WATERSHED ASSESSMENT MONITORING PLAN

FOR

SCWSA PLANT #1 – SERVICE AREA EXPANSION

PREPARED FOR

SPALDING COUNTY WATER &
SEWERAGE FACILITIES AUTHORITY

SPALDING COUNTY, GEORGIA

Prepared by:

118 North Expressway
Griffin, Georgia 30223
770-412-7700

APPENDIX

1 INTRODUCTION

1.1 Background

The Spalding County Water & Sewerage Facilities Authority (SCWA) acquired the Wastewater Treatment Facility (WWTF) from Springs Global, Inc. in December 2009. Since taking possession of the treatment facility, SCWA has renamed the plant from Spring Mills Wastewater Treatment Facility to SCWA Plant #1 (Plant #1). Effluent from Plant #1 is discharged into Cabin Creek in the Ocmulgee River Basin.

Springs Global, Inc. owned and operated Plant #1 under a National Pollutant Discharge Elimination System (NPDES) Industrial Permit GA 003409. Under this permit the plant was rated for a capacity of 1.0 million gallons per day (MGD). SCWA took over the plant to provide wastewater treatment for residential and commercial areas. As a requirement for SCWA to operate the treatment facility, EPD requires the existing industrial permit to be changed to a municipal permit. EPD requires a Watershed Assessment (WA) to be executed for the service area watershed. Until the WA is completed a temporary NPDES Permit was issued by EPD.

The WA will obtain and document current water quality and identify stressors which affect the quality of water resources within the watershed. A Watershed Monitoring Plan (WMP) must be developed prior to the preparation of the WA. A WMP outlines the watershed area and identifies the number and locations of sampling sites along creeks and streams located within the watershed. The WMP must include the current plant service area and anticipated growth which could impact the water resources through point and non-point sources of pollution.

The Environmental Protection Division (EPD) National Pollutant Discharge Elimination System (NPDES) permits are issued for construction and operation of new or expanded wastewater treatment facilities. Specific monitoring and sampling programs are required to be implemented prior to EPD's authorization to operate the treatment facility.

The type and amount of pollutants which are carried in runoff are influenced by several factors including traffic density, littering, fertilizer and pesticide use, construction site practices, animal wastes, soil characteristics, topography, atmospheric deposition, and amount of precipitation. Potential urban pollutants include nutrients, bacteria, sediment, toxic chemicals and litter.

1.2 Purpose

The primary purpose of the Watershed Monitoring Plan (WMP) is to assist in assessing the health of surface waters within the watershed. The WMP will include current and future growth which could impact the water quality through point and non-point sources of pollution. The WMP will also include all the watershed basins and sub-basins located within the specific service area.

The WMP must be approved by EPD prior to preparing the watershed assessment. EPD require specific Monitoring and Sampling Programs to be implemented prior to authorization to operate and/or expand a wastewater treatment facility. Water Monitoring locations as recommended by EPD are presented in Figure 1 (see Appendix). Water quality and/or bio-assessment parameters will be analyzed at each monitoring location as part of the Watershed Monitoring Plan.

1.3 SCWA Responsibilities

SCWA, as the new owner of Plant #1, is responsible for conducting the Watershed Assessment. Paragon Consulting Group (PCG) has been retained by SCWA to develop the Watershed Assessment, Watershed Monitoring Plan, and Watershed Management Plan.

The Watershed Assessment area, shown in Figure 2, includes the current and future service areas. The current service areas for the plant are portions of HM-1 and portions of SP-1. NE-1, NE-2, NE-3, NE-4, and NE-5 are considered future commercial development. Currently, the land use within the future service areas is mainly agriculture and residential. However, due to the location along a main roadway (Hwy 19/41) it is expected to be developed for commercial use in the long term.

2 Initial Watershed Characterization

2.1 General Location

Spalding County is made up of approximately 128,000 acres bordered on the west by the Flint River and Line Creek. Approximately 55,000 acres, 43 percent of the total County area, drain to the east into waterways within the Ocmulgee River Basin. The remainder of Spalding County drains to the west into waterways within the Flint River Basin.

The Ocmulgee River Basin is located in central Georgia, occupying an area of 6,102 square miles. The northern limit of the basin originates in the eastern part of the City of Atlanta. The Ocmulgee River Basin falls within the Level III Piedmont and Southeastern Plains Ecoregions. The Upper Ocmulgee River (HUC 03070103 shown above) watershed is located in the Level IV Southern Outer Piedmont Sub-ecoregion. The Lower Ocmulgee River (HUC 03070104) and Little Ocmulgee River (HUC 03070105) watersheds are multifaceted watersheds.

Elevations in Spalding County vary from about 660 feet above mean sea level (MSL) near the Towaliga River to about 1,000 feet above MSL near the City of Griffin. Streams and channels to the northeast and east of the City drain into the Ocmulgee River basin, and those streams west and south of the City drain

into the Flint River basin. Major waterways in the Ocmulgee River basin include the Towaliga River, South River, Yellow River, Big Haynes Creek, and the Alcovy River. Downstream the Ocmulgee River joins the Oconee River in middle Georgia to form the Altamaha River, which flows south to the Atlantic Ocean.

2.2 SCWA Plant #1 Service Area

The physical address of SCWA Plant #1 is 209 Cheatham Street, Griffin, Spalding County, Georgia. The effluent from Plant #1 is discharged into Cabin Creek, which in turn discharges into the Towaliga River, also located in Ocmulgee River Basin.

SCWA Plant #1 is temporarily permitted for 0.04 MGD. The current service area is represented in Figure 3 and includes a portion of service area HM-1 known as the Highland Mills Village and the seven houses located in service area SP-1, south of the treatment plant. The future service areas include 11 additional areas as shown in Figure 2 and as defined in the Griffin/Spalding County Wastewater Management Plan 2010-2030 (the Plan).

2.3 Known Potential Pollutants Sources

In the Ocmulgee River basin fecal coliform bacteria, which is attributed to nonpoint source pollution, is the parameter of most concern. Cabin Creek is one of the 74 impaired stream segments within the Ocmulgee River Basin as determined by EPD. Cabin Creek is listed as impaired due to fecal coliform bacteria and biota impacted fish population. EPD attributes the pollution to nonpoint sources, and lists the possible cause as urban runoff. Some forms of pollution EPD considers as nonpoint sources include the following: waste generated by domestic animals, leaks and overflows from sanitary sewer systems, illicit discharges, leaking septic systems, and runoff from improper disposal of waste materials. All of these may contribute to diminished water quality.

Other than the previously mentioned nonpoint sources, no other pollutant sources have been identified for Cabin Creek and its tributaries. SCWA Plant #1 and the City of Griffin's Cabin Creek WPCP, which also discharges into Cabin Creek, are considered as point sources of pollution but function under an NPDES permit with defined discharge limits so that no polluted effluent is discharged to the waterway. In accordance with Georgia EPD rules and regulations, all discharges from point source facilities, such as wastewater treatment plants, are required to be in compliance with the conditions of their NPDES permit at all times. Both permits place a limit of 200 counts per 100 mL as a monthly average for fecal coliform.

According to a Spalding County assessment performed by Jordan, Jones & Goulding, there are no known landfills, RCRA sites, hazardous waste facilities, industrial sites, land application sites, or any other significant facilities which may impact water quality within SCWA Plant #1 service areas. A more detailed investigation will be performed during the Watershed Assessment process.

2.4 Sensitive Environmental Areas

The existing and future service areas for Plant #1 are located within residential neighborhoods. Based on available date there are no wetlands, groundwater recharge areas, or water supply watersheds

within the service areas. A more extensive evaluation of these areas will be performed and the results included in the Watershed Assessment.

2.5 Impaired Waters within the Watershed

Cabin Creek is on the Georgia EPD 303(d) list for Fecal Coliform (FC) and Biota. Biota impairment of these streams is due to sedimentation. Sedimentation is likely related to nonpoint sources such as insufficient stormwater controls, agricultural activities and raw crops, roads and urban development.

The Georgia EPD 305(b)/303(d) list contains impaired streams/rivers located in the vicinity of the studied watershed sub-basin and are not supporting their designated use:

Cabin Creek for 16 miles from headwaters in Griffin to the Towaliga River; its designated use is fishing and it is located in the Ocmulgee River basin.

2.6 Representative Maps

The existing service area for Plant #1 contains areas HM-1 and SP-1. Future commercial/industrial and residential development of Spalding County is described in Griffin/Spalding County Wastewater Management Plan 2010-2030 (the Plan). The Plan includes the SCWA development strategy for their water and sewer utilities. According to the Plan, the future extended service area for Plant #1 is going to be developed in two major stages:

1. Near future development stage (5 to 10 years) to include sub-basins in service areas HS-1, HS-3, HS-4, HM-1, SP-1, and SP-2
2. Distant future development stage (20 to 25 years) to include sub-basins in service areas NE-1, NE-2, NE-3, NE-4 and NE-5

These service areas are represented in Figure 2. The Plan also explains how the projected wastewater flow of 1.0 MGD is obtained based on the estimated water usage for 10 sub-basins shown in Figure 3. A significant proposal regarding the HS-2 service area is made in the Plan due to economic reasons. Because service area HS-2 is located closer to the City of Griffin's Cabin Creek WWTP than to Plant #1, it is proposed that sewerage from this service area be serviced by the City of Griffin's Cabin Creek WWTP.

3 Methodology for Collection of Field Data

3.1 Description of Surroundings

Each monitoring site has been selected to ensure easy access for sample collection. Some of the monitoring sites are located in rural areas with trees and shrubs surrounding the sites. Four of the five monitoring sites are not surrounded by any obvious agricultural activities or livestock.

Each of the stream channels are of the natural, sinuous type and have silty bottoms. There is no evidence of algal bloom in the water surrounding any of the proposed monitoring sites and no noticeable animal interference (e.g. beaver dams, etc.) of the flows. There are no sediment retention ponds near any of the monitoring sites. Each stream proposed for monitoring is crossed by a road at one or more locations.

The proposed monitoring sites were visited after a rain event, so the water in most of the stream was not clear due to recent stormwater runoff.

3.2 Monitoring Sites

The following watershed monitoring sites have been selected as advised by the Georgia EPD Watershed Monitoring Division (WMD):

Site NH-1 (33.268005, -84.261273)

Site NH-1 is located on Cabin Creek downstream from the Plant #1 effluent discharge point. This site is situated within a residential/retail commercial area. The creek is crossed by North Hill Street at the monitoring location. The creek continues its course through brush, as shown in the Appendix. During rain events the creek receives runoff from the impervious sites located near the monitoring point. There is no evidence of livestock present in the vicinity of the monitoring location. WMD has recommended monitoring this site for water quality only.

Site NH-2 (33.289712, -84.26256)

Site NH-2 is located on an unnamed tributary to Troublesome Creek. North Hill Street crosses the creek at this location. There is no residential area located nearby. The creek forms a marsh on each side of the road. The west side of the marsh has a lot of debris such as car tires, old furniture, pieces of old metal, etc. Stormwater from the road and pastures located uphill from the site are collected by this marsh during rain events. Livestock was not obvious around the site. WMD has recommended monitoring this site for water quality only.

Site JH-3 (33.312138, -84.247271)

Site JH-3 is located on Troublesome Creek. Jordan Hill Road crosses the creek at this location. No residences, industries, or commercial developments are in the vicinity of the monitoring site. The creek course flows mostly through wooded areas, and the creek appears to have a silty bottom. There is no evidence of erosion on either side of the creek. WMD has recommended monitoring this site for water quality and bioassessment.

Site PR-4 (33.305648, -84.30211)

Site PR-4 is located on Heads Creek, which is crossed at this location by Patterson Road. The creek is well maintained on the west side of the road in a long basin with secured rip-rap on each side. On the east side of the road, the creek flows through a wooded area and collects water from two visible tributaries. No erosion of the creek banks is evident near the monitoring site. WMD has recommended monitoring this site for water quality and bioassessment.

Site CR-5 (33.289879, -84.306075)

Site CR-5 is located on an unnamed tributary to Heads Creek. Cowan Road crosses the creek at this location. The creek runs through a wooded area surrounding this site. There are no residences, industries, or commercial sites located within visible distance of the monitoring site. A sewer line appears to run parallel to the creek approximately 30 to 35 feet away. Evidence of silty accumulation is noticeable within the creek banks. WMD has recommended monitoring this site for water quality only.

3.3 Water Quality Monitoring

Each site will be monitored for water quality. The following parameters are recommended to be included as part of each sampling event for WQ Assessment:

Parameter	Units
Air Temperature*	Degrees Celsius
Water Temperature*	Degrees Celsius
pH*	Standard Units
Dissolved Oxygen*	mg/L
Dissolved Oxygen Saturation*	Percent
Specific Conductance*	µS/cm
Salinity*	µg/L
Turbidity*	NTU
Fecal Coliform[1]	MPN/100mL
Escherichia coli[1,2]	MPN/100mL
5-Day Biochemical Oxygen Demand[2]	mg/L
Chemical Oxygen Demand	mg/L
Total Suspended Solids	mg/L
Total Phosphorus	mg/L
Ortho-Phosphate	mg/L
Ammonia Nitrogen	mg/L
Nitrate/Nitrite Nitrogen	mg/L
Total Nitrogen or Total Kjeldahl Nitrogen	mg/L
Cadmium[4]	µg/L
Copper[4]	µg/L
Lead[4]	µg/L
Zinc[4]	µg/L
Alkalinity	mg/L as CaCO3
Total Hardness	mg/L as CaCO3
Measured or Estimated Stream Flow	Cubic Feet per Second
Any 303(d) listing violation	
Any stream specific parameter	

* *In situ* measurements

1 - The fecal coliform bacteria water quality standard is based on a geometric mean consisting of at least four samples collected within a 30-day period at intervals not less than 24 hours. A minimum of two fecal coliform geometric means should be calculated for the period from May through October. The samples should be distributed evenly over the 30-day period, and collected regardless of weather conditions. (E. coli should be sampled in the same manner.)

2 - Alternatively, Enterococci should be sampled for tidally influence streams

3 - A reporting limit of 2.0 mg/L should be utilized

4 - Total Recoverable or Dissolved may be analyzed. If Total Recoverable is chosen, the Dissolved fraction must be calculated and reported for comparison to water quality standards. Ensure laboratory reporting limits less than or equal to the applicable water quality standard are utilized.

A minimum of three dry-weather grab samples will be collected for water quality analysis. The criterion for a dry-weather sample is a period of at least 72 hours since the last rainfall of 0.1 inches or greater. At least one of the dry-weather sample events should be conducted during critical conditions (i.e., low flow, high temperature) to determine if water quality standards are being met.

At least one wet-weather event sample will be collected and analyzed. It is recommended by EPD to collect a composite sample which covers the complete hydrograph. The composite sample should be from either grab samples or from an automated composite sampler. The suggested wet-weather criteria are at least 0.2 inches of rainfall and at least 72 hours since the last storm event.

Collection of all samples will follow the USEPA approved sampling methods as per Title 40 of the *Code of Federal Regulations (CFR).* The GAEPD has developed general guidelines for surface water sampling titled Water Quality: Quality Assurance Manual, June 1999 (revised 2005). The sample types will be grab samples and 24-hour composite samples. Analysis of water quality parameters must be conducted according to approved test procedures provided in 40 CFR Part 136 (*Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act).*

Metals samples will be collected using Clean Techniques as described by USEPA in its *Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria,* USEPA, October 1, 1993.

The proposed service area to be served by Plant #1 is illustrated in Figure 1. This figure also contains monitoring sites locations and major roads crossing the waterbodies. Figure 2 shows significant waterways (creeks) and water bodies (small lakes) within the watershed, elevations in the watershed and where residential areas are present.

3.4 Biological Monitoring

Biological assessments, also known as bioassessments, will be conducted at two of the selected monitoring sites, JH-3 and PR-4, in addition to the required water quality monitoring. Bioassessments are necessary to establish the health of the benthic macroinvertebrate and fish communities for the waterbodies within the assessment area. Bioassessments must be conducted at least once at each site. The sampling index period for macroinvertebrate assessments is from the beginning of October through the end of February, and fish assessments should be conducted from the beginning of April through mid-October.

The following must be included when conducting bioassessments:

1. Complete biological assessment
2. Scientific Collecting Permit issued by the Wildlife Resources Division
3. Dates of bioassessment
4. Follow the EPD Standard Operating Procedures (SOPs) for bioassessment
5. Sampling dates for each fish or micro-invertebrates should be different, not the same day
6. Conduct stream reconnaissance for fish assessment
7. Perform 'In Situ' measurements and grab samples immediately before biological samples are collected
8. Indicate the Level IV Ecoregion metrics used for calculations of Macroinvertebrate Multimetric Index (MMI) for macroinvertebrate

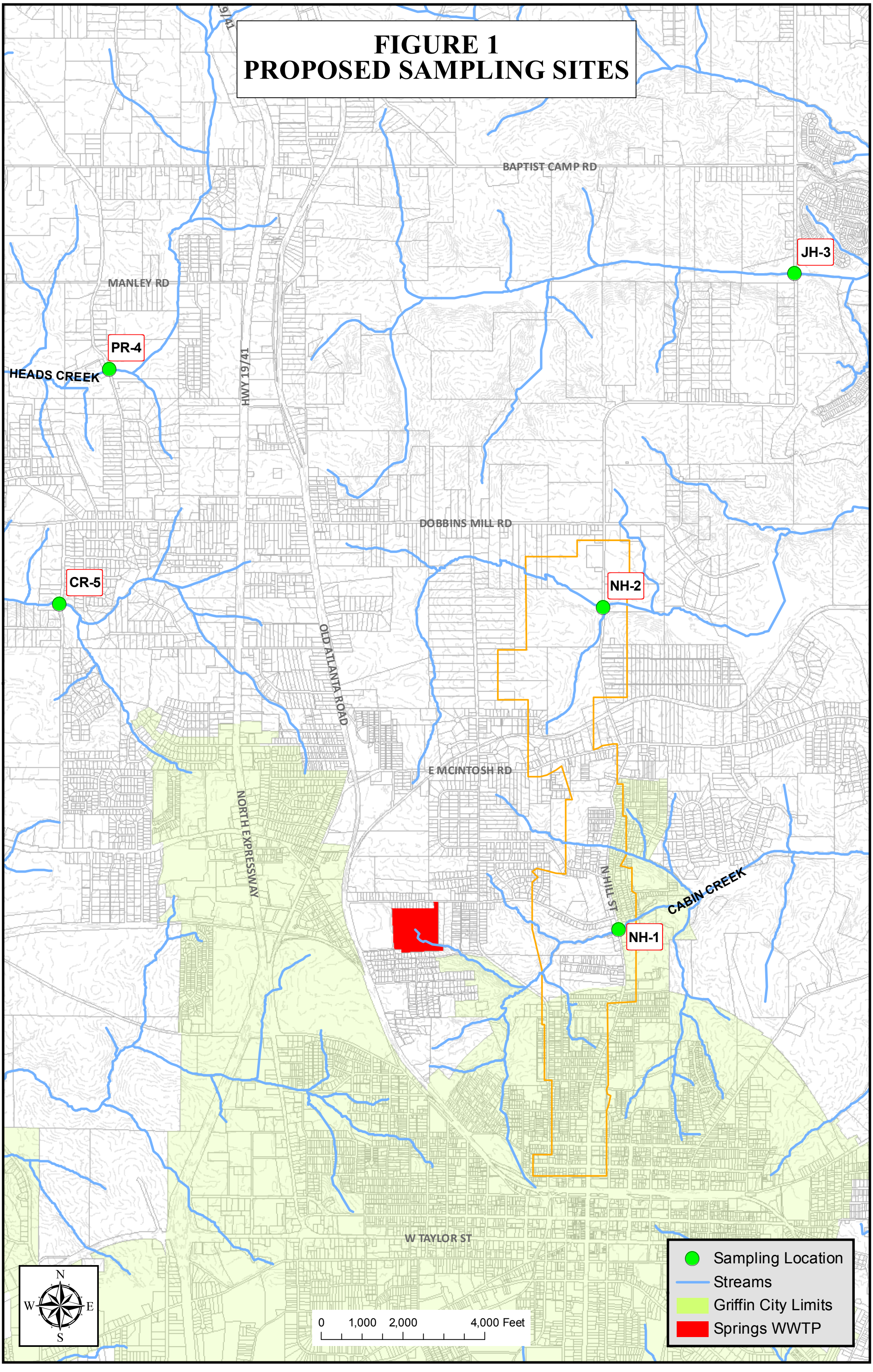
9. Indicate the river basin and Level III Ecoregion metrics used for the calculation of the Index of Biotic Integrity (IBI) scores for fish assessments

Field reconnaissance of all sites will be performed prior to the start of any monitoring to ensure access is available and conditions are safe throughout the monitoring period.

Documentation regarding sampling collection, field measurements, equipment and equipment calibration, what specific parameters are collected, and target periods will be be prepared daily. Proper Quality Assurance and Quality Control (QA/QC) procedures will be employed throughout the monitoring process to provide evidence that the data collected is accurate and precise enough to address the water quality concerns.

APPENDIX

FIGURE 1
PROPOSED SAMPLING SITES



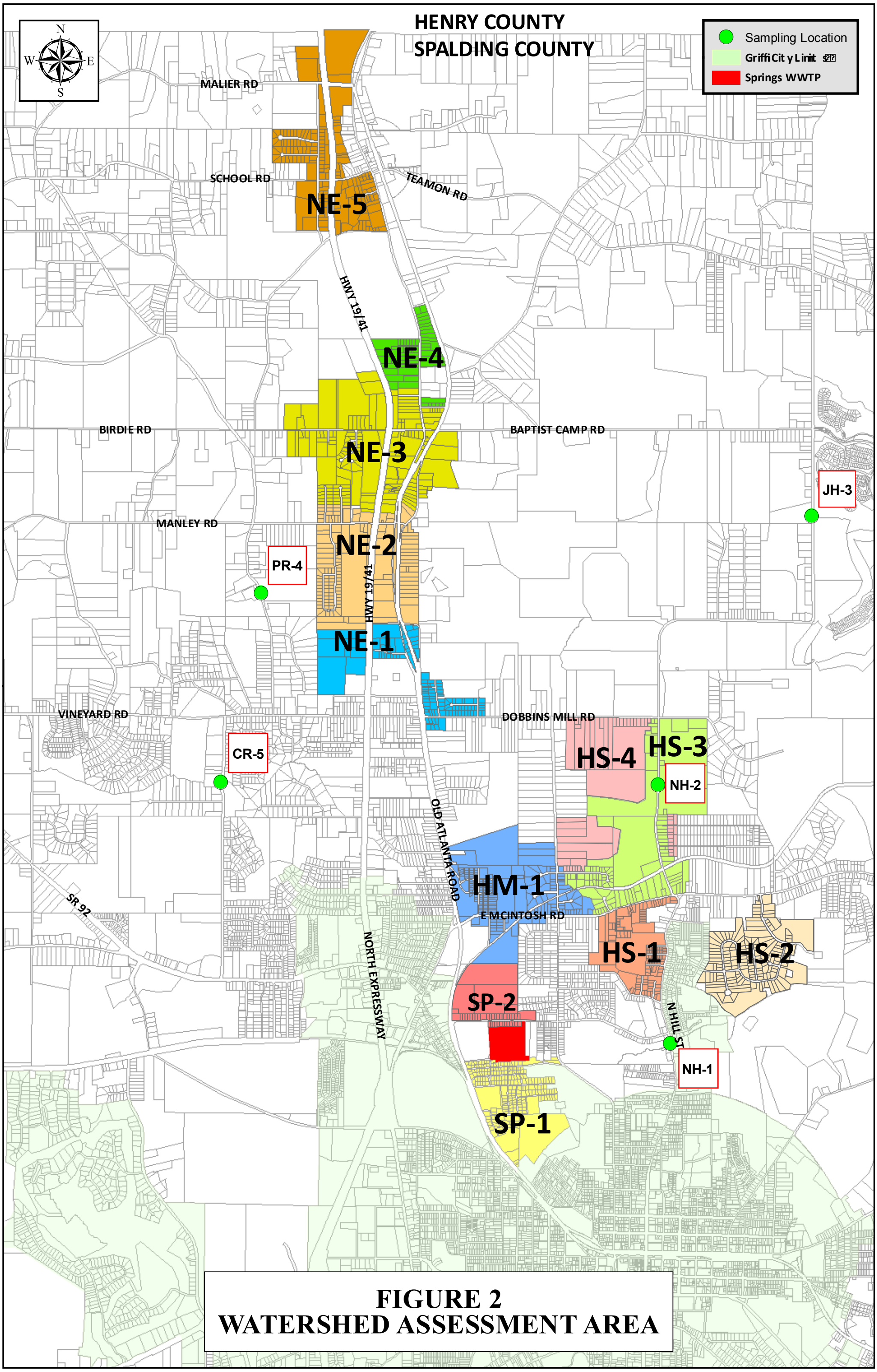


FIGURE 2
WATERSHED ASSESSMENT AREA

HENRY COUNTY
SPALDING COUNTY

N
W E
S

MALIER RD
SCHOOL RD
TEAMON RD
HWY 19/41
BIRDIE RD
BAPTIST CAMP RD
MANLEY RD
VINEYARD RD
DOBBINS MILL RD
OLD ATLANTA ROAD
E MCINTOSH RD
NORTH EXPRESSWAY
N HILL ST
SR 92

NE-5
NE-4
NE-3
NE-2
NE-1
HS-4
HS-3
HM-1
HS-1
HS-2
SP-2
SP-1

LEGEND

1 HM-1 Service Area: 54,118 gpd
2 HS-1 Service Area: 31,580 gpd
3 SP-1 Service Area: 30,000 gpd
4 NE-1 Service Area: 72,415 gpd
5 NE-2 Service Area: 61,508 gpd
6 NE-3 Road Service Area: 136,691 gpd
7 NE-4 Service Area: 26,843 gpd
8 NE-5 Service Area: 98,470 gpd
9 HS-2 Service Area: 38,460 gpd
10 HS-3 Service Area: 96,153 gpd
11 HS-4 Service Area: 65,660 gpd
12 SP-2 Future Service Area: 27,016 gpd
13 IND-1: Reserved Industrial: 250,000 gpd

TOTAL FLOW: 988,914 GPD

- North Hill Corridor
- Revised Cabin Creek Service Area
- Revised Shoal Creek Service Area
- Original City of Griffin Service Areas
- Griffin City Limits
- Springs WWTP

FIGURE 3
SCWA PLANT #1
PROPOSED SERVICE AREA

Monitoring Site NH-1

Monitoring Site NH-1

Monitoring Site NH-2

Monitoring Site NH-2

Monitoring Site JH-3

Monitoring Site JH-3

Monitoring Site PR-4

Monitoring Site PR-4

Monitoring Site CR-5

Monitoring Site CR-5