-20              | 100-80  | 0-20                    | 100-80  | 80.00                                       |  |             |  |
|                        |           | Index                                 | 1.0-1.9   | 0.00                       | 1.0-1.9 | 0.00              | 1.0-1.9 | 0.00                    | 1.0-1.9 | 1.90  |  |             |  |
|                        | LOW       | Value                                 | 1.11-1.19 | 0.89-0.5                   | 79-55   | 21-60             | 79-55   | 21-60                   | 79-55   | 0.00  |  |             |  |
|                        |           | Index                                 | 2.0-3.9   | 4.14                       | 2.0-3.9 | 2.0-3.9           | 2.0-3.9 | 0.00                    | 2.0-3.9 | 0.00  |  |             |  |
|                        | MODERATE  | Value                                 | 1.2-1.5   | 0.49-0.3                   | 54-30   | 61-80             | 54-30   | 61-80                   | 54-30   | 0.00  |  |             |  |
|                        |           | Index                                 | 4.0-5.9   | 0.00                       | 4.0-5.9 | 0.00              | 4.0-5.9 | 0.00                    | 4.0-5.9 | 0.00  |  |             |  |
|                        | HIGH      | Value                                 | 1.6-2.0   | 0.29-0.15                  | 29-15   | 81-90             | 29-15   | 90.00                   | 29-15   | 0.00  |  |             |  |
|                        |           | Index                                 | 6.0-7.9   | 0.00                       | 6.0-7.9 | 0.00              | 6.0-7.9 | 7.90                    | 6.0-7.9 | 0.00  |  |             |  |
|                        | VERY HIGH | Value                                 | 2.1-2.8   | 0.14-0.05                  | 14-5.0  | 11.25             | 14-5.0  | 11.25                   | 14-10   | 0.00  |  |             |  |
|                        |           | Index                                 | 8.0-9.0   | 0.00                       | 8.0-9.0 | 0.00              | 8.0-9.0 | 8.31                    | 8.0-9.0 | 0.00  |  |             |  |
|                        | EXTREME   | Value                                 | >2.8      | <0.05                      | <5      | >119              | <5      | >119                    | <10     | 0.00  |  |             |  |
|                        |           | Index                                 | 10        | 0.00                       | 10      | 0.00              | 10      | 0.00                    | 10      | 0.00  |  |             |  |
| V = value, I = index   |           |                                       |           |                            |         |                   |         |                         |         | SUB-TOTAL (Sum one index from each column): |  | <b>24.9</b> |  |

|  |           |
|--|-----------|
| <b>Bank Material Description:</b>  |           |
| Bank Materials   |           |
| Bedrock (Bedrock banks have very low bank erosion potential)   |           |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |           |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |           |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |           |
| Sand (Add 10 points)   |           |
| Silt Clay (+ 0: no adjustment)   |           |
| BANK MATERIAL ADJUSTMENT:  | <b>10</b> |

|  |  |
|--|--|
| <b>Stratification Comments:</b>  |  |
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

|  |            |                 |             |                  |                |
|--|------------|-----------------|-------------|------------------|----------------|
| <b>VERY LOW</b>                        | <b>LOW</b> | <b>MODERATE</b> | <b>HIGH</b> | <b>VERY HIGH</b> | <b>EXTREME</b> |
| 5-9.5                                  | 10-19.5    | 20-29.5         | 30-39.5     | 40-45            | 46-50          |
| Bank location description (circle one) |            |                 |             |                  | GRAND TOTAL:   |
| Straight Reach                         |            | Outside of Bend |             |                  | BEHI RATING:   |
|  |            |                 |             |                  | <b>34.9</b>    |
|  |            |                 |             |                  | <b>HIGH</b>    |

**Bank Erosion Hazard Rating Guide**

| Stream                 |                   | Fork Swamp BEHI 4           |           | Assessment #               |           | 4                 |         | Date 8/11/2014          |         | Crew                   |   | BSH, BPB |             |
|------------------------|-------------------|-----------------------------|-----------|----------------------------|-----------|-------------------|---------|-------------------------|---------|------------------------|---|----------|-------------|
| Bank Erosion Potential | Bank Height (ft): | Bank Height/<br>Bankfull Ht |           | Root Depth/<br>Bank Height |           | Root<br>Density % |         | Bank Angle<br>(Degrees) |         | Surface<br>Protection% |   |          |             |
|                        | VERY LOW          | Value                       | 1.0-1.1   |                            | 1.0-0.9   |                   | 100-80  |                         | 0-20    |                        | 100-80                                      | 75.00    |             |
|                        |                   | Index                       | 1.0-1.9   | 0.00                       | 1.0-1.9   | 0.00              | 1.0-1.9 | 0.00                    | 1.0-1.9 | 0.00                   | 1.0-1.9                                     | 2.13     |             |
|                        | LOW               | Value                       | 1.11-1.19 |                            | 0.89-0.5  |                   | 79-55   |                         | 21-60   |                        | 79-55                                       |          |             |
|                        |                   | Index                       | 2.0-3.9   | 0.00                       | 2.0-3.9   | 0.00              | 2.0-3.9 | 0.00                    | 2.0-3.9 | 0.00                   | 2.0-3.9                                     | 0.00     |             |
|                        | MODERATE          | Value                       | 1.2-1.5   | 1.45                       | 0.49-0.3  | 0.46              | 54-30   |                         | 61-80   | 80.00                  | 54-30                                       |          |             |
|                        |                   | Index                       | 4.0-5.9   | 5.58                       | 4.0-5.9   | 4.30              | 4.0-5.9 | 0.00                    | 4.0-5.9 | 5.90                   | 4.0-5.9                                     | 0.00     |             |
|                        | HIGH              | Value                       | 1.6-2.0   |                            | 0.29-0.15 |                   | 29-15   |                         | 81-90   |                        | 29-15                                       |          |             |
|                        |                   | Index                       | 6.0-7.9   | 0.00                       | 6.0-7.9   | 0.00              | 6.0-7.9 | 0.00                    | 6.0-7.9 | 0.00                   | 6.0-7.9                                     | 0.00     |             |
|                        | VERY HIGH         | Value                       | 2.1-2.8   |                            | 0.14-0.05 |                   | 14-5.0  | 6.82                    | 91-119  |                        | 14-10                                       |          |             |
|                        | Index             | 8.0-9.0                     | 0.00      | 8.0-9.0                    | 0.00      | 8.0-9.0           | 8.80    | 8.0-9.0                 | 0.00    | 8.0-9.0                | 0.00  |          |             |
| EXTREME                | Value             | >2.8                        |           | <0.05                      |           | <5                |         | >119                    |         | <10                    |   |          |             |
|                        | Index             | 10                          | 0.00      | 10                         | 0.00      | 10                | 0.00    | 10                      | 0.00    | 10                     | 0.00  |          |             |
| V = value, I = index   |                   |                             |           |                            |           |                   |         |                         |         |                        | SUB-TOTAL (Sum one index from each column): |          | <b>26.7</b> |

|  |           |
|--|-----------|
| <b>Bank Material Description:</b>  |           |
| Bank Materials   |           |
| Bedrock (Bedrock banks have very low bank erosion potential)   |           |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |           |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |           |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |           |
| Sand (Add 10 points)   |           |
| Silt Clay (+ 0: no adjustment)   |           |
| BANK MATERIAL ADJUSTMENT:  | <b>10</b> |

|  |  |
|--|--|
| <b>Stratification Comments:</b>  |  |
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

|  |            |                 |             |                  |                |
|--|------------|-----------------|-------------|------------------|----------------|
| <b>VERY LOW</b>                        | <b>LOW</b> | <b>MODERATE</b> | <b>HIGH</b> | <b>VERY HIGH</b> | <b>EXTREME</b> |
| 5-9.5                                  | 10-19.5    | 20-29.5         | 30-39.5     | 40-45            | 46-50          |
| Bank location description (circle one) |            |                 |             |                  | GRAND TOTAL:   |
| Straight Reach                         |            | Outside of Bend |             |                  | BEHI RATING:   |
|  |            |                 |             |                  | <b>36.7</b>    |
|  |            |                 |             |                  | <b>HIGH</b>    |

**Bank Erosion Hazard Rating Guide**

| Bank Erosion Hazard Rating Guide |                   |               |                             |              |                            |         |                   |         |                         |           |   |      |             |         |  |
|----------------------------------|-------------------|---------------|-----------------------------|--------------|----------------------------|---------|-------------------|---------|-------------------------|-----------|---|------|-------------|---------|--|
| Stream                           |                   | UT2-FS BEHI 1 |                             | Assessment # |                            | 17      |                   | Date    |                         | 8/12/2014 |   | Crew |             | BSH,BPB |  |
| Bank Erosion Potential           | Bank Height (ft): |               | Bank Height/<br>Bankfull Ht |              | Root Depth/<br>Bank Height |         | Root<br>Density % |         | Bank Angle<br>(Degrees) |           | Surface<br>Protection%                      |      |             |         |  |
|                                  | VERY LOW          | Value         | 1.0-1.1                     |              | 1.0-0.9                    |         | 100-80            |         | 0-20                    |           | 100-80                                      |      |             |         |  |
|                                  |                   | Index         | 1.0-1.9                     | 0.00         | 1.0-1.9                    | 0.00    | 1.0-1.9           | 0.00    | 1.0-1.9                 | 0.00      | 1.0-1.9                                     | 0.00 |             |         |  |
|                                  | LOW               | Value         | 1.11-1.19                   |              | 0.89-0.5                   | 0.70    | 79-55             |         | 21-60                   |           | 79-55                                       |      |             |         |  |
|                                  |                   | Index         | 2.0-3.9                     | 0.00         | 2.0-3.9                    | 2.93    | 2.0-3.9           | 0.00    | 2.0-3.9                 | 0.00      | 2.0-3.9                                     | 0.00 |             |         |  |
|                                  | MODERATE          | Value         | 1.2-1.5                     | 1.39         | 0.49-0.3                   |         | 54-30             |         | 61-80                   | 80.00     | 54-30                                       |      |             |         |  |
|                                  |                   | Index         | 4.0-5.9                     | 5.20         | 4.0-5.9                    | 0.00    | 4.0-5.9           | 0.00    | 4.0-5.9                 | 5.90      | 4.0-5.9                                     | 0.00 |             |         |  |
|                                  | HIGH              | Value         | 1.6-2.0                     |              | 0.29-0.15                  |         | 29-15             | 17.50   | 81-90                   |           | 29-15                                       |      |             |         |  |
|                                  |                   | Index         | 6.0-7.9                     | 0.00         | 6.0-7.9                    | 0.00    | 6.0-7.9           | 7.56    | 6.0-7.9                 | 0.00      | 6.0-7.9                                     | 0.00 |             |         |  |
|                                  | VERY HIGH         | Value         | 2.1-2.8                     |              | 0.14-0.05                  |         | 14-5.0            |         | 91-119                  |           | 14-10                                       |      |             |         |  |
|                                  | Index             | 8.0-9.0       | 0.00                        | 8.0-9.0      | 0.00                       | 8.0-9.0 | 0.00              | 8.0-9.0 | 0.00                    | 8.0-9.0   | 0.00  |      |             |         |  |
| EXTREME                          | Value             | >2.8          |                             | <0.05        |                            | <5      |                   | >119    |                         | <10       | 5.00  |      |             |         |  |
|                                  | Index             | 10            | 0.00                        | 10           | 0.00                       | 10      | 0.00              | 10      | 0.00                    | 10        | 10.00                                       |      |             |         |  |
| V = value, I = index             |                   |               |                             |              |                            |         |                   |         |                         |           | SUB-TOTAL (Sum one index from each column): |      | <b>31.6</b> |         |  |

| Bank Material Description:   |           |
|--|-----------|
| Bank Materials   |           |
| Bedrock (Bedrock banks have very low bank erosion potential)   |           |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |           |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |           |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |           |
| Sand (Add 10 points)   |           |
| Silt Clay (+ 0: no adjustment)   |           |
| BANK MATERIAL ADJUSTMENT:  | <b>10</b> |

| Stratification Comments:   |  |
|--|--|
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

| VERY LOW                               | LOW     | MODERATE        | HIGH    | VERY HIGH | EXTREME          |
|--|---------|-----------------|---------|-----------|------------------|
| 5-9.5                                  | 10-19.5 | 20-29.5         | 30-39.5 | 40-45     | 46-50            |
| Bank location description (circle one) |         |                 |         |           | GRAND TOTAL:     |
| Straight Reach                         |         | Outside of Bend |         |           | BEHI RATING:     |
|  |         |                 |         |           | <b>41.6</b>      |
|  |         |                 |         |           | <b>VERY HIGH</b> |

**Bank Erosion Hazard Rating Guide**

| Stream                 |                   | UT2-FS BEHI 2 (upstream reach) |           | Assessment #               | 16        | Date              | 8/12/2014 | Crew                    | BSH,BPB |                        |   |       |             |
|------------------------|-------------------|--------------------------------|-----------|----------------------------|-----------|-------------------|-----------|-------------------------|---------|------------------------|---|-------|-------------|
| Bank Erosion Potential | Bank Height (ft): | Bank Height/<br>Bankfull Ht    |           | Root Depth/<br>Bank Height |           | Root<br>Density % |           | Bank Angle<br>(Degrees) |         | Surface<br>Protection% |   |       |             |
|                        | VERY LOW          | Value                          | 1.0-1.1   |                            | 1.0-0.9   |                   | 100-80    |                         | 0-20    |                        | 100-80                                      |       |             |
|                        |                   | Index                          | 1.0-1.9   | 0.00                       | 1.0-1.9   | 0.00              | 1.0-1.9   | 0.00                    | 1.0-1.9 | 0.00                   | 1.0-1.9                                     | 0.00  |             |
|                        | LOW               | Value                          | 1.11-1.19 |                            | 0.89-0.5  | 0.81              | 79-55     |                         | 21-60   | 45.00                  | 79-55                                       | 70.00 |             |
|                        |                   | Index                          | 2.0-3.9   | 0.00                       | 2.0-3.9   | 2.39              | 2.0-3.9   | 0.00                    | 2.0-3.9 | 3.17                   | 2.0-3.9                                     | 2.71  |             |
|                        | MODERATE          | Value                          | 1.2-1.5   |                            | 0.49-0.3  |                   | 54-30     |                         | 61-80   |                        | 54-30                                       |       |             |
|                        |                   | Index                          | 4.0-5.9   | 0.00                       | 4.0-5.9   | 0.00              | 4.0-5.9   | 0.00                    | 4.0-5.9 | 0.00                   | 4.0-5.9                                     | 0.00  |             |
|                        | HIGH              | Value                          | 1.6-2.0   |                            | 0.29-0.15 |                   | 29-15     |                         | 81-90   |                        | 29-15                                       |       |             |
|                        |                   | Index                          | 6.0-7.9   | 0.00                       | 6.0-7.9   | 0.00              | 6.0-7.9   | 0.00                    | 6.0-7.9 | 0.00                   | 6.0-7.9                                     | 0.00  |             |
|                        | VERY HIGH         | Value                          | 2.1-2.8   |                            | 0.14-0.05 |                   | 14-5.0    |                         | 91-119  |                        | 14-10                                       |       |             |
|                        | Index             | 8.0-9.0                        | 0.00      | 8.0-9.0                    | 0.00      | 8.0-9.0           | 0.00      | 8.0-9.0                 | 0.00    | 8.0-9.0                | 0.00  |       |             |
| EXTREME                | Value             | >2.8                           | 2.86      | <0.05                      |           | <5                | 4.07      | >119                    |         | <10                    |   |       |             |
|                        | Index             | 10                             | 10.00     | 10                         | 0.00      | 10                | 10.00     | 10                      | 0.00    | 10                     | 0.00  |       |             |
| V = value, I = index   |                   |                                |           |                            |           |                   |           |                         |         |                        | SUB-TOTAL (Sum one index from each column): |       | <b>28.3</b> |

**Bank Material Description:**

Bank Materials

- Bedrock (Bedrock banks have very low bank erosion potential)
- Boulders (Banks composed of boulders have low bank erosion potential)
- Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust)
- Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)
- Sand (Add 10 points)
- Silt Clay (+ 0: no adjustment)

BANK MATERIAL ADJUSTMENT: **10**

**Stratification Comments:**

Stratification

Add 5-10 points depending on position of unstable layers in relation to bankfull stage

STRATIFICATION ADJUSTMENT: **0**

| VERY LOW  | LOW     | MODERATE | HIGH    | VERY HIGH | EXTREME      |             |
|---|---------|----------|---------|-----------|--------------|-------------|
| 5-9.5   | 10-19.5 | 20-29.5  | 30-39.5 | 40-45     | 46-50        |             |
| Bank location description (circle one)              |         |          |         |           | GRAND TOTAL: | <b>38.3</b> |
| Straight Reach                      Outside of Bend |         |          |         |           | BEHI RATING: | <b>HIGH</b> |

**Bank Erosion Hazard Rating Guide**

| Stream                 |                   | UT1-FS- BEHI Ag Field |                             | Assessment # |                            | 11      |                   | Date    |                         | 8/12/2014 |   | Crew  |      | BSH, BPB |  |
|------------------------|-------------------|-----------------------|-----------------------------|--------------|----------------------------|---------|-------------------|---------|-------------------------|-----------|---|-------|------|----------|--|
| Bank Erosion Potential | Bank Height (ft): |                       | Bank Height/<br>Bankfull Ht |              | Root Depth/<br>Bank Height |         | Root<br>Density % |         | Bank Angle<br>(Degrees) |           | Surface<br>Protection%                      |       |      |          |  |
|                        | VERY LOW          | Value                 | 1.0-1.1                     |              | 1.0-0.9                    |         | 100-80            |         | 0-20                    |           | 100-80                                      | 90.00 |      |          |  |
|                        |                   | Index                 | 1.0-1.9                     | 0.00         | 1.0-1.9                    | 0.00    | 1.0-1.9           | 0.00    | 1.0-1.9                 | 0.00      | 1.0-1.9                                     | 1.45  |      |          |  |
|                        | LOW               | Value                 | 1.11-1.19                   |              | 0.89-0.5                   | 0.81    | 79-55             | 61.05   | 21-60                   |           | 79-55                                       |       |      |          |  |
|                        |                   | Index                 | 2.0-3.9                     | 0.00         | 2.0-3.9                    | 2.39    | 2.0-3.9           | 3.42    | 2.0-3.9                 | 0.00      | 2.0-3.9                                     | 0.00  |      |          |  |
|                        | MODERATE          | Value                 | 1.2-1.5                     | 1.22         | 0.49-0.3                   |         | 54-30             |         | 61-80                   | 65.00     | 54-30                                       |       |      |          |  |
|                        |                   | Index                 | 4.0-5.9                     | 4.13         | 4.0-5.9                    | 0.00    | 4.0-5.9           | 0.00    | 4.0-5.9                 | 4.40      | 4.0-5.9                                     | 0.00  |      |          |  |
|                        | HIGH              | Value                 | 1.6-2.0                     |              | 0.29-0.15                  |         | 29-15             |         | 81-90                   |           | 29-15                                       |       |      |          |  |
|                        |                   | Index                 | 6.0-7.9                     | 0.00         | 6.0-7.9                    | 0.00    | 6.0-7.9           | 0.00    | 6.0-7.9                 | 0.00      | 6.0-7.9                                     | 0.00  |      |          |  |
|                        | VERY HIGH         | Value                 | 2.1-2.8                     |              | 0.14-0.05                  |         | 14-5.0            |         | 91-119                  |           | 14-10                                       |       |      |          |  |
| Index                  |                   | 8.0-9.0               | 0.00                        | 8.0-9.0      | 0.00                       | 8.0-9.0 | 0.00              | 8.0-9.0 | 0.00                    | 8.0-9.0   | 0.00  |       |      |          |  |
| EXTREME                | Value             | >2.8                  |                             | <0.05        |                            | <5      |                   | >119    |                         | <10       |   |       |      |          |  |
|                        | Index             | 10                    | 0.00                        | 10           | 0.00                       | 10      | 0.00              | 10      | 0.00                    | 10        | 0.00  |       |      |          |  |
| V = value, I = index   |                   |                       |                             |              |                            |         |                   |         |                         |           | SUB-TOTAL (Sum one index from each column): |       | 15.8 |          |  |

|  |    |
|--|----|
| <b>Bank Material Description:</b>  |    |
| Bank Materials   |    |
| Bedrock (Bedrock banks have very low bank erosion potential)   |    |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |    |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |    |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |    |
| Sand (Add 10 points)   |    |
| Silt Clay (+ 0: no adjustment)   |    |
| BANK MATERIAL ADJUSTMENT:  | 10 |

|  |  |
|--|--|
| <b>Stratification Comments:</b>  |  |
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

|  |            |                 |             |                  |                |
|--|------------|-----------------|-------------|------------------|----------------|
| <b>VERY LOW</b>                        | <b>LOW</b> | <b>MODERATE</b> | <b>HIGH</b> | <b>VERY HIGH</b> | <b>EXTREME</b> |
| 5-9.5                                  | 10-19.5    | 20-29.5         | 30-39.5     | 40-45            | 46-50          |
| Bank location description (circle one) |            |                 |             |                  | GRAND TOTAL:   |
| Straight Reach                         |            | Outside of Bend |             | BEHI RATING:     | 25.8           |
|  |            |                 |             |                  | MODERATE       |

**Bank Erosion Hazard Rating Guide**

| Stream                 |                   | UT1- FS- BEHI Residential |                             | Assessment # |                            | 10      |                   | Date    |                         | 8/12/2014 |   | Crew  |             | BSH, BPB |  |
|------------------------|-------------------|---------------------------|-----------------------------|--------------|----------------------------|---------|-------------------|---------|-------------------------|-----------|---|-------|-------------|----------|--|
| Bank Erosion Potential | Bank Height (ft): |                           | Bank Height/<br>Bankfull Ht |              | Root Depth/<br>Bank Height |         | Root<br>Density % |         | Bank Angle<br>(Degrees) |           | Surface<br>Protection%                      |       |             |          |  |
|                        | VERY LOW          | Value                     | 1.0-1.1                     |              | 1.0-0.9                    |         | 100-80            |         | 0-20                    |           | 100-80                                      |       |             |          |  |
|                        |                   | Index                     | 1.0-1.9                     | 0.00         | 1.0-1.9                    | 0.00    | 1.0-1.9           | 0.00    | 1.0-1.9                 | 0.00      | 1.0-1.9                                     | 0.00  |             |          |  |
|                        | LOW               | Value                     | 1.11-1.19                   |              | 0.89-0.5                   | 0.80    | 79-55             | 60.00   | 21-60                   | 45.00     | 79-55                                       | 60.00 |             |          |  |
|                        |                   | Index                     | 2.0-3.9                     | 0.00         | 2.0-3.9                    | 2.44    | 2.0-3.9           | 3.50    | 2.0-3.9                 | 3.17      | 2.0-3.9                                     | 3.50  |             |          |  |
|                        | MODERATE          | Value                     | 1.2-1.5                     |              | 0.49-0.3                   |         | 54-30             |         | 61-80                   |           | 54-30                                       |       |             |          |  |
|                        |                   | Index                     | 4.0-5.9                     | 0.00         | 4.0-5.9                    | 0.00    | 4.0-5.9           | 0.00    | 4.0-5.9                 | 0.00      | 4.0-5.9                                     | 0.00  |             |          |  |
|                        | HIGH              | Value                     | 1.6-2.0                     | 2.00         | 0.29-0.15                  |         | 29-15             |         | 81-90                   |           | 29-15                                       |       |             |          |  |
|                        |                   | Index                     | 6.0-7.9                     | 7.90         | 6.0-7.9                    | 0.00    | 6.0-7.9           | 0.00    | 6.0-7.9                 | 0.00      | 6.0-7.9                                     | 0.00  |             |          |  |
|                        | VERY HIGH         | Value                     | 2.1-2.8                     |              | 0.14-0.05                  |         | 14-5.0            |         | 91-119                  |           | 14-10                                       |       |             |          |  |
|                        | Index             | 8.0-9.0                   | 0.00                        | 8.0-9.0      | 0.00                       | 8.0-9.0 | 0.00              | 8.0-9.0 | 0.00                    | 8.0-9.0   | 0.00  |       |             |          |  |
| EXTREME                | Value             | >2.8                      |                             | <0.05        |                            | <5      |                   | >119    |                         | <10       |   |       |             |          |  |
|                        | Index             | 10                        | 0.00                        | 10           | 0.00                       | 10      | 0.00              | 10      | 0.00                    | 10        | 0.00  |       |             |          |  |
| V = value, I = index   |                   |                           |                             |              |                            |         |                   |         |                         |           | SUB-TOTAL (Sum one index from each column): |       | <b>20.5</b> |          |  |

|  |           |
|--|-----------|
| <b>Bank Material Description:</b>  |           |
| Bank Materials   |           |
| Bedrock (Bedrock banks have very low bank erosion potential)   |           |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |           |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |           |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |           |
| Sand (Add 10 points)   |           |
| Silt Clay (+ 0: no adjustment)   |           |
| BANK MATERIAL ADJUSTMENT:  | <b>10</b> |

|  |  |
|--|--|
| <b>Stratification Comments:</b>  |  |
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

|  |            |                 |             |                  |                |
|--|------------|-----------------|-------------|------------------|----------------|
| <b>VERY LOW</b>                        | <b>LOW</b> | <b>MODERATE</b> | <b>HIGH</b> | <b>VERY HIGH</b> | <b>EXTREME</b> |
| 5-9.5                                  | 10-19.5    | 20-29.5         | 30-39.5     | 40-45            | 46-50          |
| Bank location description (circle one) |            |                 |             |                  | GRAND TOTAL:   |
| Straight Reach                         |            | Outside of Bend |             |                  | BEHI RATING:   |
|  |            |                 |             |                  | <b>30.5</b>    |
|  |            |                 |             |                  | <b>HIGH</b>    |

| Bank Erosion Hazard Rating Guide |                       |                             |           |                            |         |                   |         |                         |         |   |       |      |
|----------------------------------|-----------------------|-----------------------------|-----------|----------------------------|---------|-------------------|---------|-------------------------|---------|---|-------|------|
| Bank Erosion Potential           | Stream                | UT4-FS (1)                  |           | Assesment #                | 22      |                   | Date    | 8/11/2014               |         | Crew  | WAM   |      |
|                                  | Bank Height (ft):     | Bank Height/<br>Bankfull Ht |           | Root Depth/<br>Bank Height |         | Root<br>Density % |         | Bank Angle<br>(Degrees) |         | Surface<br>Protection%                      |       |      |
|                                  | Bankfull Height (ft): | Value                       | Index     | Value                      | Index   | Value             | Index   | Value                   | Index   | Value                                       | Index |      |
|                                  | VERY LOW              | 1.0-1.1                     | 0.00      | 1.0-0.9                    | 0.00    | 100-80            | 0.00    | 0-20                    | 0.00    | 100-80                                      | 0.00  |      |
|                                  | LOW                   | 1.11-1.19                   | 0.00      | 0.89-0.5                   | 0.00    | 79-55             | 0.00    | 21-60                   | 0.00    | 79-55                                       | 60.00 |      |
|                                  |                       | 2.0-3.9                     | 0.00      | 2.0-3.9                    | 0.00    | 2.0-3.9           | 0.00    | 2.0-3.9                 | 0.00    | 2.0-3.9                                     | 3.50  |      |
|                                  | MODERATE              | 1.2-1.5                     | 0.00      | 0.49-0.3                   | 0.35    | 54-30             | 0.00    | 61-80                   | 75.00   | 54-30                                       | 0.00  |      |
|                                  |                       | 4.0-5.9                     | 0.00      | 4.0-5.9                    | 5.40    | 4.0-5.9           | 0.00    | 4.0-5.9                 | 5.40    | 4.0-5.9                                     | 0.00  |      |
|                                  | HIGH                  | 1.6-2.0                     | 0.00      | 0.29-0.15                  | 0.00    | 29-15             | 0.00    | 81-90                   | 0.00    | 29-15                                       | 0.00  |      |
|                                  |                       | 6.0-7.9                     | 0.00      | 6.0-7.9                    | 0.00    | 6.0-7.9           | 0.00    | 6.0-7.9                 | 0.00    | 6.0-7.9                                     | 0.00  |      |
| VERY HIGH                        | 2.1-2.8               | 0.00                        | 0.14-0.05 | 0.00                       | 14-5.0  | 7.00              | 91-119  | 0.00                    | 14-10   | 0.00  |       |      |
|                                  | 8.0-9.0               | 0.00                        | 8.0-9.0   | 0.00                       | 8.0-9.0 | 8.78              | 8.0-9.0 | 0.00                    | 8.0-9.0 | 0.00  |       |      |
| EXTREME                          | >2.8                  | 3.33                        | <0.05     | 0.00                       | <5      | 0.00              | >119    | 0.00                    | <10     | 0.00  |       |      |
|                                  | 10                    | 10.00                       | 10        | 0.00                       | 10      | 0.00              | 10      | 0.00                    | 10      | 0.00  |       |      |
| V = value, I = index             |                       |                             |           |                            |         |                   |         |                         |         | SUB-TOTAL (Sum one index from each column): |       | 33.1 |

|  |    |
|--|----|
| <b>Bank Material Description:</b>  |    |
| Bank Materials   |    |
| Bedrock (Bedrock banks have very low bank erosion potential)   |    |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |    |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |    |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |    |
| Sand (Add 10 points)   |    |
| Silt Clay (+ 0: no adjustment)   |    |
| BANK MATERIAL ADJUSTMENT:  | 10 |

|  |  |
|--|--|
| <b>Stratification Comments:</b>  |  |
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

|  |            |                 |             |                  |                |
|--|------------|-----------------|-------------|------------------|----------------|
| <b>VERY LOW</b>                        | <b>LOW</b> | <b>MODERATE</b> | <b>HIGH</b> | <b>VERY HIGH</b> | <b>EXTREME</b> |
| 5-9.5                                  | 10-19.5    | 20-29.5         | 30-39.5     | 40-45            | 46-50          |
| Bank location description (circle one) |            |                 |             |                  | GRAND TOTAL:   |
| Straight Reach                         |            | Outside of Bend |             | BEHI RATING:     | 43.1           |
|  |            |                 |             |                  | VERY HIGH      |



| Bank Erosion Hazard Rating Guide |                   |                       |                          |           |                         |         |                |         |                      |   |                     |       |
|----------------------------------|-------------------|-----------------------|--------------------------|-----------|-------------------------|---------|----------------|---------|----------------------|---|---------------------|-------|
| Bank Erosion Potential           | Stream            |                       | Assesment #              |           |                         |         | Date           |         | Crew                 |   |                     |       |
|                                  | UT3- FS (2)       |                       | 18                       |           |                         |         |                |         |                      |   |                     |       |
|                                  | Bank Height (ft): | Bankfull Height (ft): | Bank Height/ Bankfull Ht |           | Root Depth/ Bank Height |         | Root Density % |         | Bank Angle (Degrees) |   | Surface Protection% |       |
|                                  | VERY LOW          | Value                 | 1.0-1.1                  |           | 1.0-0.9                 |         | 100-80         |         | 0-20                 |   | 100-80              |       |
|                                  |                   | Index                 | 1.0-1.9                  | 0.00      | 1.0-1.9                 | 0.00    | 1.0-1.9        | 0.00    | 1.0-1.9              | 0.00  | 1.0-1.9             | 0.00  |
|                                  | LOW               | Value                 | 1.11-1.19                |           | 0.89-0.5                |         | 79-55          |         | 21-60                |   | 79-55               | 70.00 |
|                                  |                   | Index                 | 2.0-3.9                  | 0.00      | 2.0-3.9                 | 0.00    | 2.0-3.9        | 0.00    | 2.0-3.9              | 0.00  | 2.0-3.9             | 2.71  |
|                                  | MODERATE          | Value                 | 1.2-1.5                  |           | 0.49-0.3                | 0.42    | 54-30          |         | 61-80                | 65.00                                       | 54-30               |       |
|                                  |                   | Index                 | 4.0-5.9                  | 0.00      | 4.0-5.9                 | 4.70    | 4.0-5.9        | 0.00    | 4.0-5.9              | 4.40  | 4.0-5.9             | 0.00  |
|                                  | HIGH              | Value                 | 1.6-2.0                  |           | 0.29-0.15               |         | 29-15          |         | 81-90                |   | 29-15               |       |
| Index                            |                   | 6.0-7.9               | 0.00                     | 6.0-7.9   | 0.00                    | 6.0-7.9 | 0.00           | 6.0-7.9 | 0.00                 | 6.0-7.9                                     | 0.00                |       |
| VERY HIGH                        | Value             | 2.1-2.8               |                          | 0.14-0.05 |                         | 14-5.0  | 6.42           | 91-119  |                      | 14-10                                       |                     |       |
|                                  | Index             | 8.0-9.0               | 0.00                     | 8.0-9.0   | 0.00                    | 8.0-9.0 | 8.84           | 8.0-9.0 | 0.00                 | 8.0-9.0                                     | 0.00                |       |
| EXTREME                          | Value             | >2.8                  | 1.75                     | <0.05     |                         | <5      |                | >119    |                      | <10   |                     |       |
|                                  | Index             | 10                    | 10.00                    | 10        | 0.00                    | 10      | 0.00           | 10      | 0.00                 | 10  | 0.00                |       |
| V = value, I = index             |                   |                       |                          |           |                         |         |                |         |                      | SUB-TOTAL (Sum one index from each column): |                     | 30.7  |

|  |    |
|--|----|
| <b>Bank Material Description:</b>  |    |
| Bank Materials   |    |
| Bedrock (Bedrock banks have very low bank erosion potential)   |    |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |    |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |    |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |    |
| Sand (Add 10 points)   |    |
| Silt Clay (+ 0: no adjustment)   |    |
| BANK MATERIAL ADJUSTMENT:  | 10 |

|  |  |
|--|--|
| <b>Stratification Comments:</b>  |  |
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

|  |            |                 |             |                  |                |
|--|------------|-----------------|-------------|------------------|----------------|
| <b>VERY LOW</b>                        | <b>LOW</b> | <b>MODERATE</b> | <b>HIGH</b> | <b>VERY HIGH</b> | <b>EXTREME</b> |
| 5-9.5                                  | 10-19.5    | 20-29.5         | 30-39.5     | 40-45            | 46-50          |
| Bank location description (circle one) |            |                 |             | GRAND TOTAL:     | 40.7           |
| Straight Reach                         |            | Outside of Bend |             | BEHI RATING:     | VERY HIGH      |

**Bank Erosion Hazard Rating Guide**

| Stream                 |                   | UT3-F5 (3)                  |           | Assesment #                |           | 19                |         | Date                    |         | 8/11/2014              |   | Crew  |             | WAM |  |
|------------------------|-------------------|-----------------------------|-----------|----------------------------|-----------|-------------------|---------|-------------------------|---------|------------------------|---|-------|-------------|-----|--|
| Bank Erosion Potential | Bank Height (ft): | Bank Height/<br>Bankfull Ht |           | Root Depth/<br>Bank Height |           | Root<br>Density % |         | Bank Angle<br>(Degrees) |         | Surface<br>Protection% |   |       |             |     |  |
|                        | VERY LOW          | Value                       | 1.0-1.1   |                            | 1.0-0.9   | 1.00              | 100-80  |                         | 0-20    |                        | 100-80                                      | 90.00 |             |     |  |
|                        |                   | Index                       | 1.0-1.9   | 0.00                       | 1.0-1.9   | 1.00              | 1.0-1.9 | 0.00                    | 1.0-1.9 | 0.00                   | 1.0-1.9                                     | 1.45  |             |     |  |
|                        | LOW               | Value                       | 1.11-1.19 |                            | 0.89-0.5  |                   | 79-55   |                         | 21-60   | 25.00                  | 79-55                                       |       |             |     |  |
|                        |                   | Index                       | 2.0-3.9   | 0.00                       | 2.0-3.9   | 0.00              | 2.0-3.9 | 0.00                    | 2.0-3.9 | 2.19                   | 2.0-3.9                                     | 0.00  |             |     |  |
|                        | MODERATE          | Value                       | 1.2-1.5   |                            | 0.49-0.3  |                   | 54-30   | 40.00                   | 61-80   |                        | 54-30                                       |       |             |     |  |
|                        |                   | Index                       | 4.0-5.9   | 0.00                       | 4.0-5.9   | 0.00              | 4.0-5.9 | 5.11                    | 4.0-5.9 | 0.00                   | 4.0-5.9                                     | 0.00  |             |     |  |
|                        | HIGH              | Value                       | 1.6-2.0   |                            | 0.29-0.15 |                   | 29-15   |                         | 81-90   |                        | 29-15                                       |       |             |     |  |
|                        |                   | Index                       | 6.0-7.9   | 0.00                       | 6.0-7.9   | 0.00              | 6.0-7.9 | 0.00                    | 6.0-7.9 | 0.00                   | 6.0-7.9                                     | 0.00  |             |     |  |
|                        | VERY HIGH         | Value                       | 2.1-2.8   |                            | 0.14-0.05 |                   | 14-5.0  |                         | 91-119  |                        | 14-10                                       |       |             |     |  |
|                        | Index             | 8.0-9.0                     | 0.00      | 8.0-9.0                    | 0.00      | 8.0-9.0           | 0.00    | 8.0-9.0                 | 0.00    | 8.0-9.0                | 0.00  |       |             |     |  |
| EXTREME                | Value             | >2.8                        | 3.00      | <0.05                      |           | <5                |         | >119                    |         | <10                    |   |       |             |     |  |
|                        | Index             | 10                          | 10.00     | 10                         | 0.00      | 10                | 0.00    | 10                      | 0.00    | 10                     | 0.00  |       |             |     |  |
| V = value, I = index   |                   |                             |           |                            |           |                   |         |                         |         |                        | SUB-TOTAL (Sum one index from each column): |       | <b>19.8</b> |     |  |

**Bank Material Description:**

Bank Materials

- Bedrock (Bedrock banks have very low bank erosion potential)
- Boulders (Banks composed of boulders have low bank erosion potential)
- Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust)
- Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)
- Sand (Add 10 points)
- Silt Clay (+ 0: no adjustment)

BANK MATERIAL ADJUSTMENT: **10**

**Stratification Comments:**

Stratification

Add 5-10 points depending on position of unstable layers in relation to bankfull stage

STRATIFICATION ADJUSTMENT: **0**

| VERY LOW | LOW     | MODERATE | HIGH    | VERY HIGH | EXTREME |
|----------|---------|----------|---------|-----------|---------|
| 5-9.5    | 10-19.5 | 20-29.5  | 30-39.5 | 40-45     | 46-50   |

Bank location description (circle one)

Straight Reach

Outside of Bend

GRAND TOTAL: **29.8**

BEHI RATING: **HIGH**

| Bank Erosion Hazard Rating Guide |                   |                       |                          |           |                         |         |                |         |                      |   |                     |       |
|----------------------------------|-------------------|-----------------------|--------------------------|-----------|-------------------------|---------|----------------|---------|----------------------|---|---------------------|-------|
| Bank Erosion Potential           | Stream            |                       | Assesment #              |           |                         |         | Date           |         | Crew                 |   |                     |       |
|                                  | UT3-FS (4)        |                       | 20                       |           |                         |         |                |         |                      |   |                     |       |
|                                  | Bank Height (ft): | Bankfull Height (ft): | Bank Height/ Bankfull Ht |           | Root Depth/ Bank Height |         | Root Density % |         | Bank Angle (Degrees) |   | Surface Protection% |       |
|                                  | VERY LOW          | Value                 | 1.0-1.1                  |           | 1.0-0.9                 |         | 100-80         |         | 0-20                 |   | 100-80              |       |
|                                  |                   | Index                 | 1.0-1.9                  | 0.00      | 1.0-1.9                 | 0.00    | 1.0-1.9        | 0.00    | 1.0-1.9              | 0.00  | 1.0-1.9             | 0.00  |
|                                  | LOW               | Value                 | 1.11-1.19                |           | 0.89-0.5                |         | 79-55          |         | 21-60                | 60.00                                       | 79-55               | 60.00 |
|                                  |                   | Index                 | 2.0-3.9                  | 0.00      | 2.0-3.9                 | 0.00    | 2.0-3.9        | 0.00    | 2.0-3.9              | 3.90  | 2.0-3.9             | 3.50  |
|                                  | MODERATE          | Value                 | 1.2-1.5                  |           | 0.49-0.3                | 0.30    | 54-30          |         | 61-80                |   | 54-30               |       |
|                                  |                   | Index                 | 4.0-5.9                  | 0.00      | 4.0-5.9                 | 5.90    | 4.0-5.9        | 0.00    | 4.0-5.9              | 0.00  | 4.0-5.9             | 0.00  |
|                                  | HIGH              | Value                 | 1.6-2.0                  |           | 0.29-0.15               |         | 29-15          |         | 81-90                |   | 29-15               |       |
|                                  | Index             | 6.0-7.9               | 0.00                     | 6.0-7.9   | 0.00                    | 6.0-7.9 | 0.00           | 6.0-7.9 | 0.00                 | 6.0-7.9                                     | 0.00                |       |
| VERY HIGH                        | Value             | 2.1-2.8               |                          | 0.14-0.05 |                         | 14-5.0  | 9.00           | 91-119  |                      | 14-10                                       |                     |       |
|                                  | Index             | 8.0-9.0               | 0.00                     | 8.0-9.0   | 0.00                    | 8.0-9.0 | 8.56           | 8.0-9.0 | 0.00                 | 8.0-9.0                                     | 0.00                |       |
| EXTREME                          | Value             | >2.8                  | 3.33                     | <0.05     |                         | <5      |                | >119    |                      | <10   |                     |       |
|                                  | Index             | 10                    | 10.00                    | 10        | 0.00                    | 10      | 0.00           | 10      | 0.00                 | 10  | 0.00                |       |
| V = value, I = index             |                   |                       |                          |           |                         |         |                |         |                      | SUB-TOTAL (Sum one index from each column): |                     | 31.9  |

| Bank Material Description:   |    |
|--|----|
| Bank Materials   |    |
| Bedrock (Bedrock banks have very low bank erosion potential)   |    |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |    |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |    |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |    |
| Sand (Add 10 points)   |    |
| Silt Clay (+ 0: no adjustment)   |    |
| BANK MATERIAL ADJUSTMENT:  | 10 |

| Stratification Comments:   |  |
|--|--|
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

| VERY LOW                               | LOW     | MODERATE        | HIGH    | VERY HIGH    | EXTREME      |      |
|--|---------|-----------------|---------|--------------|--------------|------|
| 5-9.5                                  | 10-19.5 | 20-29.5         | 30-39.5 | 40-45        | 46-50        |      |
| Bank location description (circle one) |         |                 |         |              | GRAND TOTAL: | 41.9 |
| Straight Reach                         |         | Outside of Bend |         | BEHI RATING: | VERY HIGH    |      |

**Bank Erosion Hazard Rating Guide**

| Stream                 |                   | UT3-F5 (5)                  |           | Assesment #                |           | 21                |         | Date                    |         | 8/12/2014              |   | Crew  |      | WAM |  |  |
|------------------------|-------------------|-----------------------------|-----------|----------------------------|-----------|-------------------|---------|-------------------------|---------|------------------------|---|-------|------|-----|--|--|
| Bank Erosion Potential | Bank Height (ft): | Bank Height/<br>Bankfull Ht |           | Root Depth/<br>Bank Height |           | Root<br>Density % |         | Bank Angle<br>(Degrees) |         | Surface<br>Protection% |   |       |      |     |  |  |
|                        | VERY LOW          | Value                       | 1.0-1.1   |                            | 1.0-0.9   |                   | 100-80  |                         | 0-20    |                        | 100-80                                      | 90.00 |      |     |  |  |
|                        |                   | Index                       | 1.0-1.9   | 0.00                       | 1.0-1.9   | 0.00              | 1.0-1.9 | 0.00                    | 1.0-1.9 | 0.00                   | 1.0-1.9                                     | 1.45  |      |     |  |  |
|                        | LOW               | Value                       | 1.11-1.19 |                            | 0.89-0.5  | 0.60              | 79-55   |                         | 21-60   |                        | 79-55                                       |       |      |     |  |  |
|                        |                   | Index                       | 2.0-3.9   | 0.00                       | 2.0-3.9   | 3.41              | 2.0-3.9 | 0.00                    | 2.0-3.9 | 0.00                   | 2.0-3.9                                     | 0.00  |      |     |  |  |
|                        | MODERATE          | Value                       | 1.2-1.5   |                            | 0.49-0.3  |                   | 54-30   |                         | 61-80   | 80.00                  | 54-30                                       |       |      |     |  |  |
|                        |                   | Index                       | 4.0-5.9   | 0.00                       | 4.0-5.9   | 0.00              | 4.0-5.9 | 0.00                    | 4.0-5.9 | 5.90                   | 4.0-5.9                                     | 0.00  |      |     |  |  |
|                        | HIGH              | Value                       | 1.6-2.0   |                            | 0.29-0.15 |                   | 29-15   |                         | 81-90   |                        | 29-15                                       |       |      |     |  |  |
|                        |                   | Index                       | 6.0-7.9   | 0.00                       | 6.0-7.9   | 0.00              | 6.0-7.9 | 0.00                    | 6.0-7.9 | 0.00                   | 6.0-7.9                                     | 0.00  |      |     |  |  |
|                        | VERY HIGH         | Value                       | 2.1-2.8   | 2.50                       | 0.14-0.05 |                   | 14-5.0  |                         | 91-119  |                        | 14-10                                       |       |      |     |  |  |
|                        | Index             | 8.0-9.0                     | 8.57      | 8.0-9.0                    | 0.00      | 8.0-9.0           | 0.00    | 8.0-9.0                 | 0.00    | 8.0-9.0                | 0.00  |       |      |     |  |  |
| EXTREME                | Value             | >2.8                        |           | <0.05                      |           | <5                | 4.80    | >119                    |         | <10                    |   |       |      |     |  |  |
|                        | Index             | 10                          | 0.00      | 10                         | 0.00      | 10                | 10.00   | 10                      | 0.00    | 10                     | 0.00  |       |      |     |  |  |
| V = value, I = index   |                   |                             |           |                            |           |                   |         |                         |         |                        | SUB-TOTAL (Sum one index from each column): |       | 29.3 |     |  |  |

|  |    |
|--|----|
| <b>Bank Material Description:</b>  |    |
| Bank Materials   |    |
| Bedrock (Bedrock banks have very low bank erosion potential)   |    |
| Boulders (Banks composed of boulders have low bank erosion potential)                                    |    |
| Cobble (Subtract 10 points. If sand/gravel matrix greater than 50% of bank material, then do not adjust) |    |
| Gravel (Add 5-10 points depending percentage of bank material that is composed of sand)                  |    |
| Sand (Add 10 points)   |    |
| Silt Clay (+ 0: no adjustment)   |    |
| BANK MATERIAL ADJUSTMENT:  | 10 |

|  |  |
|--|--|
| <b>Stratification Comments:</b>  |  |
| Stratification   |  |
| Add 5-10 points depending on position of unstable layers in relation to bankfull stage |  |
| STRATIFICATION ADJUSTMENT:   |  |

|  |            |                 |             |                  |                |
|--|------------|-----------------|-------------|------------------|----------------|
| <b>VERY LOW</b>                        | <b>LOW</b> | <b>MODERATE</b> | <b>HIGH</b> | <b>VERY HIGH</b> | <b>EXTREME</b> |
| 5-9.5                                  | 10-19.5    | 20-29.5         | 30-39.5     | 40-45            | 46-50          |
| Bank location description (circle one) |            |                 |             | GRAND TOTAL:     | 39.3           |
| Straight Reach                         |            | Outside of Bend |             | BEHI RATING:     | HIGH           |

## Channel Stability Assessment Scores

|                                  | Fork Swamp BEHI 1 (above park) | Fork Swamp BEHI 2 | Fork Swamp BEHI 3 | Fork Swamp BEHI 4 | UT2-FS BEHI 1 | UT2-FS BEHI 2 (upstream reach) | UT1-FS BEHI (Ag Field) | UT1-FS BEHI (Residential) |
|----------------------------------|--------------------------------|-------------------|-------------------|-------------------|---------------|--------------------------------|------------------------|---------------------------|
| Watershed characteristics        | 9                              | 9                 | 9                 | 9                 | 7             | 10                             | 10                     | 10                        |
| Flow habit                       | 8                              | 6                 | 6                 | 6                 | 4             | 6                              | 6                      | 6                         |
| Channel pattern                  | 11                             | 7                 | 7                 | 8                 | 5             | 5                              | 9                      | 6                         |
| Entrenchment/channel confinement | 10                             | 7                 | 8                 | 7                 | 5             | 8                              | 10                     | 6                         |
| Bed material                     | 9                              | 9                 | 9                 | 9                 | 9             | 5                              | 9                      | 8                         |
| Bar development                  | 10                             | 8                 | 9                 | 7                 | 7             | 5                              | 11                     | 4                         |
| Obstructions/debris jams         | 5                              | 4                 | 4                 | 4                 | 6             | 3                              | 5                      | 5                         |
| Bank soil texture and coherence  | 10                             | 9                 | 8                 | 8                 | 6             | 6                              | 6                      | 5                         |
| Average bankangle                | 11                             | 10                | 11                | 10                | 10            | 6                              | 10                     | 7                         |
| Bank vegetation/protection       | 10                             | 9                 | 9                 | 9                 | 3             | 12                             | 12                     | 11                        |
| Bank cutting                     | 9                              | 5                 | 7                 | 4                 | 4             | 4                              | 6                      | 6                         |
| Mass wasting/bank failure        | 8                              | 5                 | 5                 | 5                 | 3             | 4                              | 6                      | 4                         |
| Upstream distance to bridge      |                                |                   |                   |                   |               |                                |                        |                           |
| Score                            | 110                            | 88                | 92                | 86                | 69            | 74                             | 100                    | 78                        |
| Rating*                          | Poor                           | Fair              | Fair              | Fair              | Fair          | Fair                           | Poor                   | Fair                      |

Excellent (0 < Score <= 33), Good (33 < Score <= 66), Fair (66 < Score <= 99), Fair (99 < Score <= 132)



**CHANNEL STABILITY ASSESSMENT FORM**

| Stability Indicator  | Excellent (1 - 3)  | Good (4 - 6)  | Fair (7 - 9)  | Poor (10 - 12)   | Score |
|--|--|---|---|--|-------|
| 1. Watershed and flood plain activity and characteristics  | Stable, forested, undisturbed watershed  | Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities   | Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed  | Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed  |       |
| 2. Flow habit  | Perennial stream with no flashy behavior   | Perennial stream or ephemeral first-order stream with slightly increased rate of flooding   | Perennial or intermittent stream with flashy behavior   | Extremely flashy; flash floods prevalent mode of discharge; ephemeral stream other than first-order stream   |       |
| 3. Channel pattern   | Straight to meandering with low radius of curvature; primarily suspended load  | Meandering, moderate radius of curvature; mix of suspended and bed loads; well-maintained engineered channel  | Meandering with some braiding; tortuous meandering; primarily bed load; poorly maintained engineered channel  | Braided; primarily bed load; engineered channel that is maintained   |       |
| 3. Channel pattern (revised)   | No evidence of channelization. Meandering, stable channel or straight (step-pool system, narrow valley), stable channel.   | Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.   | Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.   | Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.  |       |
| 4. Entrenchment/ channel confinement   | Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees   | Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river   | Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river  | Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge   |       |
| 5. Bed materia<br>Fs = approximate portion of sand in the bed  | Assorted sized tightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%  | Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%   | Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%  | Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%  |       |
| 6. Bar development   | For S < 0.02 and w/y > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and w/y are < 12, no bars are evident  | For S < 0.02 and w/y > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and w/y < 12, no bars are evident   | For S < 0.02 and w/y > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and w/y < 12   | Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and w/y > 12  |       |
| 7. Obstructions, including bedrock outcrops, armor layer, LWD jams, grade control, bridge bed paving, revetments, dikes or vanes, riprap | Rare or not present  | Occasional, causing cross currents and minor bank and bottom erosion  | Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions   | Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen  |       |
| 8. Bank soil texture and coherence   | Clay and silty clay; cohesive material   | Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials   | Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures  | Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels   |       |
| 9. Average bank slope angle (where 90° is a vertical bank)   | Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides  | Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks  | Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks   | Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks   |       |
| 10. Vegetative or engineered bank protection   | Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored | Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks | Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in place on one bank | Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks |       |
| 11. Bank cutting   | Little or none evident. Infrequent raw banks, insignificant percentage of total bank   | Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction  | Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs  | Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs   |       |
| 12. Mass wasting or bank failure   | No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach  | Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks   | Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident  | Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped  |       |
| 13. Upstream distance to bridge from meander impact point and alignment  | More than 35 m; bridge is well-aligned with river flow   | 20-35 m; bridge is aligned with flow  | 10-20 m; bridge is skewed to flow, or flow alignment is otherwise not centered beneath bridge   | Less than 10 m; bridge is poorly aligned with flow   |       |

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, w/y = width-to-depth ratio

**Total Score**

---

## **Appendix L:**

### **Prioritization Matrices**

#### List of Contents:

1. Fork Swamp Project Prioritization Matrix
  2. Category Summary for Prioritization Matrix
  3. Cost Effectiveness Ratio Summary
-



## Project Prioritization Matrix

| CATEGORY  | Public Health and Safety |    | Severity of Street Flooding (Public ROW) |    | Cost Effectiveness |    | Effect of Improvements |    | Water Quality - BMP |    | Water Quality - Erosion Control |    | Implementation Constraints |    | Grant Funding |    | Constructibility |    | TOTAL WEIGHTED SCORE |
|---|--------------------------|----|--|----|--------------------|----|------------------------|----|---------------------|----|---------------------------------|----|----------------------------|----|---------------|----|------------------|----|----------------------|
|   |                          |    |  |    |                    |    |                        |    |                     |    |                                 |    |                            |    |               |    |                  |    |                      |
| <b>Primary System Projects</b>                  |                          |    |  |    |                    |    |                        |    |                     |    |                                 |    |                            |    |               |    |                  |    |                      |
| Railroad Crossing (Fork Swamp)                  | 5                        | 50 | 5  | 50 | 3                  | 30 | 5                      | 30 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 1             | 6  | 3                | 9  | 181                  |
| Evans Street (Fork Swamp)                       | 5                        | 50 | 3  | 30 | 1                  | 10 | 5                      | 30 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 135                  |
| East Fire Tower Road (Fork Swamp)               | 5                        | 50 | 1  | 10 | 1                  | 10 | 5                      | 30 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 1             | 6  | 3                | 9  | 121                  |
| Fork Swamp Main Branch Floodplain Benching      | 3                        | 30 | 0  | 0  | 0                  | 0  | 5                      | 30 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 1             | 6  | 1                | 3  | 75                   |
| Trafalgar Drive - South (FSUT1)                 | 3                        | 30 | 3  | 30 | 5                  | 50 | 1                      | 6  | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 131                  |
| Trafalgar Drive - North (FSUT1)                 | 3                        | 30 | 3  | 30 | 3                  | 30 | 1                      | 6  | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 111                  |
| Corey Road (FSUT1)                              | 3                        | 30 | 3  | 30 | 0                  | 0  | 3                      | 18 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 93                   |
| County Home Road (FSUT3)                        | 3                        | 30 | 3  | 30 | 5                  | 50 | 1                      | 6  | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 131                  |
| East Fire Tower Road - Upstream (FSUT3)         | 1                        | 10 | 1  | 10 | 1                  | 10 | 1                      | 6  | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 51                   |
| Wimbledon Drive (FSUT3)                         | 1                        | 10 | 3  | 30 | 1                  | 10 | 3                      | 18 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 83                   |
| Tower Place (FSUT3)                             | 3                        | 30 | 3  | 30 | 3                  | 30 | 3                      | 18 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 123                  |
| Summerhaven Drive (FSUT3)                       | 3                        | 30 | 3  | 30 | 3                  | 30 | 3                      | 18 | 0                   | 0  | 0                               | 0  | 3                          | 18 | 0             | 0  | 3                | 9  | 135                  |
| East Fire Tower Road - Downstream (FSUT3)       | 3                        | 30 | 1  | 10 | 0                  | 0  | 3                      | 18 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 73                   |
| Corey Road Regional Detention (FSUT1)           | 1                        | 10 | 1  | 10 | 0                  | 0  | 5                      | 30 | 3                   | 18 | 0                               | 0  | 0                          | 0  | 3             | 18 | 0                | 0  | 86                   |
| <b>Secondary System Projects</b>                |                          |    |  |    |                    |    |                        |    |                     |    |                                 |    |                            |    |               |    |                  |    |                      |
| Corey Road Closed System (FSUT3)                | 1                        | 10 | 1  | 10 | 1                  | 10 | 1                      | 6  | 0                   | 0  | 0                               | 0  | 5                          | 30 | 0             | 0  | 3                | 9  | 75                   |
| Lynndale Closed System Phase I (FSUT3)          | 3                        | 30 | 5  | 50 | 1                  | 10 | 5                      | 30 | 0                   | 0  | 0                               | 0  | 3                          | 18 | 0             | 0  | 3                | 9  | 147                  |
| Lynndale Closed System Phase II (FSUT3)         | 3                        | 30 | 5  | 50 | 1                  | 10 | 5                      | 30 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 135                  |
| Lynndale Closed System Phase III (FSUT3)        | 3                        | 30 | 5  | 50 | 1                  | 10 | 5                      | 30 | 0                   | 0  | 0                               | 0  | 1                          | 6  | 0             | 0  | 3                | 9  | 135                  |
| <b>Stream Stabilization Projects</b>            |                          |    |  |    |                    |    |                        |    |                     |    |                                 |    |                            |    |               |    |                  |    |                      |
| Live Oak Lane                                   | 0                        | 0  | 0  | 0  | 5                  | 50 | 3                      | 18 | 0                   | 0  | 5                               | 30 | 1                          | 6  | 3             | 18 | 3                | 9  | 131                  |
| Corey Road                                      | 0                        | 0  | 0  | 0  | 5                  | 50 | 3                      | 18 | 0                   | 0  | 5                               | 30 | 3                          | 18 | 3             | 18 | 3                | 9  | 143                  |
| East Fire Tower Road                            | 0                        | 0  | 0  | 0  | 5                  | 50 | 1                      | 6  | 0                   | 0  | 5                               | 30 | 1                          | 6  | 3             | 18 | 3                | 9  | 119                  |
| Tower Place                                     | 0                        | 0  | 0  | 0  | 5                  | 50 | 3                      | 18 | 0                   | 0  | 5                               | 30 | 1                          | 6  | 3             | 18 | 3                | 9  | 131                  |
| Charles Boulevard                               | 0                        | 0  | 0  | 0  | 5                  | 50 | 1                      | 6  | 0                   | 0  | 5                               | 30 | 3                          | 18 | 3             | 18 | 3                | 9  | 131                  |
| Queen Annes Road                                | 0                        | 0  | 0  | 0  | 3                  | 30 | 1                      | 6  | 0                   | 0  | 5                               | 30 | 3                          | 18 | 3             | 18 | 3                | 9  | 111                  |
| Evans Street                                    | 1                        | 10 | 0  | 0  | 5                  | 50 | 1                      | 6  | 0                   | 0  | 5                               | 30 | 3                          | 18 | 3             | 18 | 3                | 9  | 141                  |
| <b>Water Quality Projects</b>                   |                          |    |  |    |                    |    |                        |    |                     |    |                                 |    |                            |    |               |    |                  |    |                      |
| Cromwell Drive Bioretention                     | 0                        | 0  | 0  | 0  | 1                  | 10 | 0                      | 0  | 5                   | 30 | 0                               | 0  | 1                          | 6  | 3             | 18 | 3                | 9  | 73                   |
| H. Boyd Lee Park Bioretention                   | 0                        | 0  | 0  | 0  | 3                  | 30 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 5                          | 30 | 3             | 18 | 5                | 15 | 111                  |
| H. Boyd Lee Park Permeable Pavement             | 0                        | 0  | 0  | 0  | 1                  | 10 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 5                          | 30 | 3             | 18 | 5                | 15 | 91                   |
| Faith Assembly Church Pond Retrofit             | 0                        | 0  | 0  | 0  | 1                  | 10 | 0                      | 0  | 5                   | 30 | 0                               | 0  | 1                          | 6  | 1             | 6  | 3                | 9  | 61                   |
| County Home Road RSC                            | 0                        | 0  | 0  | 0  | 1                  | 10 | 0                      | 0  | 3                   | 18 | 1                               | 6  | 3                          | 18 | 3             | 18 | 3                | 9  | 79                   |
| Irish Creek RSC                                 | 0                        | 0  | 0  | 0  | 1                  | 10 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 1                          | 6  | 3             | 18 | 1                | 3  | 55                   |
| The Oaks RSC                                    | 0                        | 0  | 0  | 0  | 3                  | 30 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 3                          | 18 | 3             | 18 | 1                | 3  | 87                   |
| South Hall Bioretention                         | 0                        | 0  | 0  | 0  | 5                  | 50 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 1                          | 6  | 3             | 18 | 3                | 9  | 101                  |
| Paramore Park Wetland                           | 0                        | 0  | 0  | 0  | 3                  | 30 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 3                          | 18 | 3             | 18 | 3                | 9  | 93                   |
| WGP Properties RSC                              | 0                        | 0  | 0  | 0  | 5                  | 50 | 0                      | 0  | 3                   | 18 | 1                               | 6  | 3                          | 18 | 3             | 18 | 3                | 9  | 119                  |
| Wintergreen Elementary Bioretention             | 0                        | 0  | 0  | 0  | 3                  | 30 | 0                      | 0  | 5                   | 30 | 0                               | 0  | 3                          | 18 | 3             | 18 | 3                | 9  | 105                  |
| Wintergreen Elementary RSC                      | 0                        | 0  | 0  | 0  | 3                  | 30 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 1                          | 6  | 3             | 18 | 1                | 3  | 75                   |
| Wintergreen Elementary Rainwater Harvesting     | 0                        | 0  | 0  | 0  | 5                  | 50 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 3                          | 18 | 3             | 18 | 1                | 3  | 107                  |
| Belle Meade Apartments Wetland                  | 0                        | 0  | 0  | 0  | 1                  | 10 | 0                      | 0  | 5                   | 30 | 0                               | 0  | 1                          | 6  | 3             | 18 | 3                | 9  | 73                   |
| Greenville Convention Center Permeable Pavement | 0                        | 0  | 0  | 0  | 0                  | 0  | 0                      | 0  | 3                   | 18 | 0                               | 0  | 1                          | 6  | 3             | 18 | 1                | 3  | 45                   |
| Lynndale Court Bioretention                     | 0                        | 0  | 0  | 0  | 5                  | 50 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 1                          | 6  | 3             | 18 | 1                | 3  | 95                   |
| Westhaven South Wetland                         | 0                        | 0  | 0  | 0  | 1                  | 10 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 1                          | 6  | 3             | 18 | 3                | 9  | 61                   |
| Shamrock RSC                                    | 0                        | 0  | 0  | 0  | 3                  | 30 | 0                      | 0  | 3                   | 18 | 0                               | 0  | 3                          | 18 | 3             | 18 | 3                | 9  | 93                   |

\*Raw numbers are shown in left side of column and weighted numbers are provided in right side of column. Totals are based on weighted numbers.

| Category   | General Description   | Score                                    | Evaluation Criteria  |  |  |
|--|---|--|--|--|--|
| Public Health and Safety                                       | Evaluates potential impact of flooding on public health and safety. Generally, refers to flooding in and around habitable structures.   | 5  | Flood water depth and/or velocity completely surrounds and threatens the structural integrity of habitable structures or vehicles.   |  |  |
|  |   |  | Finished Floor Flooding Occurs during the design storm.  |  |  |
|  |   | 3  | Erosion of stream running parallel to road threatening roadway stability or safety for Secondary   |  |  |
|  |   |  | Flood water surrounds structure but does not cause imminent danger.<br>Crawl space and HVAC units are flooded.   |  |  |
|  |   | 1  | Yard flooding occurs and flood waters are near HVAC, crawl spaces or foundations.<br>Model indicates flooding at nodes on private property or on roads/private property within a residential neighborhood. |  |  |
|  |   |  | 0  | Minor yard flooding may occur but habitable structure is not directly affected.<br>Model indicates no flooding at nodes on private property. |  |
|  |   | Severity of Street Flooding (City Owned) | Evaluates impact of flood depths to or through an area   | 5  | Street spread requirements are not met and are so severe that the street becomes impassable during the design storm or street flooding has spread into private property. |
|  |   |  |  |  | Flooding is noted on NCDOT roads as a result spread issues on adjacent city owned street.  |
| Roadway overtopping exceeding 6" in depth for Primary Systems. |   |  |  |  |  |
| 3  | Street spread requirements are not met and the streets are passable only through the center of the street.<br>Flooding noted on collector and local streets.<br>Roadway overtopping 0-6" in depth for Primary Systems |  |  |  |  |
|  | 1   |  |  | Spread requirements exceeded but street flooding is considered minor nuisance for traffic.   |  |
| 0  | Spread requirements are met.  |  |  |  |  |
| Cost Effectiveness   | Evaluates the benefit/cost of the proposed improvements   | 5  | Project benefit ratio is greater than 1.5<br>Stream Stabilization cost <\$400 per linear foot  |  |  |
|  |   |  | 3  | Project benefit ratio is between 0.5 and 1.5<br>Stream Stabilization cost <\$600 per linear foot   |  |
|  |   | 1  | Project benefit ratio is between 0.075 and 0.5<br>Stream Stabilization cost <\$1,000 per linear foot   |  |  |
|  |   |  | 0  | Project ratio is less than 0.075<br>Stream Stabilization cost >\$1,000 per linear foot   |  |

| Category               | General Description  | Score   | Evaluation Criteria  |
|------------------------|--|---|--|
| Effect of Improvements | Evaluates the number of drainage issues resolved and the number of citizens positively affected      | 5   | Multiple major drainage issues are being resolved through the proposed improvements such as street spread and increased drainage capacity. |
|                        |  |   | Proposed improvements would resolve major drainage issues for more than 5 properties.  |
|                        |  | 3   | Single drainage issue is being resolved and it is considered major.  |
|                        |  |   | Proposed improvements would resolve drainage issues for 3-5 properties.  |
| 1                      |  | Single drainage issue is being resolved and it is considered major.   |  |
|                        | Proposed improvements would resolve drainage issues for 2-3 properties.                              |   |  |
| 0                      |  | Single drainage issue is being resolved and it is considered minor.   |  |
|                        | Proposed improvements would resolve drainage issue(s) for a single property at most.                 |   |  |
| Water Quality/Quantity | Evaluates the impact a BMP would have on water quality, water quantity and NPDES Phase II Compliance | 5   | Provides both water quantity and water quality benefits.   |
|                        |  |   | Does not use manufactured or proprietary BMP technology.   |
|                        |  |   | Incorporates some form of green solution such as infiltration, LID, sustainability etc.  |
|                        |  |   | Is considered a BMP retrofit.  |
| 3                      |  | Provides water quality benefits but does not provide water quantity benefit.                                  |  |
|                        | Is considered a BMP retrofit   |   |  |
| 1                      |  | Improvements will have minimal impacts on water quality and would primarily serve as a demonstration project. |  |
|                        | Is considered a BMP retrofit.  |   |  |
| 0                      |  | Improvements will have no measurable impact on water quality and would serve only as a demonstration project. |  |

| Category                       | General Description   | Score | Evaluation Criteria   |
|--------------------------------|---|-------|---|
| Open Channel - Erosion Control | Evaluates the severity of erosion control issues and impact on water quality  | 5     | Severe erosion problems are evident and are contributing significantly to water quality issues.   |
|                                |   | 3     | Moderate erosion problems are evident and are contributing to water quality issues.   |
|                                |   |       | >2,000 Linear feet of floodplain benching with documented erosion.  |
|                                |   | 1     | Minor erosion control issues are evident and are contributing to water quality issues.  |
|                                |   | 0     | Minor erosion control issues are evident and are not contributing to water quality issues in a significant way.   |
| Implementation Constraints     | Considers potential constraints that may either delay or make the project too difficult to construct. Some examples would include significant permitting issues, high mitigation costs, numerous easement needs, required partnering with other communities, the NCDOT, or railroads. | 5     | Only minor local or state permits required. Does not involve ACOE, DWQ or FEMA.   |
|                                |   | 5     | Proposed improvements can be completed without permanent or temporary easements.  |
|                                |   |       | Project can proceed independent of other stormwater improvements identified in the master plan.   |
|                                |   | 3     | Requires State and Federal permits that are typically easy to obtain such as Nationwide permits, FEMA No Rise etc.  |
|                                |   |       | Primarily requires temporary easements with only a few permanent easements needed to build the project.   |
|                                |   | 3     | Improvements may have limited coordination with other projects such as DOT widening, GUC utility improvements or down stream drainage improvements. Significant delays in the schedule due to this coordination is not anticipated. |
|                                |   |       | Project can proceed independent of other stormwater improvements identified in the master plan.   |
|                                |   | 1     | Project is self mitigating or requires very minor mitigation.   |
|                                |   | 1     | Numerous permits required including federal, state and local agencies. Examples would include an individual permit or FEMA CLOMR/LOMR.  |
|                                |   | 1     | Extensive permanent and temporary easements are required.   |
|                                | Project can not proceed independent of other stormwater improvements identified in the master plan.   |       |   |
| 1                              | Requires floodplain benching.   |       |   |

| Category         | General Description   | Score | Evaluation Criteria  |
|------------------|---|-------|--|
| Grant Funding    | Evaluates the availability and potential to receive grant funding   | 5     | Project qualifies for multiple grants.   |
|                  |   |       | Grant does not require significant match (20% match or less)   |
|                  |   |       | City does not have an open grant from the agency providing the funding.  |
|                  |   |       | Project meets all ranking criteria and will score highly in most if not all categories.  |
|                  |   | 3     | Project qualifies for only one type of grant funding.  |
|                  |   |       | Grant requires match between 20% and 50% range. City has an open grant from agency providing the funding.  |
|                  |   |       | Project meets most if not all of the ranking criteria and will score high in key categories.   |
|                  |   | 1     | Project qualifies for only one type of grant funding.  |
|                  |   |       | Grant requires match equal to or greater than 50%. City has an open grant from agency providing the funding.   |
|                  |   |       | Project meets some of the ranking criteria and may score high in one or two categories.  |
| 0                | Project does not qualify for any type of grant funding  |       |  |
| Constructability | Evaluates relative constructability of the project including site constraints, traffic and neighborhood impacts, and impacts on adjacent property owners. | 5     | Limited to no site constraints.  |
|                  |   |       | Limited to no utility conflicts.   |
|                  |   |       | Limited to no impacts on adjacent property owners. Limited to no impacts on traffic or surround neighborhoods.   |
|                  |   | 3     | Some site constraints exist but are considered fairly minor.   |
|                  |   |       | Some utility conflicts exist but are routine and do not require major utility relocation.  |
|                  |   |       | Some traffic and neighborhood impacts occur but are fairly minor. Examples include temporary lane closures, occasional hauling or traffic detours though adjacent neighborhoods. |
|                  |   | 1     | Site constraints exist and are fairly major.   |
|                  |   |       | Utility conflicts exist and require rerouting or relocation of existing utilities.   |
|                  |   |       | Traffic and neighborhood impacts occur and are fairly major. Examples included extended road closures or hauling operations.   |

To calculate the project benefit ratio used in evaluating the cost effectiveness, the following steps were taken for each project location:

1. The weighted scores for the Public Health and Safety, Severity of Street Flooding, and Effect of Improvements categories were added together.
2. The sum of the three categories was divided by the total project cost.
3. The quotient was multiplied by a common multiplier, 5,000, to determine the benefit ratio.
4. The value was then assigned a score based on the evaluation criteria shown below for the cost effectiveness criteria.

| <b>Score</b> | <b>Evaluation Criteria</b>                     |
|--------------|--|
| 5            | Project benefit ratio is greater than 1.5      |
| 3            | Project benefit ratio is between 0.5 and 1.5   |
| 1            | Project benefit ratio is between 0.075 and 0.5 |
| 0            | Project ratio is less than 0.075               |

5. The applicable weighting factor is then applied to the score. The final number obtained is listed in the project prioritization matrix.

| <b>Weight Factor</b> | <b>Criteria</b>                          |
|----------------------|--|
| 10                   | Public Health and Safety                 |
|                      | Severity of Street Flooding (Town Owned) |
|                      | Cost Effectiveness                       |
| 6                    | Effect of Improvements                   |
|                      | Water Quality - BMP and Erosion Control  |
|                      | Implementation Constraints               |
|                      | Grant Funding                            |
| 3                    | Construction Impacts                     |
|                      | Constructability                         |

The above table presents the weighting factors that will be applied to the prioritization criteria, with the reason being that some criteria are viewed as more important (i.e. deserve a higher weighting) than others. So each score of each prioritization criteria will be multiplied by the assigned weight factor for that prioritization criteria category as shown in the Priority Matrix.