6.0 Effects of Plant Operation

This chapter provides descriptions of the potential impacts of the operation of the proposed Project. To the extent practicable, the potential operational impacts are quantified and assessed in terms of duration (i.e., long-term or short-term) and character (i.e., adverse or beneficial and significant or minimal). As described, all impacts have been avoided and minimized to the extent practicable. These impact assessments provide reasonable assurance that the operation of SCCF will comply with all applicable nonprocedural requirements of agencies.

6.1 Effects of the Operation of the Heat Dissipation System

Potential effects due to operation of the heat dissipation system include temperature effects from the cooling tower blowdown upon discharge to the receiving waters as well as potential effects from operation of the cooling water intake structure (i.e., impingement and entrainment). Potential temperature effects are discussed in Section 6.1.1. Section 6.1.2 summarizes potential intake effects, discussed in more detail in the 316(b) demonstration information in Appendix 10.2.1.

6.1.1 Temperature Effects on Receiving Water Body

The condenser cooling system for the proposed Project will consist of a 16-cell, closed-cycle, mechanical draft cooling tower for heat dissipation. Evaporative cooling towers operate by using the latent heat of water evaporation to cool recirculating water. The facility also uses the waste heat from the combustion process to generate steam and electricity. Use of closed-cycle cooling and combined-cycle generation will greatly reduce facility cooling water demand relative to an open-cycle facility of the same electrical output.

Blowdown from the proposed SCCF cooling tower will be combined with blowdown from the Remaining SGS Unit's natural draft cooling tower and discharged to the St. Johns River via the existing outfall structure designated as D-001. The assessment of the thermal component of the discharge against ambient water quality temperature criteria and existing NPDES permit temperature limits was conducted using predicted average and maximum temperatures of the blowdown discharges and maximum and average ambient river temperatures, as well as the maximum temperature differential between the intake and discharge. Pursuant to Rule 62-302.520(4)(a), F.A.C., ambient water quality criteria for temperature in fresh water rivers are:

> "Heated water with a temperature at the POD more than 5º F higher than the ambient (natural) temperature of any stream shall not be discharged into such stream. At all times under all conditions of stream flow the discharge temperature shall be controlled so that at least two-thirds (2/3) of the width of the stream's surface remains at ambient (natural) temperature. Further, no more than one-fourth (1/4) of the cross-section of the stream at a traverse perpendicular to the flow shall be heated by the discharge. … In Peninsular Florida, heated waters above 92º F shall not be discharged into fresh waters."

Pursuant to Rule 62-302.520(6)(c), if a permittee is granted a mixing zone, "any otherwise applicable temperature limitations contained in Rule 62-302.520, F.A.C., shall be met at its boundary . . . .":

Table 6.1.1-1 provides the thermal-related limits in the existing NPDES permit for Units 1 and 2.

Table 6.1.1-1. Existing NPDES Permit Thermal Limits

Parameter	Units	Limit	Statistical Basis
Temperature	°F	96.3	Maximum daily average
	°F	98.9	Instantaneous
Mixing zone			
Maximum temperature	m^2	2.0	Maximum
Temperature rise	m^2	18.5	Maximum

Note: °F = degree Fahrenheit.
m^2 = square meter.

Sources: FDEP, 2012.
ECT, 2017.

The heated water discharge from the proposed Project is expected to have an average operating temperature of 86°F. Since April 2011, the average discharge temperature from the Existing SGS Units has been 81.2°F. The current average daily discharge flow from the Existing SGS Units is 5.66 MGD. The anticipated average daily discharge of the Remaining SGS Unit will be 3.72 MGD. The projected average daily flow for SCCF is 2.01 MGD. This yields a predicted daily average combined discharge temperature of 82.9°F, which is lower than the temperature limit in the existing NPDES permit.

The predicted maximum discharge temperature from the Project is 95°F. The maximum recorded discharge temperature for the Existing SGS Units dating back to 2001 is 95.4°F. The current maximum instantaneous permit limit is 98.9°F. The addition of SCCF is not expected to increase the discharge temperature at Outfall D-001. However, a modification of the existing thermal mixing due to the addition of the 15-port diffuser was addressed in the NPDES renewal application currently under review by FDEP.

The maximum differential between the ambient (intake) and discharge temperature occurs during the winter. The maximum differential recorded over the current NPDES permit cycle beginning in April 2011 is 22.9°F. For modeling purposes, SECI analyzed the maximum temperature differential (delta T) observed dating back to 2001. The maximum recorded delta T was 26.3°F, corresponding to an ambient temperature of 51.7°F and an effluent temperature of 78.0°F. The temperature differential from ambient at the edge of a thermal mixing zone should not exceed 5°F per Rule 62-302.520(6)(c), F.A.C.; therefore, a thermal mixing zone based on the temperature differential water quality criterion (WQC) between the discharge temperature and ambient is also required, in addition to the mixing zone for maximum temperature described herein. Table 6.1.1-2 summarizes the thermal characteristics and required dilution factors to meet the permit requirements for the combined discharge and ambient river temperature of SCCF and the Remaining SGS Unit.

Table 6.1.1-2. Thermal Properties of Discharge and Ambient River Conditions

Constituent	Units	Maximum Value Outfall D-001	Ambient River Concentration 95th Percentile	Dilution Factor Required
Maximum temperature	°F	98.9	88.1	2.82
Delta temperature	°F	26.3		5.26

Source: SECI, 2017.
ECT, 2017.

To quantify the mixing zone sizes, the CORMIX Version 4.1 model was used for the calculations to simulate initial jet turbulent mixing and transformation of the discharge plume by buoyant spreading, turbulent dispersion, and advective mixing. The model is capable of simulating a single-port submerged discharge, submerged multiport diffusers, or a surface discharge. The submerged multiport discharge option, which is consistent with the existing SGS structures, was used to simulate Outfall D-001 mixing zones in the St. Johns River under different conditions.

The thermal mixing zone model predicted a mixing zone of 0.1 meter to meet WQC for maximum temperature and 0.3 meter for temperature differential WQC, extending over the submerged multiport diffuser length of 8.5 meters. Due to the tidal influence and reversing flow in the St. Johns River at the discharge location, the mixing zone was modeled in the upstream and downstream direction, which yielded a total area of 0.8 square meter (m^2) for maximum temperature and 2.4 m^2 for temperature differential. Table 6.1.1-3 provides the resulting CORMIX predicted mixing zone required to meet regulatory criteria with SCCF and the Remaining SGS Unit.

Table 6.1.1-3. Predicted Thermal Mixing Zone Required Based on CORMIX Output

Constituent	Mixing Zone (m^2)
Maximum temperature	0.8
Delta temperature	2.4

Source: ECT, 2017.

As shown in Table 6.1.1-3, the sizes of the predicted mixing zones for both maximum temperature and temperature delta for the combined discharge are significantly smaller than the currently permitted thermal mixing zones for SGS. This is primarily the result of the multiport diffuser on the discharge pipe, which was not present when the current NPDES permit was issued. Therefore, the thermal impact of the discharge, including the proposed SCCF and Remaining SGS Unit, is expected to be negligible.

6.1.2 Effects on Aquatic Life

6.1.2.1 Intake

The proposed Project will use the existing SGS intake structure. SECI designed the existing intake structure with multiple safeguards to minimize likelihood of impingement and entrainment. These measures are generally more stringent than the requirements of the 316(b) rule for both existing and new facilities (EPA, 2014; EPA, 2001). The following provides a summary of the measures adopted in design and placement of the cooling water intake structure to minimize potential effects of impingement and entrainment for important species and the supporting food chain:

- Use of closed-cycle recirculating cooling, consistent with Track 1 of the 316(b) new facilities rule (EPA, 2001). Such a system reduces intake flow by more than 95 percent relative to a similar once-through cooled facility, resulting in a commensurate decrease in impingement and entrainment effects.

- Use of submerged wedgewire screens to passively exclude debris and aquatic organisms. Such systems have been demonstrated to minimize impingement without excessive handling that may occur with more traditional traveling water screens. Wedgewire screens have also been shown to reduce entrainment, even in organisms smaller than the slot size, by inducing an avoidance response in the organisms (Coutant, 2015; Zeitoun *et al*., 1981).
- Through-slot velocity of less than 0.5 fps, assumed by EPA to allow fish to avoid impingement. The proposed intake volume with SCCF and the Remaining SGS Unit will slightly decrease through-slot velocity from daily maximum of 0.28 fps to 0.20 fps.
- Screen slot size of 2 millimeters, less than most larvae that might be subject to entrainment. Also, it is smaller than the larvae[1] of sturgeon species (7.8 millimeters total length upon hatching [Smith, *et al*., 1980; Smith, *et al*., 1982]) some suggest may one day reestablish a breeding population within the St. Johns River (USACE, 2013; Section 6.1.2.4).
- Intake structure placed beyond the submerged aquatic vegetation beds in deeper waters outside navigation channels to avoid nursery habitat present within the vegetation beds (SECI, 1979).

Based on the safeguards above, the potential impingement and entrainment impacts of cooling water withdrawals to SCCF on aquatic life in the St. Johns River are expected to be minimal.

6.1.2.2 Water Quantity

No change in the maximum withdrawal or discharge limits is being requested as part of this SCA; therefore, the operation of SCCF will not have adverse impacts relative to intake or discharge flows.

6.1.2.3 Discharge

The mixing zones in the current NPDES permit were calculated based on the original single-port diffuser. SECI submitted a mixing zone reevaluation plan in July 2014 to support addition of the multiport diffuser, and the diffuser was installed in November 2015. In February 2017, SECI submitted an NPDES permit renewal application and mixing zone analysis to FDEP, which is currently under review. The resulting mixing zones in the renewal application were significantly smaller for all constituents analyzed than those in the current permit. Table 6.1.2-1 summarizes the mixing zone sizes in the current NPDES permit, requested in the NPDES renewal application, and proposed with the Project.

[1] 2.5-millimeter sturgeon eggs are not susceptible to entrainment, as they are demersal and adhesive (Smith et al., 1980; Smith et al., 1982).

Table 6.1.2-1. Current Effluent Limit and Permitted and Requested Mixing Zone Sizes

Parameter	Current Effluent Limit	Mixing Zone Size (m^2) Current Permit	Requested Permit Renewal	Remaining Unit + SCCF
Total recoverable copper	139 µg/L	723	20.3	20.3
Total cyanide	19.6 µg/L	125	6.5*	3.9
Total recoverable iron	1.7 mg/L	1.2	0.4	0.4
Total recoverable mercury	0.09 µg/L	67,323	10.9	10.9
Total recoverable selenium	11.7 µg/L	5.8	0.8	0.8
Specific conductivity	8,653 µmhos/cm	176	8.8	8.8
Temperature	98.9 °F	2.0	0.8	0.8
Temperature rise	26.3 °F	18.5	2.5	2.4

*Based on a total cyanide requested effluent limit of 24 µg/L. SECI anticipates retaining the 19.6-µg/L effluent limit, resulting in a 3.9-m^2 mixing zone.

Sources: FDEP, 2012.
ECT, 2017.

As shown in Table 6.1.2-1, the mixing zones for all SGS Remaining Unit and SCCF constituents will be significantly smaller than the currently permitted sizes and similar to those requested in the NPDES renewal application for Existing SGS Units 1 and 2. The Project combined effluent will be compliant with Florida’s water quality standards. These standards are deemed to be protective of designated uses, including aquatic life, at the permitted limits of the mixing zone. Impacts to aquatic biota will be limited due to the immediate location of the discharge within the St. Johns River: in deeper water, outside vegetation beds, in a location separate from the influence of the intake, and outside the deeper navigational channel. Sensitive or significant aquatic species (see Section 6.1.2.4) are not expected to be impacted by the SCCF effluent within the mixing zones.

6.1.2.4 Threatened or Endangered Species

Three federally listed aquatic species have been recorded to occur or are likely to occur in the St. Johns River within the vicinity of the SGS site (Atlantic sturgeon, shortnose sturgeon, and West Indian manatee).

It is unlikely any of the listed aquatic species that might occur in the vicinity of the intake would be impinged due to the use of wedgewire screens with maximum 0.5-fps design intake velocity. Neither sturgeon species were identified in any of the zones surveyed within the St. Johns River as part of the Fisheries-Independent Monitoring (FIM) stratified random sampling program and are unlikely to be present within the area of the cooling water intake structure (FIM Program Staff, 2016). The demersal spawning behavior and adhesive nature of sturgeon eggs, combined with the use of fine mesh wedgewire screens, limits the potential for entrainment of the larval stages for the two sturgeon species. The Florida manatee is unlikely to be impinged due its large size and the strong swimming ability of both the adults and juveniles. In addition, USFWS determined the operation of SGS Units 1 and 2 will “neither jeopardize the existence of the manatee nor adversely affect its habitat” (U.S. Rural Electrification Energy Association, 1979).

Manatees have an affinity for warm waters during cold weather periods and are often found in the discharge of electric generating stations (FWC, 2017). Manatees, though present within the St. Johns River near SGS, have not been observed to congregate near the discharge. This may be due to location of the discharge in deeper waters and use of cooling towers resulting in a small thermal discharge volume and existing mixing zone (18.5 m^2). The proposed Project in addition to the existing multiport diffuser will reduce the size of the thermal mixing zone to 2.4 m^2. Through a reduction in mixing zone size, the changes associated with the proposed Project are not expected to result in adverse impacts to manatees because they do not currently congregate in the mixing zone area.

6.1.3 Biological Effects of Modified Circulation

The design of the cooling water intake structure for the Existing SGS Units was deemed to be “best technology available” at the time and continues to be so under new EPA 316(b) regulations. The proposed SCCF Project does not include any modifications to the existing cooling water intake structure. No increase to the permitted maximum annual withdrawal (43.24 MGD) is being proposed as part of SCCF.

The SCCF with the Remaining SGS Unit will not result in a measurable change to the discharge circulation pattern from what is currently occurring. SECI is not proposing any changes to the existing discharge structure or permitted discharge volume. Therefore, no adverse impacts to aquatic biota are anticipated.

6.1.4 Effects of Offstream Cooling

Cooling towers transfer heat from plant processes to the atmosphere through the evaporation and dispersion of cooling water. Depending on the meteorological conditions, warm, moist air leaving a tower may become cooled to the point of saturation, causing the water to condense and form a visible plume. Ground level fogging and/or icing may occur if this plume does not rise and dissipate after being emitted from the cooling tower. An additional potential impact from a cooling tower can occur when the drift from a tower carries dissolved and suspended solids (mostly salt), which could be deposited locally and may have the potential to affect soils and vegetation. The frequency and magnitude of these potential impacts are dependent on the size, design, and location of the cooling tower, as well as meteorological conditions.

SCCF will include one 16-cell (each cell having a diameter of approximately 36′) mechanical draft cooling tower, equipped with high-efficiency drift eliminators, or similar devices, with drift not exceeding 0.0005-percent of inlet circulating water flow. The cooling tower will be used to cool the condenser cooling water and other plant heat exchangers. The cooling tower will be located south of the SCCF power block. Cooling tower cells will be arranged in a two-by-eight configuration, oriented in a southwest-northeast direction, and have a height of 60′ above grade. Air flow exiting the cooling tower will be approximately 480 cfs per cell and 91°F.

Because of direct contact between the cooling water and ambient air, a portion of the recirculating cooling water is entrained in the air stream as drift droplets. SCCF will use drift eliminators or similar devices designed to remove all but 0.0005 percent by weight of the entrained water droplets. Therefore, only a small portion of entrained water droplets are released into the atmosphere. These water droplets contain the same concentration of dissolved solids as found in the recirculating cooling water. Large water droplets quickly settle out of the cooling tower exhaust stream and deposit near the tower. The remaining smaller water droplets may evaporate prior to being deposited in the area surrounding the cooling tower. These evaporated droplets represent potential particulate matter (PM)/PM_{10}/$PM_{2.5}$ emissions because of the fine PM/PM_{10}/$PM_{2.5}$ formed by crystallization of the dissolved solids contained in the droplets.

6.1.4.1 Cooling Tower Plume Visibility/Fogging

When a visible plume is formed from a cooling tower, the extent to which it will disperse and dissipate will vary depending on the prevailing meteorological conditions. The location of a visible plume may vary significantly from hour to hour, thereby reducing the duration of fogging events.

Due to the generally moderate temperatures that occur all year round in north-central Florida and the significant distance to the nearest roadway or major highway, the SCCF cooling towers are not anticipated to cause any adverse impacts with respect to fogging/icing on either West River Road, US 17, or any other offsite location.

6.1.4.2 Cooling Tower Drift/Deposition Analysis

The amount of salt deposition is directly related to the total dissolved solids (TDS) concentration found in the cooling tower recirculation water and the drift loss from the cooling tower. SCCF cooling tower recirculation water supply will be the St. Johns River with an average TDS concentration of approximately 654 ppm by weight.

The cooling tower will be located well within the property boundaries of the SGS site, thus minimizing any transport of drift and PM beyond the site boundaries. Use of the St. Johns River for cooling tower makeup, which contains a relatively low TDS concentration compared to seawater, will assist in minimizing PM emissions.

Therefore, due to the inherently low TDS in the St. Johns River water (i.e., approximately 650 ppm in river versus approximately 3,000 ppm in seawater) and the utilization of high-efficiency drift eliminators or similar devices designed to reduce PM emissions to protective levels, and the distance from the cooling tower to the site property boundary, salt deposition from the SCCF cooling tower is not anticipated to have an adverse effect on onsite and offsite natural vegetation or soils in the vicinity of SGS. Further, drift from the Existing SGS Units cooling tower has not affected vegetation in the area.

6.1.5 Measurement Programs

The current NPDES permit (No. FL0036498-007) for operation of SGS Units 1 and 2 requires periodic monitoring to ensure compliance with the conditions and requirements of the permit. The current NPDES permit has been administratively extended, and SECI has submitted an application to renew the permit to FDEP. Once renewed, it is expected that the permit will include similar monitoring requirements. It is anticipated the revision of the NPDES permit to include SCCF will also include similar monitoring requirements, as SECI is not requesting revisions to any of those requirements.

6.2 Effects of Chemical and Biocide Discharges

Section 4.6 describes in detail the use of water treatment chemicals and biocides. This section discusses potential effects of the discharge of these chemicals to the environment.

6.2.1 Industrial Wastewater Discharges

Low-volume industrial wastewater discharges from SCCF operations include SCCF service water systems and floor drains, blowdown from the HRSGs and evaporative coolers, raw water treatment filter backwash, treated sanitary wastewater, and other residual waters from the demineralized water treatment systems. Blowdown from the HRSGs and evaporative coolers will be reused to supplement makeup water to the cooling tower. As discussed in Section 4.6.1, other low-volume wastewaters will be routed to the onsite wastewater collection sump. Wastewaters from floor and equipment drains throughout the plant, which may be exposed to oily products, will be collected and treated through an oil/water separator prior to being routed to the collection sump. The wastewaters will be treated, as appropriate, combined with the cooling tower blowdown, and discharged along with the Remaining SGS Unit wastewaters and cooling tower blowdown to the St. Johns River through the existing discharge structure, i.e., Outfall D-001.

Effluent from SCCF and the Remaining SGS Unit is expected to be of similar or better quality in comparison to effluent of the Existing SGS Units. Project discharges will be regulated under the approved NPDES permit and are not expected to have adverse effects on water quality and the environment.

6.2.2 Cooling Tower Blowdown

Recirculating water in the cooling tower may be intermittently treated with a soft foulant deposit cleaner/biodetergent chemical to prevent deposits in the cooling system. The cooling water will also be periodically treated with a biocide, and the blowdown will be dechlorinated prior to discharge.

Table 6.2.2-1 identifies constituents and predicted concentrations of the SCCF and Remaining SGS Unit cooling tower blowdown and wastewater plant discharge that will exceed ambient water quality criteria and, therefore, require the proposed mixing zone. These constituents include copper, cyanide, iron, mercury, selenium, specific conductance, and water temperature. The concentrations of these constituents in the SCCF and Remaining SGS Unit combined blowdown and wastewater plant discharge are similar to concentrations from the SGS Units 1 and 2 operations. The CORMIX model was used to estimate the size of the mixing zone required to provide necessary dilution to meet the water quality standard for each of the constituents in the combined cooling tower blowdown and wastewater discharge (see Appendix 10.2.2). The required mixing zone includes discharge flow rates from SCCF and the Remaining SGS Unit and is shown for each constituent in Table 6.2.2-2.

Table 6.2.2-1. Target Analytes Predicted to Exceed Regulatory Criteria

Constituent	Units	Maximum Concentration D-001	Ambient River Concentration 95th Percentile	Dilution Factor Required
Copper	µg/L	139	2.07	17.05
Conductivity	µmhos/cm	8,653	1420	10.19
Cyanide	µg/L	19.6	2.70	6.76
Mercury	µg/L	0.09	0.0047	11.68
Iron	mg/L	1.7	0.47	2.32
Selenium	µg/L	11.7	2.5	3.68
Maximum temperature	°F	98.9	88.2	2.82
Delta temperature	°F	26.3		5.26

Source: ECT, 2017.

Table 6.2.2-2. Predicted Mixing Zone Based on CORMIX Output

Constituent	Currently Permitted Mixing Zone (m^2)	Proposed Mixing Zone with SCCF Project (m^2)
Copper	723	20.3
Cyanide	125	3.9
Iron	1.2	0.4
Mercury	67,323	10.9
Selenium	5.8	0.8
Specific conductivity	176	8.8
Maximum temperature	2.0	0.8
Delta temperature	18.5	2.4

Source: ECT, 2017.

As discussed in Section 6.1.2.3, the predicted mixing zones to meet water quality standards for the constituents in the discharge for the Remaining SGS Unit and SCCF are significantly smaller than the permitted mixing zones for Existing SGS Units' operations. This reduction is primarily due to the existing multiport diffuser at the end of the discharge pipeline. Therefore, the combined cooling tower blowdown and wastewater discharge from D-001 is not expected to adversely impact environmental conditions in the St. Johns River.

6.2.3 Measurement Programs

As part of the existing consumptive water use approval and NPDES permit conditions, the SGS facility monitors and records surface water and groundwater withdrawals and internal processes flow rates. SGS also samples internal and external outfalls for multiple parameters. The existing sampling regimen is expected to continue for the Remaining SGS Unit and be applied to the proposed SCCF.

6.3 Impacts on Water Supplies

6.3.1 Surface Water

SCCF will use surface water to supply cooling tower makeup water to replace losses from evaporation and blowdown. The St. Johns River has the capacity to provide sufficient water to meet SCCF's surface water needs as the SCCF will remain within the existing SGS surface water allocation and SGS' historic use within the allocation has not caused any known harmful effects. Surface water of sufficient quality and quantity is available and currently authorized in the existing COCs. The anticipated annual average withdrawal for the Remaining SGS Unit and SCCF is 6,093 MGY (16.69 MGD), which is less than the currently approved withdrawal of 15,783 MGY (43.24 MGD) in the current SGS COCs. Operation of SCCF will, therefore, not have an adverse impact on the river flows and levels.

The SJRWMD has established criteria for determining whether a proposed water withdrawal meets the non-procedural consumptive use permitting requirements. The SCCF's proposed use of St. Johns River surface water meets these criteria as follows:

- *Demonstration of demand or need for the requested use* – The SCCF in combination with the remaining SGS Unit have an adequate demand or need for the requested surface water withdrawal as described in Section 4.5.
- *Non-interference with existing legal users* – The SCCF in combination with the remaining SGS Unit satisfies this requirement since there will be no increase in the surface water allocation. In addition, there have been no instances of interference with any existing legal user of surface water from the St. Johns River resulting from SGS's existing surface water withdrawal.
- *Water source is suitable for the consumptive use* – The St. Johns River is of adequate quality and quantity to meet the needs of the SCCF and the Remaining SGS Unit as these units can satisfactorily operate on the River's existing water quality without causing harmful environmental impacts.

- *The source of the water is capable of producing the requested amount* – The St. Johns River can produce the quantity of water requested for the SCCF and remaining SGS Unit as more particularly detailed below.
- *The St. Johns River is the technically, economically, and environmentally feasible lowest quality water source suitable for the purpose* – The St. Johns River is the lowest quality water source suitable for cooling tower makeup that is technically, economically, and environmentally feasible to use. As explained in Appendix 10.8, Section B2, the St. Johns River is tidally influenced water. There are no opportunities for reclaimed water use in proximity to the site, and use of captured stormwater is not technically feasible.
- *The St. Johns River use will not harm existing offsite land uses* – The St. Johns River use is only a small percentage of river flow (as explained below) and will not cause any hydrologic alteration that would result in flooding or lower water tables that would impact any existing offsite land use. The SGS's historic St. Johns River use has not caused any known harm to existing offsite land uses.
- *The St. Johns River use will not cause harmful water quality impacts to the water source* – The St. Johns River use will not cause saline water intrusion into the River or any other harmful water quality impacts. The existing SGS St. Johns River use has not caused any known adverse water quality impacts to the River.
- *The St. Johns River use will not cause harmful hydrologic alterations to natural systems* – The proposed SCCF and Remaining SGS Unit withdraw will not cause flow rates to deviate from their normal rate and range of fluctuation such that adverse impacts would occur. Based upon guidance from SJRWMD staff, these withdrawals were analyzed to determine if they reduced the rate of daily flow in the St. Johns River by more than 10 percent at any point in the drainage system. The annual average recorded streamflow in the area of SGS is 4,171 MGD as recorded from USGS Station 0224450 from 1968 through 1982. Ten percent of the total flow would equate to an allowable consumptive use of 417 MGD on an annual average basis. The average net consumptive use for the proposed Project is 4.92 MGD (i.e., 6.93 MGD withdrawal minus 2.01 MGD discharge), which comprises only 0.12 percent of the average daily flow. Based on the estimated flows for SCCF and the Remaining SGS unit, average consumptive use would be 0.26 percent of the average river flow. The proposed withdrawal represents a small percentage of the river flow and will, therefore, not have an adverse impact of the river's ecology.

- *The St Johns River use will not cause or contribute to a violation of state water quality standards in receiving waters* – As discussed in Sections 6.1 and 6.2; all return flows from the St. Johns River use will meet applicable NPDES requirements.
- *There are no established minimum flows or levels or water reservations located downstream of the SGS site* – Therefore, the St. Johns River use is not subject to any minimum flow or level or water reservation restrictions nor subject to any minimum flow or level implementation strategy.

6.3.2 Groundwater

Plant potable and process water will continue to be supplied to the Remaining SGS Unit by groundwater using existing Upper Floridan aquifer production wells. The maximum annual withdrawal rate currently authorized for Existing SGS Units is 200.75 million gallons per year (0.55 MGD). The Remaining SGS Unit average annual flow rate is 0.31 MGD. (Of note, SGS Units 1 and 2 were originally approved to withdraw 0.85 MGD. In 1999, SECI requested a modification to voluntarily decrease the allocation to 0.55 MGD so the remaining 0.3 MGD could be used by Continental Building Products [formerly Lafarge North America, Inc.]).

The SCCF will also use water from the Upper Floridan aquifer for HRSG steam cycle makeup water and other general plant uses (collectively "SCCF service water"). General plant uses will include equipment wash water, pump seals, evaporative cooler makeup water, and emergency fire water. Groundwater will also be used for potable water. Groundwater will be supplied by two new wells for SCCF service water and one for potable water, delivering a total projected average annual flow rate of 0.307 MGD. The combined SCCF and Remaining SGS Unit projected average annual flow rate is 0.62 MGD.

Regionally, groundwater in the Upper Floridan aquifer flows to the southeast (USGS, 2011). The groundwater flow within the surficial aquifer is anticipated to coincide with site topography, also flowing to the southeast toward the St. Johns River.

Waste streams within the plant are not expected to impact the surficial or Floridan aquifer. No waste disposal ponds are planned for the site, and no discharges to groundwater other than a noncontact stormwater pond are proposed. Waste streams from the proposed Project, including from the pretreatment filters, plant equipment drains, oil/water separator, and sanitary wastewater, flow to the wastewater collection sump prior to being discharged to the St. Johns River through Outfall D-001.

Should an unlikely release of contaminants occur from the plant, the underlying Hawthorn Formation, which extends to a depth of approximately 5′ below land surface to 100′ below land surface and separates the surficial aquifer from the Upper Floridan aquifer, would provide a confining layer to minimize vertical downward migration of contaminants into the Upper Floridan aquifer. A release within the shallow groundwater would flow horizontally, presumably to the southeast following the topographic gradient approximately 4,000′ to the south before impacting the nearest surface water body, the St. Johns River. Based on horizontal distance to the nearest surface water body and depth of the confining layer, an unlikely potential environmental release at the plant is not expected to impact surface water bodies or the Upper Floridan aquifer.

6.3.2.1 Consumptive Use Resource Evaluation

The Project's proposed Upper Floridan groundwater use meets the SJRWMD non-procedural consumptive use permitting requirements as follows:

- *Demonstration of demand or need for the requested use* – The SCCF in combination with the Remaining SGS Unit have an adequate demand or need for the requested groundwater water withdraw as provided in more detail in section 4.5.
- *Non-interference with existing legal users* – SECI performed groundwater modeling using data from the SJRWMD's northeast Florida regional model to evaluate effects of the proposed SCCF groundwater consumptive use combined with the groundwater use for the Remaining SGS Unit. A flow rate of 0.31 MGD average annual daily flow was applied to the existing wells used to service the Remaining SGS Unit, and a pumping rate of 0.307 MGD average annual daily flow was applied to the proposed wells providing water to SCCF. The 0.307 MGD pumping rate was split into a 0.3053 MGD withdrawal for process water and a 0.0014 MGD for potable use. Groundwater Vistas, a software package for three-dimensional groundwater flow and contaminant transport modeling using the MODFLOW suite of codes, was used to simulate this proposed pumping rate from the Upper Floridan aquifer.

  The modeling results indicate a drawdown of approximately 2.5′ within the Upper Floridan aquifer at the nearest property boundary with the Continental Building Products, and 1′ to 2′ drawdown at other property boundaries resulting from the combined drawdown of the existing 0.31 MGD for the Remaining SGS Unit and the proposed 0.307 MGD withdrawal for the SCCF. When evaluating the net effects of the SCCF, the 0.62 MGD withdrawal increases drawdown at the property boundary by approximately 0.4′ as compared to the predicted drawdown resulting from the existing 0.55 MGD water use allocation (see

Figure 6.3.2-2). In addition to the relatively small increase in drawdown, as discussed in Section 3.3.3.2 and shown in Figure 3.3.3-1, there are few existing users with consumptive use permits within the immediate vicinity of the SGS site. All but one of these users is located at least 3 to 4 miles from the SCCF site area. As shown in Figures 6.3.2-1 and 6.3.2-2, the drawdowns in the Upper Floridan aquifer based on the existing SGS compared to proposed withdrawals with SCCF and the Remaining SGS Unit are predicted to be essentially the same within approximately 2.5 miles from the SCCF site area. The existing SGS withdrawals have not impacted existing users. Therefore, the proposed drawdowns are not expected to adversely impact other legal users of groundwater in the vicinity of the SGS site.

- *Water source is suitable for the consumptive use* – The Upper Floridan aquifer is of adequate quality and quantity to meet the high quality needs of the SCCF and the Remaining SGS Unit as explained in Section 4.5 and Appendix 10.8, Section B2.
- *The Upper Floridan aquifer is the technically, economically, and environmentally feasible lowest quality water source suitable for the SCCF and Remaining SGS Unit high quality needs* – As more fully explained in Section 4.5 and Appendix 10.8, the Upper Floridan aquifer is the lowest quality water source suitable for boiler feedwater and other high quality needs that is technically, economically, and environmentally feasible to use. Even with the higher quality water, the groundwater will require additional treatment prior to use for HRSG steam cycle makeup, equipment wash water, evaporative coolers, and pump seals. There are no wastewater treatment plants with available reclaimed water in proximity to the plant. In any event, reclaimed water typically has elevated levels of dissolved solids that would require extensive and expensive treatment, along with a method of disposal. Use of St. Johns river water would have similar water quality and treatment issues. Use of stormwater is impractical due to the large area that would be disturbed and soil conditions onsite.
- *The Upper Floridan Aquifer use will not harm existing offsite land uses* – As described in more detail in section 6.3.2.2, the surficial aquifer drawdown resulting from the Project's proposed groundwater use is minimal and will not harm any existing offsite land uses.
- *The Upper Floridan aquifer use will not cause harmful water quality impacts to the water source* – The Upper Floridan aquifer use will not cause the movement of any known contamination plumes or result in harmful saline water intrusion or upconing. Therefore, the upper Floridan aquifer use will not cause harmful water quality impacts to the water source.

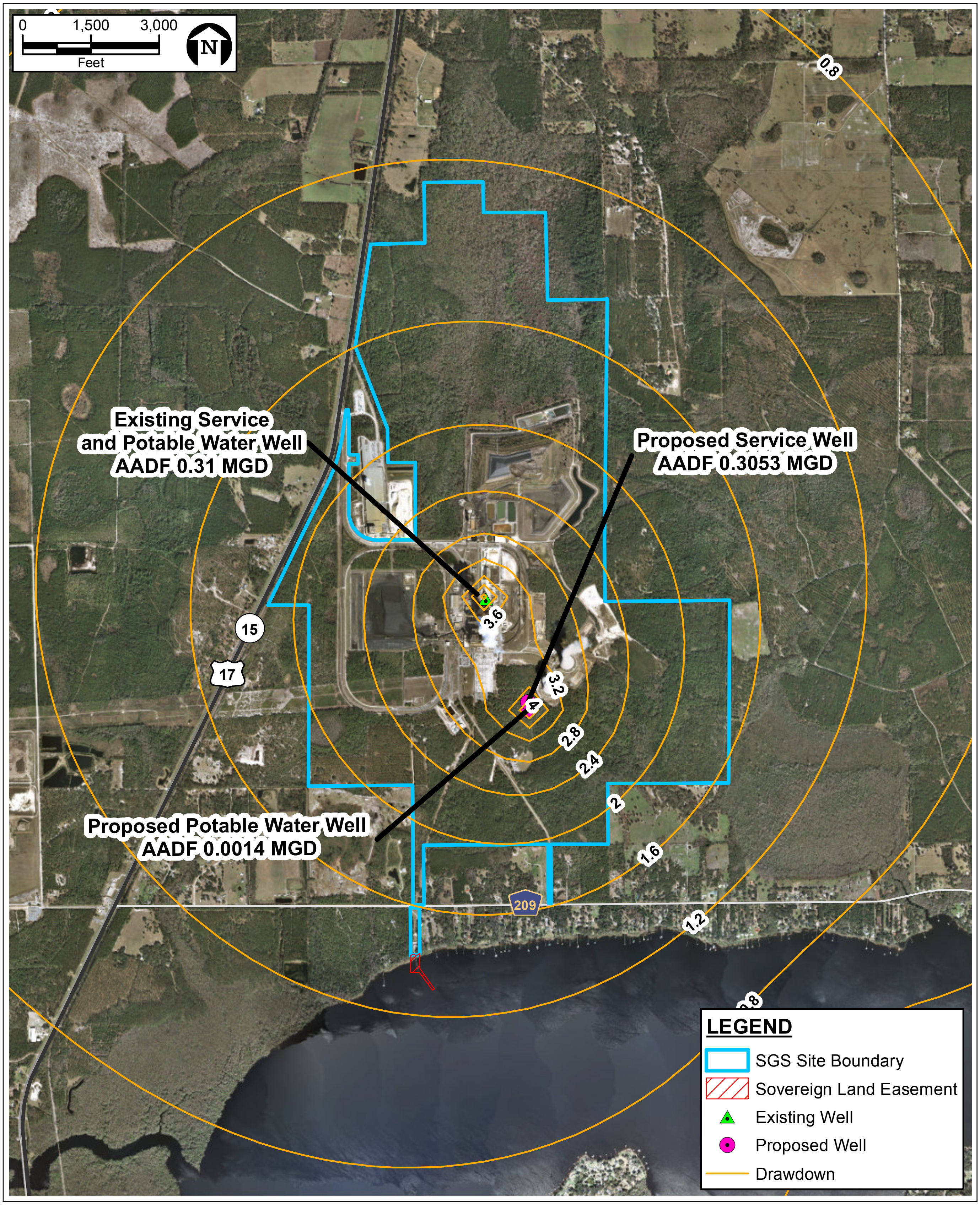

FIGURE 6.3.2-1.
UPPER FLORIDAN AQUIFER DRAWDOWN ANALYSIS
PROPOSED WITHDRAWAL

Sources: SJRWMD, 2016; FDOT, 2017; ECT, 2017.

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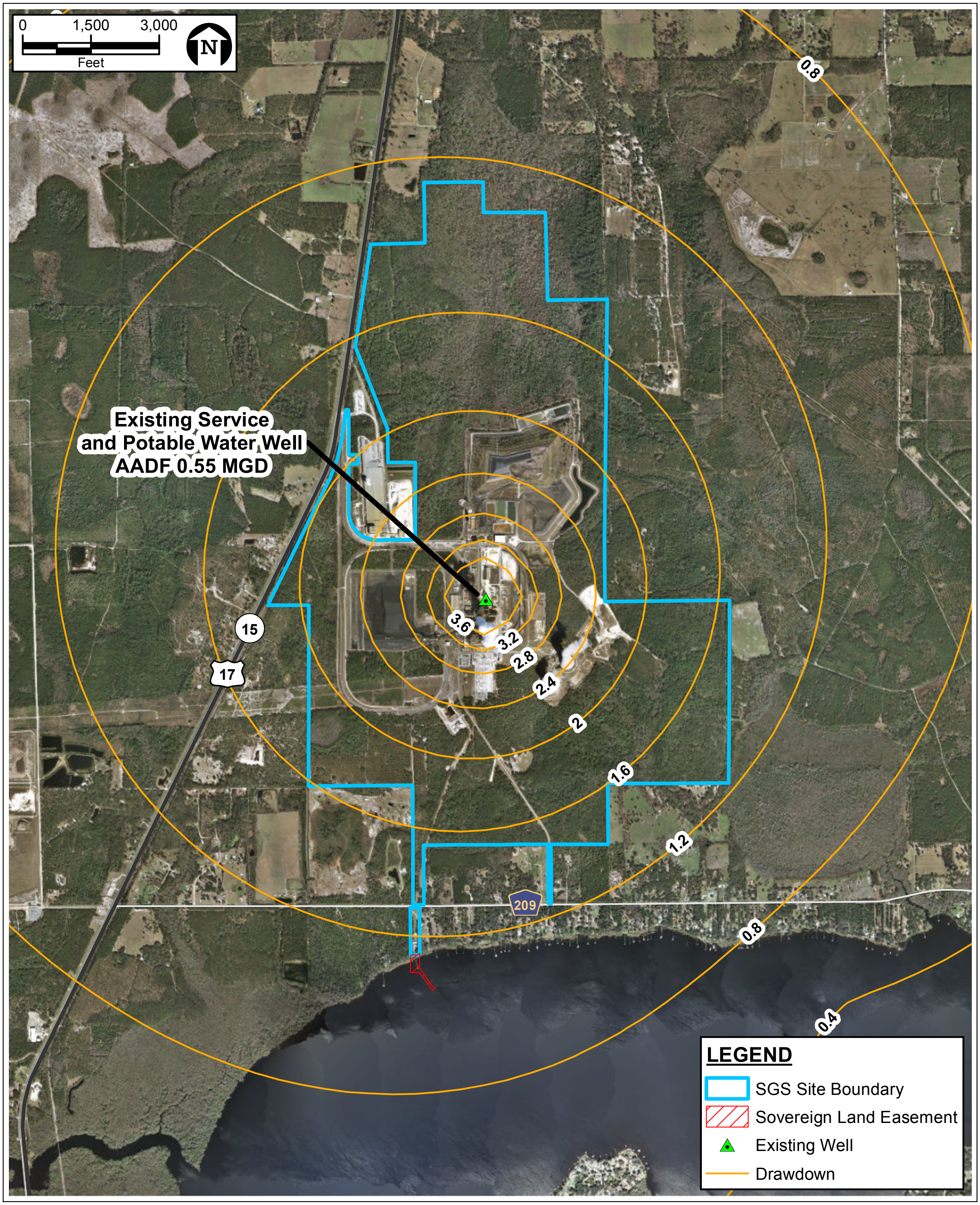

FIGURE 6.3.2-2.
UPPER FLORIDAN AQUIFER DRAWDOWN ANALYSIS
EXISTING WITHDRAWAL

Sources: SJRWMD, 2016; FDOT, 2014, 2016; ECT, 2017.

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- *The Upper Floridan aquifer use will not cause harmful hydrologic alterations to natural systems and is capable of producing the requested amount* – As explained in detail in section 6.3.2.2 below, the Project's Upper Floridan aquifer use will not produce a surficial aquifer drawdown significant enough to impact natural systems.
- *The Upper Floridan use will not cause or contribute to a violation of state water quality standards in receiving waters* – As discussed above, no waste disposal ponds are planned for the site, and no discharges to groundwater other than a noncontact stormwater pond are proposed. The stormwater pond will not be used for return flows of groundwater. Therefore, the proposed groundwater use will not affect groundwater quality standards.
- *The Upper Floridan aquifer use will not significantly impact any established minimum flows or levels or any water reservations* – As requested by SJRWMD, the Suwannee River Water Management District (SRWMD) north Florida water use simulation model was used to simulate the effects of the combined existing and proposed Project pumping rate from the SGS site on rivers, lakes and springs with approved minimum flows and levels within SRWMD territory. The model results indicate a minimal reduction in flow in water bodies of SRWMD, as shown in Table 6.3.2-1. As shown in the table, the predicted changes in flow are far below the 0.15-cfs criteria that SJRWMD considers significant. For example, the predicted change in flow in the Santa Fe River near Fort White is approximately 0.023 cfs and in the Ichetucknee River at U.S. Highway 27 near Hildreth is 0.002 cfs. Thus, the Project's proposed groundwater withdrawals will not have a significant impact on any established MFL. Figure 6.3.2-3, developed using the SJRWMD Northeast Florida regional model, shows the drawdowns of the combined Remaining SGS Unit and proposed Project withdrawal relative to lakes with adopted or to be evaluated MFLs in the SJRWMD in the vicinity of the SGS site. As shown in the figure, drawdowns at the nearest lakes are projected to be less than 0.02′, which is considered insignificant or unmeasurable.
- *The Upper Floridan aquifer use will not impact any established water reservation* – There are no established water reservations in the vicinity of the SGS proposed groundwater use.

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow		
				cfs	%	As Fraction of Consumptive Use Permit
2317620	Alapaha River near Jennings FL	-10.65524225	-10.65518646	5.58E-05	-0.000523456	0.000117537
2319000	Withlacoochee River near Pinetta FL	-171.1316792	-171.1315728	0.00010645	-6.22E-05	0.000224326
2319300	Withlacoochee River near Madison FL	-281.1967795	-281.1964934	0.000286196	-0.000101778	0.000603108
2319394	Withlacoochee River near Lee	-681.9595689	-681.9584818	0.001087122	-0.000159411	0.00229092
2320700	Santa Fe River near Graham	-1.586550116	-1.584487616	0.0020625	-0.129999045	0.00434636
2321000	New River near Lake Butler	-8.942700174	-8.942121944	0.000578229	-0.006465935	0.001218517
2322700	Ichetucknee River at US 27 near Hildreth	-311.2989201	-311.2968345	0.002085648	-0.000669982	0.004395141
2321500	Santa Fe River near Worthington Springs	-56.38502888	-56.38001211	0.005016831	-0.008897452	0.010572099
2321975	Santa Fe River at US 441 near High Springs	-254.4552896	-254.4360399	0.019250764	-0.00756548	0.040567638
2322000	Santa Fe River near High Springs	-363.3850658	-363.3647155	0.020351262	-0.005600467	0.042886746
2322500	Santa Fe River near Fort White	-909.4513413	-909.4287502	0.022591553	-0.002484086	0.047607771
2322800	Santa Fe River near Hildreth	-1681.787371	-1681.762193	0.025177851	-0.001497089	0.053057943
2315000	Suwannee River near Benton	-256.5967537	-256.5955331	0.001220652	-0.000475708	0.002572312
2315500	Suwannee River at White Springs	-275.3169374	-275.3151481	0.00178924	-0.000649884	0.003770512
2315550	Suwannee River at Suwannee Springs	-376.6670228	-376.6594573	0.007565536	-0.002008548	0.015943052
2319500	Suwannee River at Ellaville	-2339.980225	-2339.969503	0.010719591	-0.000458106	0.022589674
2319800	Suwannee River at Dowling Park	-2291.992224	-2291.981487	0.010735193	-0.000468378	0.022622552
2320000	Suwannee River at Luraville	-2426.654811	-2426.643983	0.01082547	-0.000446107	0.022812797
2320500	Suwannee River at Branford	-3166.513914	-3166.502156	0.0117551	-0.000371232	0.02477183
2323000	Suwannee River near Bell	-4901.617686	-4901.580677	0.037005057	-0.000754956	0.077981724
2323500	Suwannee River near Wilcox	-5162.785609	-5162.748588	0.037017789	-0.000717012	0.078008554
2323592	Suwannee River at Gopher River near Suwannee	-5408.825213	-5408.788192	0.037017904	-0.000684398	0.078008798
2313700	Waccasassa River near Gulf Hammock	-481.4959132	-481.4939815	0.001931377	-0.00040112	0.004070042
2324000	Steinhatchee River near Cross City	-18.38221065	-18.38221042	2.33E-07	-1.27E-06	4.90E-07
2324400	Fenholloway River near Foley	4.607627315	4.607628472	1.16E-06	2.51E-05	2.44E-06
2324500	Fenholloway River at Foley	-50.41888808	-50.41888692	1.16E-06	-2.30E-06	2.44E-06
2325000	Fenholloway River near Perry	-70.38014155	-70.38014039	1.16E-06	-1.64E-06	2.44E-06
2326000	Econfina River near Perry	-24.22201678	-24.22201238	4.32E-06	-1.78E-05	9.10E-06
2326526	Wacissa River near Wacissa	-478.4146921	-478.4146921	0	0	0
2326500	Aucilla River at Lamont	-113.4620113	-113.462	1.13E-05	-9.93E-06	2.37E-05

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 2 of 11)

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow		
				cfs	%	As Fraction of Consumptive Use Permit
2326550	Aucilla River near Mouth near Nutall Rise	-1020.082796	-1020.082785	1.13E-05	-1.10E-06	2.37E-05
1	Ala1029101	-0.858207176	-0.858202546	4.63E-06	-0.000539454	9.76E-06
2	Treehouse Spring	-190.3824074	-190.3799769	0.002430556	-0.00127667	0.005121973
3	Ala930971 (Alachua)	-11.72300926	-11.72293981	6.94E-05	-0.000592377	0.000146342
4	Ala930972 (Alachua)	-64.92601852	-64.92565972	0.000358796	-0.000552623	0.000756101
5	Alapaha River Rise	-648.5212963	-648.5202546	0.001041667	-0.000160622	0.002195131
6	Allen Mill Pond Springs	-19.52127315	-19.52126157	1.16E-05	-5.93E-05	2.44E-05
7	Anderson Spring	-18.81298611	-18.81298611	0	0	0
8	Nutall Rise	-358.5202546	-358.5202546	0	0	0
9	Bell Spring (Gilchrist)	-0.977372685	-0.977372685	0	0	0
10	Bell Springs (Columbia)	0	0	0	-1.23E+30	0
11	Betty Spring	-1.015006944	-1.015006944	0	0	0
12	Big Spring (Taylor)	-14.23585648	-14.23585648	0	0	0
13	Blue Creek Spring	-10.48659722	-10.48659722	0	0	0
14	Madison Blue Spring	-150.4380787	-150.4377315	0.000347222	-0.000230807	0.00073171
15	Gilchrist Blue Spring	-41.63290509	-41.63261574	0.000289352	-0.000695008	0.000609759
16	Bonnet Spring	-29.88180556	-29.88179398	1.16E-05	-3.87E-05	2.44E-05
17	Branford Spring	-22.86239583	-22.86237269	2.31E-05	-0.00010125	4.88E-05
18	Bradley Spring	-0.167997685	-0.167997685	0	0	0
19	Levy Blue Spring	-11.24643519	-11.24630787	0.000127315	-0.001132046	0.000268294
20	Blue Sink Spring (Suwannee)	-73.928125	-73.92443287	0.00369213	-0.004994215	0.007780521
21	Bathtub Spring (Suwannee)	-6.380775463	-6.380763889	1.16E-05	-0.00018139	2.44E-05
22	Carlton Spring	-0.660438657	-0.660438657	0	0	0
23	Camp Ground Spring (Taylor)	-0.835695602	-0.835695602	0	0	0
24	Charles Spring	-12.03016204	-12.03015046	1.16E-05	-9.62E-05	2.44E-05
25	Cedar Island Spring (Taylor)	-8.820335648	-8.820335648	0	0	0
26	Columbia Spring	-108.8180556	-108.816956	0.001099537	-0.001010436	0.002317083
27	Col1012971 (Columbia)	-5.477395833	-5.477395833	0	0	0
28	Col1012972 (Columbia)	-3.188541667	-3.188541667	0	0	0
29	Col101971 (Columbia)	-0.179758102	-0.179756944	1.16E-06	-0.000643869	2.44E-06
30	Jonathan Spring	-0.198545139	-0.198543981	1.16E-06	-0.000582944	2.44E-06

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 3 of 11)

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow		
				cfs	%	As Fraction of Consumptive Use Permit
31	Col101974 (Columbia)	-0.895064815	-0.895059028	5.79E-06	-0.000646549	1.22E-05
32	Col101975 (Columbia)	-0.065126852	-0.065126389	4.63E-07	-0.000710863	9.76E-07
33	Col1105041 (Columbia)	-3.197048611	-3.197025463	2.31E-05	-0.000724047	4.88E-05
34	Col428981 (Columbia)	-2.233726852	-2.233703704	2.31E-05	-0.001036302	4.88E-05
35	Allen Spring	-6.717326389	-6.717291667	3.47E-05	-0.000516905	7.32E-05
36	Col522981 (Columbia)	-1.526585648	-1.526168981	0.000416667	-0.027294025	0.000878053
37	Col522982 (Columbia)	-2.289270833	-2.288645833	0.000625	-0.02730127	0.001317079
38	Santa Fe Spring (Columbia)	-56.83228009	-56.82854167	0.003738426	-0.006577997	0.007878083
39	Col61982 (Columbia)	-0.787084491	-0.786969907	0.000114583	-0.014557946	0.000241464
40	Col728101	-0.075368634	-0.075368056	5.79E-07	-0.000767831	1.22E-06
41	Col917971 (Columbia)	-0.47087037	-0.47087037	0	0	0
42	Col928971 (Columbia)	-0.361384259	-0.361384259	0	0	0
43	Myrtles Fissure Spring	-8.00193287	-8.001921296	1.16E-05	-0.000144641	2.44E-05
44	Col930971 (Columbia)	-5.006631944	-5.006608796	2.31E-05	-0.00046235	4.88E-05
45	Convict Spring	-4.888506944	-4.888506944	0	0	0
46	Copper Spring	-18.25114583	-18.25114583	0	0	0
47	Cow Spring	-1.189525463	-1.189525463	0	0	0
48	Darby Spring	-2.335486111	-2.335451389	3.47E-05	-0.001486724	7.32E-05
49	Deer Spring (Gilchrist)	-8.475185185	-8.475162037	2.31E-05	-0.000273129	4.88E-05
50	Devils Ear Spring (Gilchrist)	-118.9105324	-118.9101852	0.000347222	-0.000292003	0.00073171
51	Dix625991 (Dixie)	-10.48467593	-10.48467593	0	0	0
52	Dix625992	-1.780960648	-1.780960648	0	0	0
53	Dix625993 (Dixie)	-56.35228009	-56.35228009	0	0	0
54	Dix625994 (Dixie)	-10.31811343	-10.31811343	0	0	0
55	Dix95971 (Dixie)	-0.461224537	-0.461224537	0	0	0
56	Dogwood Spring	-9.391354167	-9.391331019	2.31E-05	-0.000246484	4.88E-05
57	Devils Eye Spring (Gilchrist)	-34.6675463	-34.66743056	0.000115741	-0.000333859	0.000243903
58	Ellaville Spring	-43.48636574	-43.48635417	1.16E-05	-2.66E-05	2.44E-05
59	Eva Spring	-2.227766204	-2.227766204	0	0	0
60	Ewing Spring	-0.937552083	-0.937552083	0	0	0
61	Fanning Springs	-107.4452546	-107.4452546	0	0	0
62	Fletcher Springs	-7.063125	-7.063125	0	0	0

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 4 of 11)

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow		
				cfs	%	As Fraction of Consumptive Use Permit
63	Folsom Spring	-2.124363426	-2.124363426	0	0	0
64	Fenholloway Spring	-0.937552083	-0.937552083	0	0	0
65	Gil1012971 (Gilchrist)	-10.76747685	-10.76747685	0	0	0
66	Gil1012972 (Gilchrist)	-3.188541667	-3.188541667	0	0	0
67	Siphon Creek Rise	-318.8542824	-318.8540509	0.000231481	-7.26E-05	0.000487807
68	Gil1012974 (Gilchrist)	-69.24300926	-69.24291667	9.26E-05	-0.000133721	0.000195123
69	Johnson Spring	-0.469344907	-0.469341435	3.47E-06	-0.000739802	7.32E-06
70	Gil107971 (Gilchrist)	-28.03099537	-28.03099537	0	0	0
71	Gil107972 (Gilchrist)	-28.86668981	-28.86667824	1.16E-05	-4.01E-05	2.44E-05
72	Gil729971 (Gilchrist)	-2.617523148	-2.617523148	0	0	0
73	Gil729972 (Gilchrist)	-0.286208333	-0.286208333	0	0	0
74	Gil729973 (Gilchrist)	-0.290326389	-0.290326389	0	0	0
75	Gil84971 (Gilchrist)	-9.39630787	-9.39630787	0	0	0
76	Troop Spring	-0.729915509	-0.729915509	0	0	0
77	Gil917972 (Gilchrist)	-0.55203588	-0.55203588	0	0	0
78	Gil917973 (Gilchrist)	-0.291319444	-0.291319444	0	0	0
79	Gil928971 (Gilchrist)	-0.258915509	-0.258915509	0	0	0
80	Gil928972 (Gilchrist)	-0.203052083	-0.203052083	0	0	0
81	Little Otter Spring	-16.60126157	-16.60125	1.16E-05	-6.97E-05	2.44E-05
82	Gil99971 (Gilchrist)	-0.347952546	-0.347952546	0	0	0
83	Gil99972 (Gilchrist)	-1.902314815	-1.902314815	0	0	0
84	Gil99974 (Gilchrist)	-0.687980324	-0.687979167	1.16E-06	-0.000168233	2.44E-06
85	Ginnie Spring	-42.57761574	-42.57753472	8.10E-05	-0.000190284	0.000170732
86	Guaranto Spring	-3.152418981	-3.152418981	0	0	0
87	Hampton Spring (Taylor)	-0.833944444	-0.833944444	0	0	0
88	Ham1017971 (Hamilton)	-1.777789352	-1.777789352	0	0	0
89	Ham1017972 (Hamilton)	-0.919634259	-0.919630787	3.47E-06	-0.000377566	7.32E-06
90	Ham1017973 (Hamilton)	-0.338909722	-0.338908565	1.16E-06	-0.000341509	2.44E-06
91	Ham1017974 (Hamilton)	-5.027893519	-5.027881944	1.16E-05	-0.000230197	2.44E-05
92	Ham1019971 (Hamilton)	-2.707835648	-2.707835648	0	0	0
93	Ham1019972 (Hamilton)	-1.04994213	-1.04994213	0	0	0
94	Ham1023971 (Hamilton)	-24.42892361	-24.42891204	1.16E-05	-4.74E-05	2.44E-05

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 5 of 11)

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow		
				cfs	%	As Fraction of Consumptive Use Permit
95	Ham522981 (Hamilton)	-4.651550926	-4.651481481	6.94E-05	-0.001492931	0.000146342
96	Ham54011	-28.48736111	-28.48731481	4.63E-05	-0.000162515	9.76E-05
97	Ham54012 (Hamilton)	-7.694224537	-7.694224537	0	0	0
98	Ham610981 (Hamilton)	-32.1237037	-32.12368056	2.31E-05	-7.21E-05	4.88E-05
99	Ham610982 (Hamilton)	-28.90226852	-28.90226852	0	0	0
100	Ham610983 (Hamilton)	-30.40856481	-30.40854167	2.31E-05	-7.61E-05	4.88E-05
101	Ham610984 (Hamilton)	-20.29729167	-20.29726852	2.31E-05	-0.000114046	4.88E-05
102	Tanner Spring (Hamilton)	-94.90844907	-94.90833333	0.000115741	-0.00012195	0.000243903
103	Ham612982 (Hamilton)	-7.269837963	-7.269826389	1.16E-05	-0.000159207	2.44E-05
104	Seven Sisters Spring (Hamilton)	-13.53858796	-13.53858796	0	0	0
105	Ham923972 (Hamilton)	-1.087111111	-1.087109954	1.16E-06	-0.000106466	2.44E-06
106	Ham923973 (Hamilton)	-9.26556713	-9.265555556	1.16E-05	-0.000124915	2.44E-05
107	Hart Springs	-71.48303241	-71.48303241	0	0	0
108	Heilbronn Spring	0	0	0	-1.23E+30	0
109	Holton Creek Rise	-137.6672454	-137.6668981	0.000347222	-0.000252218	0.00073171
110	Hornsby Spring	-56.64789352	-56.64726852	0.000625	-0.001103307	0.001317079
111	Ichetucknee Head Spring (Suwannee)	-36.45961806	-36.45927083	0.000347222	-0.000952347	0.00073171
112	Blue Hole Spring (Columbia)	-91.7852662	-91.78439815	0.000868056	-0.000945746	0.001829276
113	Mission Springs	-67.97400463	-67.97358796	0.000416667	-0.000612979	0.000878053
114	Devils Eye Springs (Suwannee)	-35.71715278	-35.71704861	0.000104167	-0.000291643	0.000219513
115	Mill Pond Springs (Columbia)	-20.13793981	-20.1378588	8.10E-05	-0.000402318	0.000170732
116	Cedar Head Spring	-4.882638889	-4.882592593	4.63E-05	-0.000948182	9.76E-05
117	Grassy Hole Spring	-2.081435185	-2.081435185	0	0	0
118	Coffee Springs	-1.558587963	-1.558587963	0	0	0
119	Iron Springs (Dixie)	-0.612787037	-0.612787037	0	0	0
120	Jamison Springs	-0.548262731	-0.548262731	0	0	0
121	Jabo Spring	0	0	0	-1.23E+30	0
122	Jef312991 (Jefferson)	-0.660668981	-0.660668981	0	0	0
123	Jef63991	-9.206168981	-9.206168981	0	0	0
124	Jef63992 (Jefferson)	-9.206168981	-9.206168981	0	0	0
125	Jef63993 (Jefferson)	-23.21864583	-23.21864583	0	0	0
126	Jef64991 (Jefferson)	-39.25270833	-39.25270833	0	0	0

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 6 of 11)

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow		
				cfs	%	As Fraction of Consumptive Use Permit
127	July Spring	-67.59013889	-67.58994213	0.000196759	-0.000291106	0.000414636
128	Laf1024001 (Lafayette)	-1.365833333	-1.365833333	0	0	0
129	Laf57981 (Lafayette)	-1.946712963	-1.946701389	1.16E-05	-0.000594544	2.44E-05
130	Laf57982 (Lafayette)	-2.945625	-2.945613426	1.16E-05	-0.000392924	2.44E-05
131	Laf710981 (Lafayette)	-1.121497685	-1.121496528	1.16E-06	-0.000103202	2.44E-06
132	Laf718971 (Lafayette)	-14.16509259	-14.16508102	1.16E-05	-8.17E-05	2.44E-05
133	Laf718972 (Lafayette)	-17.79378472	-17.79375	3.47E-05	-0.000195137	7.32E-05
134	Laf919971 (Lafayette)	-0.329734954	-0.329734954	0	0	0
135	Laf919972 (Lafayette)	-1.39556713	-1.395555556	1.16E-05	-0.000829346	2.44E-05
136	Laf922975 (Lafayette)	-1.885613426	-1.885613426	0	0	0
137	Laf922976 (Lafayette)	-0.711600694	-0.711600694	0	0	0
138	Laf922977 (Lafayette)	-1.693819444	-1.693819444	0	0	0
139	Laf924971 (Lafayette)	-12.91537037	-12.91537037	0	0	0
140	Laf924972 (Lafayette)	-0.448164352	-0.448164352	0	0	0
141	Laf929971 (Lafayette)	-8.371319444	-8.37130787	1.16E-05	-0.000138259	2.44E-05
142	Laf929972 (Lafayette)	-0.339228009	-0.339228009	0	0	0
143	Laf929973 (Lafayette)	-10.02553241	-10.02552083	1.16E-05	-0.000115446	2.44E-05
144	Laf93971 (Lafayette)	-2.814652778	-2.814652778	0	0	0
145	Lafayette Blue Spring	-83.60773148	-83.60770833	2.31E-05	-2.77E-05	4.88E-05
146	Little Copper Spring	-3.187303241	-3.187303241	0	0	0
147	Little Devil Spring	-1.189097222	-1.189097222	0	0	0
148	Levy Blue Spring	0	0	0	-1.23E+30	0
149	Lev97991 (Levy)	-3.46099537	-3.46099537	0	0	0
150	Little Fanning Spring	-11.38354167	-11.38354167	0	0	0
151	Lilly Spring	-27.04226852	-27.04211806	0.000150463	-0.000556399	0.000317075
152	Lime Spring (Suwannee)	-24.57990741	-24.57989583	1.16E-05	-4.71E-05	2.44E-05
153	Louise Springs	-0.936446759	-0.936425926	2.08E-05	-0.002224722	4.39E-05
154	Little River Spring	-76.03271991	-76.03259259	0.000127315	-0.000167447	0.000268294
155	Lime Run Spring or Sink (Suwannee)	-98.25862269	-98.25857639	4.63E-05	-4.71E-05	9.76E-05
156	Luraville Spring	-4.504571759	-4.504571759	0	0	0
157	Mad610981 (Madison)	-5.262418981	-5.262418981	0	0	0
158	Mad610982 (Madison)	-32.1237037	-32.12368056	2.31E-05	-7.21E-05	4.88E-05

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 7 of 11)

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow		
				cfs	%	As Fraction of Consumptive Use Permit
159	Mad612981 (Madison)	-15.19497685	-15.19496528	1.16E-05	-7.62E-05	2.44E-05
160	Mad612982 (Madison)	-15.20844907	-15.20842593	2.31E-05	-0.000152206	4.88E-05
161	Mad922971 (Madison)	-0.835601852	-0.835601852	0	0	0
162	Mad922972 (Madison)	-0.877568287	-0.877568287	0	0	0
163	Mad922973 (Madison)	-0.789702546	-0.789702546	0	0	0
164	Mad922974 (Madison)	-0.814637731	-0.814637731	0	0	0
165	Mad922975 (Madison)	-0.764924769	-0.764924769	0	0	0
166	Mad922976 (Madison)	-0.499171296	-0.499170139	1.16E-06	-0.000231866	2.44E-06
167	Fara Spring	-10.42607639	-10.42607639	0	0	0
168	Manatee Spring	-233.8131944	-233.8131944	0	0	0
169	Mattair Springs	-22.99428241	-22.99423611	4.63E-05	-0.000201338	9.76E-05
170	Mccrabb Spring	-10.32717593	-10.32717593	0	0	0
171	Mearson Spring	-61.5747338	-61.57462963	0.000104167	-0.000169171	0.000219513
172	Morgan Spring	-17.6355787	-17.6355787	0	0	0
173	Oasis Spring	-0.169101852	-0.169100694	1.16E-06	-0.000684444	2.44E-06
174	Orange Grove Spring	-21.98715278	-21.98715278	0	0	0
175	Otter Spring	-6.430509259	-6.430509259	0	0	0
176	Owens Spring	-36.84449074	-36.84444444	4.63E-05	-0.000125653	9.76E-05
177	Peacock Springs (Suwannee) #1	-51.44821759	-51.44819444	2.31E-05	-4.50E-05	4.88E-05
178	Perry Spring	-7.296944444	-7.29693287	1.16E-05	-0.000158615	2.44E-05
179	Pickard Spring	-3.302465278	-3.30244213	2.31E-05	-0.000700935	4.88E-05
180	Poe Spring	-50.89962963	-50.89939815	0.000231481	-0.00045478	0.000487807
181	Pot Hole Spring	-22.47791667	-22.47790509	1.16E-05	-5.15E-05	2.44E-05
182	Pot Spring	-39.0903588	-39.09030093	5.79E-05	-0.000148043	0.000121952
183	Rock Bluff Springs	-29.45731481	-29.45730324	1.16E-05	-3.93E-05	2.44E-05
184	Rock Sink Spring	-14.70208333	-14.70208333	0	0	0
185	Ruth Spring (Lafayette)	-9.390914352	-9.390891204	2.31E-05	-0.000246495	4.88E-05
186	Royal Spring	-7.585474537	-7.585462963	1.16E-05	-0.000152582	2.44E-05
187	Rum Island Spring	-27.35123843	-27.35103009	0.000208333	-0.000761696	0.000439026
188	Running Springs #1	-26.73975694	-26.7397338	2.31E-05	-8.66E-05	4.88E-05
189	Running Springs #2	-36.42164352	-36.42162037	2.31E-05	-6.36E-05	4.88E-05
190	Sawdust Spring	-9.391354167	-9.391331019	2.31E-05	-0.000246484	4.88E-05

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 8 of 11)

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow		
				cfs	%	As Fraction of Consumptive Use Permit
191	Suwannee Blue Spring	-10.31790509	-10.31789352	1.16E-05	-0.000112175	2.44E-05
192	Suwanacoochee Spring	-37.43024306	-37.43023148	1.16E-05	-3.09E-05	2.44E-05
193	Santa Fe River Rise (Alachua)	-350.146412	-350.1420139	0.004398148	-0.001256088	0.009268333
194	Shingle Spring	-4.176770833	-4.176759259	1.16E-05	-0.000277106	2.44E-05
195	Shirley Spring	-1.019704861	-1.019704861	0	0	0
196	Iron Spring (Lafayette)	-1.63181713	-1.63181713	0	0	0
197	Suwannee Springs	-13.83638889	-13.83637731	1.16E-05	-8.36E-05	2.44E-05
198	Steinhatchee Spring	-0.579471065	-0.579471065	0	0	0
199	Steinhatchee River Rise	-561.6983796	-561.6983796	0	0	0
200	Sunbeam Spring	-54.82631944	-54.82625	6.94E-05	-0.000126663	0.000146342
201	Sun Springs	-31.34768519	-31.34768519	0	0	0
202	Suw1017971 (Suwannee)	-5.47943287	-5.479409722	2.31E-05	-0.000422455	4.88E-05
203	Blue Spring (Suwannee)	-17.11592593	-17.11587963	4.63E-05	-0.000270487	9.76E-05
204	Suw1019971 (Suwannee)	-3.664652778	-3.664652778	0	0	0
205	Suw1023971 (Suwannee)	-1.176469907	-1.176469907	0	0	0
206	Suw106971 (Suwannee)	-0.528043981	-0.528042824	1.16E-06	-0.000219188	2.44E-06
207	Suw107971 (Suwannee)	-17.63377315	-17.63377315	0	0	0
208	Suw616101	-6.485219907	-6.485208333	1.16E-05	-0.000178468	2.44E-05
209	Suw718971 (Suwannee)	-5.166226852	-5.166215278	1.16E-05	-0.000224033	2.44E-05
210	Suw725971 (Suwannee)	-7.043587963	-7.043576389	1.16E-05	-0.000164321	2.44E-05
211	Suw917971 (Suwannee)	-0.394065972	-0.394065972	0	0	0
212	Suw917972 (Suwannee)	-0.363174769	-0.363174769	0	0	0
213	Suw919971	-3.158923611	-3.158923611	0	0	0
214	Suw919972 (Suwannee)	-0.816696759	-0.816695602	1.16E-06	-0.000141718	2.44E-06
215	Suw919973 (Suwannee)	-1.457465278	-1.457465278	0	0	0
216	Suw919974 (Suwannee)	-0.288917824	-0.288916667	1.16E-06	-0.000400601	2.44E-06
217	Suw922971 (Suwannee)	-1.622152778	-1.622152778	0	0	0
218	Suw922972 (Suwannee)	-0.92418287	-0.92418287	0	0	0
219	Suw922973 (Suwannee)	-1.945810185	-1.945810185	0	0	0
220	Suw922974 (Suwannee)	-0.925465278	-0.925465278	0	0	0
221	Suw923971 (Suwannee)	-37.76318287	-37.7631713	1.16E-05	-3.06E-05	2.44E-05
222	Suw923972 (Suwannee)	-4.725358796	-4.725358796	0	0	0

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 9 of 11)

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow: cfs	Predicted Change in Flow: %	Predicted Change in Flow: As Fraction of Consumptive Use Permit
223	Stevenson Spring	-132.2680556	-132.2679398	0.000115741	-8.75E-05	0.000243903
224	Suw925971 (Suwannee)	-37.26358796	-37.26349537	9.26E-05	-0.00024848	0.000195123
225	Suw925972 (Suwannee)	-14.30133102	-14.3012963	3.47E-05	-0.00024279	7.32E-05
226	Suw925973 (Suwannee)	-7.391701389	-7.391678241	2.31E-05	-0.000313164	4.88E-05
227	Suw925974 (Suwannee)	-1.717175926	-1.717164352	1.16E-05	-0.000674018	2.44E-05
228	Suw925975 (Suwannee)	-6.485219907	-6.485208333	1.16E-05	-0.000178468	2.44E-05
229	Spring Warrior Spring	-23.21782407	-23.21782407	0	0	0
230	Tay616991 (Taylor)	-9.807615741	-9.807615741	0	0	0
231	Tay616992 (Taylor)	-35.26673611	-35.26673611	0	0	0
232	Tay622991 (Taylor)	-50.19813657	-50.19813657	0	0	0
233	Tay625991 (Taylor)	-2.041967593	-2.041967593	0	0	0
234	Tay625993 (Taylor)	-23.70440972	-23.70440972	0	0	0
235	Tay625995 (Taylor)	-0.908071759	-0.908071759	0	0	0
236	Tay69991 (Taylor)	-5.151180556	-5.151180556	0	0	0
237	Tay69992 (Taylor)	-3.8403125	-3.8403125	0	0	0
238	Tay730991 (Taylor)	-16.49392361	-16.49392361	0	0	0
239	Tay76991 (Taylor)	-5.6553125	-5.6553125	0	0	0
240	Beaver Creek Spring	-119.4096065	-119.4096065	0	0	0
241	Tay77041 (Taylor)	-1.408055556	-1.408055556	0	0	0
242	Tay77042 (Taylor)	-1.202581019	-1.202581019	0	0	0
243	Tay77043 (Taylor)	-8.225381944	-8.225381944	0	0	0
244	Tay77044 (Taylor)	-1.408055556	-1.408055556	0	0	0
245	Jug Island Spring	-29.18368056	-29.18368056	0	0	0
246	Tay924991 (Taylor)	-1.792824074	-1.792824074	0	0	0
247	Tay924993 (Taylor)	-3.553217593	-3.553217593	0	0	0
248	Telford Spring	-40.85929398	-40.85928241	1.16E-05	-2.83E-05	2.44E-05
249	Trail Spring	-2.378402778	-2.378402778	0	0	0
250	Troy Spring	-138.8251157	-138.8248843	0.000231481	-0.000166743	0.000487807
251	Turtle Spring	-24.71912037	-24.71912037	0	0	0
252	Twin Spring	-12.38065972	-12.38063657	2.31E-05	-0.00018697	4.88E-05
253	Waldo Spring	-3.619421296	-3.619421296	0	0	0
254	Wacissa Spring #2	-199.3452546	-199.3452546	0	0	0

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 10 of 11)

Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	Predicted Change in Flow: cfs	Predicted Change in Flow: %	Predicted Change in Flow: As Fraction of Consumptive Use Permit
255	Big Blue Spring (Jefferson)	-49.82803241	-49.82803241	0	0	0
256	Jefferson Blue Spring	-45.80798611	-45.80798611	0	0	0
257	Buzzard Log Spring (Jefferson)	-14.22861111	-14.22861111	0	0	0
258	Cassidy Springs	-43.53574074	-43.53574074	0	0	0
259	Garner Spring	-9.409409722	-9.409409722	0	0	0
260	Horsehead Spring	-13.81077546	-13.81077546	0	0	0
261	Log Spring (Jefferson)	-49.311875	-49.311875	0	0	0
262	Minnow Spring	-14.22861111	-14.22861111	0	0	0
263	Thomas Spring (Jefferson)	-29.34622685	-29.34622685	0	0	0
264	Aucilla Spring	-8.540358796	-8.540358796	0	0	0
265	Woods Creek Rise	-18.7828125	-18.7828125	0	0	0
266	Wekiva Springs (Levy)	-62.83770833	-62.83755787	0.000150463	-0.000239447	0.000317075
267	Wilson Spring (Columbia)	-32.18851852	-32.18847222	4.63E-05	-0.000143829	9.76E-05
268	Walker Spring (Jefferson)	-2.040798611	-2.040798611	0	0	0
269	Worthington Spring	0	0	0	-1.23E+30	0
270	Citrus Blue Spring	-15.51866898	-15.51865741	1.16E-05	-7.46E-05	2.44E-05
271	Alexander Spring	-114.0564236	-114.0564236	0	0	0
272	Rainbow Spring #1	-652.9836806	-652.9829861	0.000694444	-0.000106349	0.001463421
273	Deleon Spring (Volusia)	-5.19494213	-5.19494213	0	0	0
274	Fern Hammock Springs	-11.065	-11.06498843	1.16E-05	-0.000104601	2.44E-05
275	Turtle Nook Spring	-705.3793981	-705.3784722	0.000925926	-0.000131266	0.001951228
276	Sweetwater Springs	-9.380520833	-9.380474537	4.63E-05	-0.000493537	9.76E-05
277	Silver Glen Springs	-106.8372917	-106.8364931	0.000798611	-0.000747502	0.001682934
278	Salt Springs (Marion)	-77.55373843	-77.5471875	0.006550926	-0.008446951	0.013804937
279	Wells Landing Spring	-10.0019213	-10.00094907	0.000972222	-0.009720355	0.002048789
280	Tobacco Patch Landing Spring	-9.886157407	-9.885914352	0.000243056	-0.002458544	0.000512197
281	Croaker Hole Spring	-73.82912037	-73.81991898	0.009201389	-0.012463089	0.019390327
282	Beecher Spring	-3.883819444	-3.882314815	0.00150463	-0.038740978	0.003170745
283	Mud Spring (Putnam)	-1.713009259	-1.712430556	0.000578704	-0.033782871	0.001219517
284	Welaka Spring	-7.342476852	-7.339756944	0.002719907	-0.037043459	0.005731732
285	Camp Seminole Springs	-1.735613426	-1.735462963	0.000150463	-0.008669152	0.000317075
286	Orange Spring (Marion)	-4.056921296	-4.056736111	0.000185185	-0.004564673	0.000390246

Table 6.3.2-1. Summary of Base and Projected Outflow Conditions from Rivers and Springs in SRWMD Resulting from Proposed Withdrawal at the SECI Property (Continued, Page 11 of 11)

				Predicted Change in Flow		
Station Number	River Station Name	Base Condition Outflow (cfs)	Simulated Outflow with Consumptive Use (cfs)	cfs	%	As Fraction of Consumptive Use Permit
287	Marion Blue Spring	-1.15653125	-1.156320602	0.000210648	-0.018213788	0.000443904
288	Green Cove Springs	-5.545671296	-5.541701389	0.003969907	-0.071585696	0.00836589
289	Shepherd Spring	-1.228912037	-1.228912037	0	0	0
290	Gander Spring	-0.801398148	-0.801398148	0	0	0
291	Newport Spring	0	0	0	-1.23E+30	0
292	Wakulla Spring	-668.5747685	-668.5747685	0	0	0
293	St Marks River Rise (Leon)	-200.4197917	-200.4197917	0	0	0
294	Natural Bridge Spring (Leon)	-151.7730324	-151.7730324	0	0	0
296	Horn Spring	0	0	0	-1.23E+30	0
297	Chicken Branch Spring	0	0	0	-1.23E+30	0

Source: ECT, 2017.

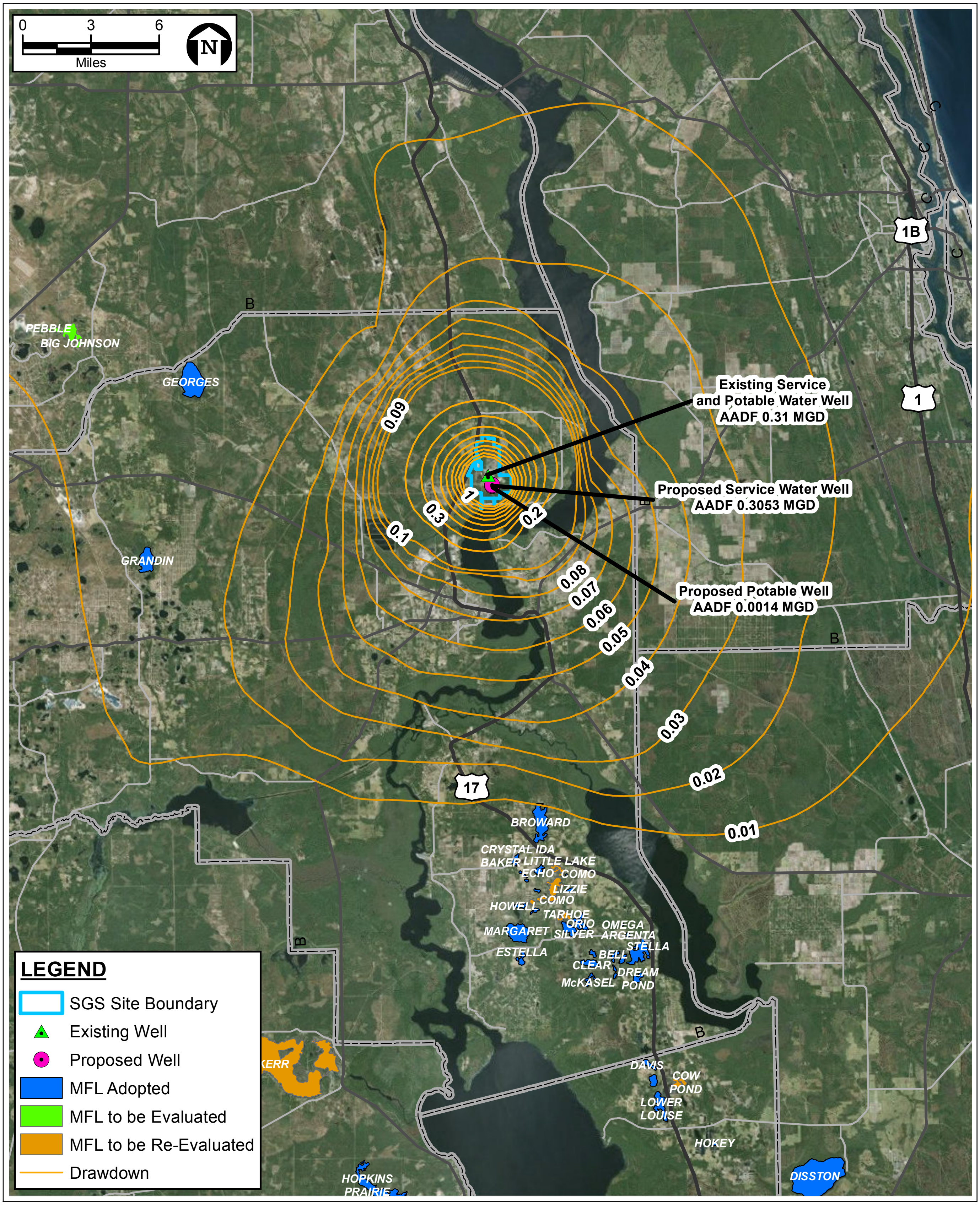

FIGURE 6.3.2-3.
UPPER FLORIDAN AQUIFER DRAWDOWN ANALYSIS FOR SJRWMD LAKES WITH MFLs

Sources: SJRWMD, 2016; USDA, 2015; ECT, 2017.

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6.3.2.2 Potential Surficial Aquifer Impacts

SECI used SJRWMD's northeast Florida regional groundwater model to evaluate the effects of the proposed consumptive use impacts on the surficial aquifer resulting from the proposed withdrawal for SCCF. As previously described, Groundwater Vistas was used to simulate the proposed pumping rate from the Upper Floridan aquifer for the Remaining SGS Unit combined with SCCF.

The modeling results indicate a drawdown of less than 0.002′ within the surficial water table and the wetland areas on the SGS property and surrounding area resulting from the proposed withdrawals (see Figure 6.3.2-4). Based on these results, potential impacts of SCCF, combined with the Remaining SGS Unit approved withdrawals, are expected to be minimal.

6.3.3 Drinking Water

Drinking water to support SCCF will be obtained from a new potable water well drawing from the Upper Floridan aquifer and installed in the water treatment and storage tank area east of the SCCF power block area. The potable water supply demand is anticipated to be 1,440 gallons per day or 0.00144 MGD. The groundwater will be treated in a new potable water treatment system.

There are no discharges proposed to drinking water sources as part of SCCF. As a result, the proposed Project is not expected to impact the drinking water supply wells either on-site or in the site vicinity.

6.3.4 Leachate and Runoff

Contact process waters and stormwater runoff, such as wastewater from containment areas, floor drains, and equipment drains, will be treated/routed through an oil/water separator and discharged via Outfall D-001 to the St. Johns River. Other, low-volume wastewaters will also be routed to the wastewater collection sump and then offsite through Outfall D-001. Therefore, the Project will have no impacts from leachate and runoff.

6.3.5 Measurement Programs

SGS currently has a groundwater monitoring, operation, and measurement program in place for the Existing SGS Units. No landfill or land disposal operations are anticipated as part of SCCF. Therefore, it is anticipated the measurement program required by the existing COCs will continue, and SCCF may be required to follow a similar monitoring and measurement program.

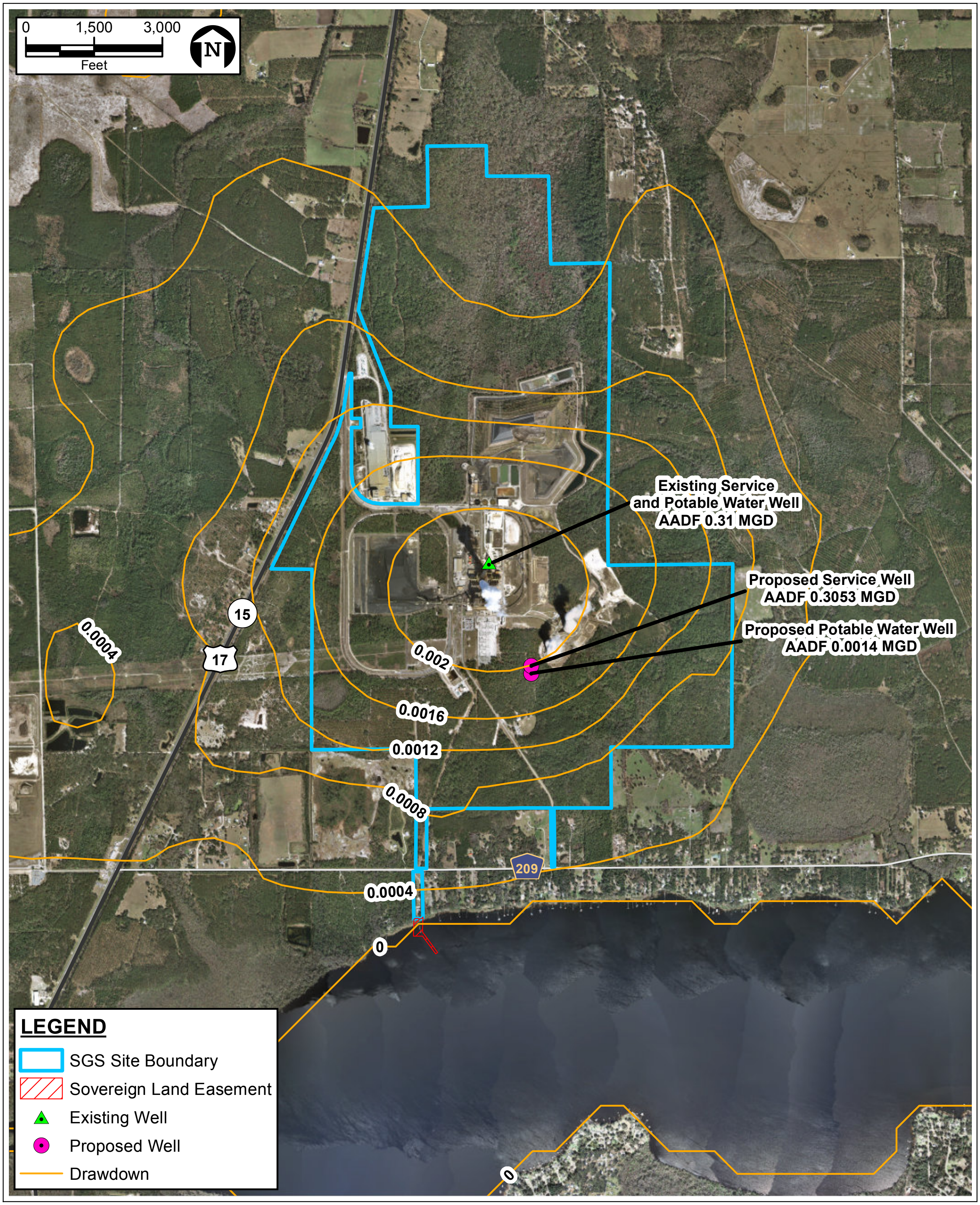

FIGURE 6.3.2-4.

SURFICIAL AQUIFER DRAWDOWN ANALYSIS

Sources: SJRWMD, 2016; FDOT, 2017; ECT, 2017.

Seminole Electric COOPERATIVE, INC.

6.4 Solid/Hazardous Waste Disposal Impacts

6.4.1 Solid Waste

Section 4.7.1 describes the types of non-hazardous solid waste that will be produced by SCCF operations. These wastes primarily consist of office wastes, used air inlet filters, used oil and lubricants, and other similar maintenance wastes. These wastes will be collected, temporarily stored, and transported off-site by a licensed transporter for disposal at an appropriately permitted solid waste management facility. Solid wastes from SCCF operations will not be disposed onsite. Therefore, SCCF operations are not expected to have adverse impacts related to solid waste.

6.4.2 Hazardous Waste

As described in Section 4.7.2, SCCF will occasionally generate small quantities of potentially hazardous waste during operations and maintenance activities. These wastes will generally include laboratory chemicals, solvents, paints, and cleaning fluids. To the extent practicable, SECI will select materials that generate only non-hazardous waste. The potentially hazardous waste will be collected, managed, and temporarily stored in a designated hazardous waste storage area(s) and periodically transported offsite by a licensed hazardous waste transporter for disposal at an appropriately permitted hazardous waste management facility. Hazardous waste will be managed, reported, and documented in accordance with applicable hazardous waste management regulation requirements. Project operations will have no adverse impacts due to hazardous waste.

6.5 Sanitary and Other Waste Discharges

A regional sanitary wastewater system is not available in the area of the SGS site. As described in Section 4.5.2, sanitary wastewaters generated by employees and visitors during operations will be disposed through the use of an onsite package treatment plant. The package treatment plant will be designed, sized, and sited to handle wastewater flows generated by the approximately 30 operational employees in accordance with all applicable nonprocedural requirements. The treated sanitary wastewater will be routed to the onsite wastewater collection sump and discharged along with the cooling water blowdown and other treated wastewater to the St. Johns River. No adverse impacts are expected due to sanitary wastewater disposal during Project operations.

6.6 Air Quality Impacts

6.6.1 Impact Assessment

6.6.1.1 Introduction

Air quality impact analyses, or air dispersion modeling analyses, are required for most PSD pollutants subject to PSD applicability and review. PSD regulations do not require air quality impact analyses for VOC emissions. Since SCCF will be subject to PSD applicability for VOC emissions only, air quality impact analyses are not required.

6.6.1.2 Regulatory Applicability

Under federal PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and approved by EPA or by the state agency if PSD review authority has been delegated. A *major stationary source* is defined as any one of 28 named source categories that have the potential to emit 100 tpy or more, or any other stationary source that has the potential to emit 250 tpy or more, of any pollutant regulated under the CAA. *Potential to emit* means the capability at maximum design capacity to emit a pollutant after the application of control equipment. The Existing SGS Units collectively comprise a major stationary source since the site is among the 28 named source categories and has the potential to emit 100 tpy of at least one regulated pollutant.

SCCF constitutes a major modification to an existing major stationary source, since SCCF will have a net emissions increase greater than one or more of the PSD SERs listed in Rule 62-210.200(256), F.A.C. *Net emissions increase* means the increase in emissions from a particular physical change or change in operation and any increases and decreases in actual emissions that are contemporaneous with the particular change and are creditable. Therefore, the Project must undergo PSD review for those pollutants that exceed the PSD SER. Table 6.6.1-1 summarizes SCCF net emissions increases and compares them to the SER thresholds for PSD applicability. Project net emissions increases shown in Table 6.6.1-1 were calculated in accordance with Rule 62-210.200(187), F.A.C., definition of “Net Emissions Increase.”

As shown in Table 6.6.1-1, SCCF will trigger PSD review for VOC emissions only. PSD review is used to determine whether significant air quality deterioration will result from a new or modified source. Florida PSD review requirements are contained in Chapter 212.400, F.A.C., Prevention of Significant

Table 6.6.1-1. Project Net Emissions Change Compared to PSD SERs

Pollutant	Project Net Emissions Change* (tpy)	PSD SER (tpy)	PSD Applicability
CO	-656	100	No
NO_x	-261	40	No
SO_2	-4,544	40	No
PM (filterable)	-119	25	No
PM_{10} (filterable and condensable)	-518	15	No
$PM_{2.5}$ (filterable and condensable)	-518	10	No
Ozone (as VOC)	75	40	Yes
Lead	Negligible	0.6	No
Total fluorides	Not applicable	3	No
H_2SO_4 mist	-55	7	No
GHG (as CO_2e)	-165,053	75,000	No
Hydrogen sulfide (H_2S)	Not present	10	No
Total reduced sulfur (including H_2S)	Not Present	10	No
Reduced sulfur compounds (including H_2S)	Not present	10	No
Municipal waste combustor organics (measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans)	Not present	3.5 $E10^{-6}$	No
Municipal waste combustor metals (measured as PM)	Not present	15	No
Municipal waste combustor acid gases (measured as SO_2 and hydrogen sulfide)	Not present	40	No
Municipal solid waste landfill emissions (measures as nonmethane organic compounds)	Not Present	50	No
Mercury	Negligible	0.1	No
For the pollutants listed above, and for major stationary sources locating within 10 km of a Class I area having an impact equal to or greater than 1 microgram per cubic meter, 24-hour average.	Not applicable	Any amount	No

*Net emissions change represents the highest emissions increase or least emissions decrease based on offsetting potential emissions from SCCF with the removal from service of either Existing SGS Unit 1 or 2.

Sources: Rule 62-210.200(187), F.A.C.
Black &Veatch, 2017.
SECI, 2017.
ECT, 2017.

Deterioration. Major sources may be required to undergo the following reviews related to PSD for each pollutant emitted in significant amounts:

- Control technology review.
- Air quality analysis (monitoring).
- Source impact analysis.
- Source information.
- Additional impact analyses.

The control technology review includes determination of BACT for each applicable pollutant. BACT emissions limits cannot exceed applicable emissions standards (e.g., NSPS or National Emissions Standards for Hazardous Air Pollutants [NESHAP]). The air quality analysis (monitoring) portion of PSD review typically does not require preconstruction ambient air monitoring data to be collected in the impact area of the proposed source. Air quality monitoring data from existing state air monitors can be used to assess the air quality in the area.

6.6.1.3 Other Air Quality-Related Impacts Due to Associated Growth

It is anticipated SCCF will require approximately 30 full-time operational employees. When combined with the removal from service of one of the Existing SGS Units, no measurable growth in population or any associated air quality impacts are expected to result from SCCF operations.

Visibility impairment at the local level is not expected from the Project. Given the permanent removal from service of either Existing SGS Unit 1 or 2, net emissions of PM and sulfur oxides will decrease. The relatively small potential increase in VOC emissions are not expected to affect local visibility.

Certain air pollutants in acute concentrations or chronic exposures can impact soils, vegetation, or wildlife resources. No such adverse impacts are expected to result from the Project in combination with the removal of service of an Existing SGS Unit.

Soil impacts can result from SO_2 and NO_x deposition creating an acidic reaction or lowering soil pH. In this case, SCCF SO_2 and NO_x emissions will decrease based on the operation of SCCF and the permanent removal from service of an Existing SGS Unit.

Vegetation can be affected by acute exposures to high concentrations of pollutants, resulting in foliar damage. Lower dose exposure over longer periods of time (chronic exposure) can affect physiological processes within plants causing internal and external damage. With the exception of VOC, emissions from all other pollutants will decrease with the operation of SCCF and the permanent removal from service of an Existing SGS Unit. Any impacts from the relatively small potential increase in VOC emissions will be negligible.

Releases of air pollutants can also affect wildlife through inhalation, exposure through skin, or ingestion. However, based on comparatively low emissions levels and resulting insignificant Project impacts, natural dispersion of emissions, and mobility of wildlife, no adverse impacts to regional wildlife resources are expected. Again, overall, with the exception of VOC, the Project will result in significant net emissions decreases for other pollutants.

SCCF CTGs will be subject to NSPS Subparts KKKK (Stationary Combustion Turbines) and TTTT (Greenhouse Gas Emissions for Electric Generating Units). The emergency fire water pump engine will be subject to NSPS Subpart IIII (Stationary Compression Ignition Internal Compression Engines) and NESHAP Subpart ZZZZ (Stationary Reciprocating Internal Combustion Engines). The fuel heaters will be subject to NESHAP DDDDD (Boilers and Process Heaters). Emissions monitoring will be performed as required by each of these NSPS and NESHAP.

Project CTGs are also subject to the requirements of EPA's Acid Rain Program and Mandatory GHG Reporting Rule. Monitoring and reporting of emissions will be conducted in accordance with the requirements of these federal programs.

6.7 Noise

During operation of SCCF, the primary continuous sources of noise will include noise emanating from the gas turbine generators, HRSGs, the STG, cooling towers, and rotating equipment, such as pumps and fans. Intermittent noise will also be produced from operation of the emergency fire water pump for maintenance and testing purposes and steam vents and relief valves during startups and trips. Operation of SCCF and the Remaining SGS Unit will not have adverse noise impacts.

Putnam County's noise standards[2] apply only to "amplified sound," which is "any noise or sound that is artificially enhanced or increased in volume by means of amplifier, speaker, tape or disc player, radio, or any other mechanical or electronic device."[3] Noise produced by SCCF will not be amplified sound; therefore, the Putnam County noise standards are not directly applicable to the Project, and the Putnam County noise limits are discussed for informational comparison purposes only.

[2] Article VII, Chapter 18, Putnam County Code,
[3] § 18-199, Putnam County Code.

Under Putnam County standards, the maximum permissible sound levels are specified by the day/time and the sensitivity of the property experiencing the noise disturbance. Table 6.7.0-1 provides a summary of the maximum allowable amplified sound levels.

Table 6.7.0-1. Maximum Allowable Amplified Sound Limits

Property Experiencing Noise Disturbance	Day of Week/Time of Day	Sound Level Limit, L_{eq} (dB)	
Noise sensitive	All day/any time	65 (A-wt)	70 (C-wt)
All others	Sunday-Thursday/8:01 a.m. – 10 p.m.	70 (A-wt)	75 (C-wt)
	Sunday-Thursday/10:01 p.m. – 8 am	65 (A-wt)	70 (C-wt)
	Friday-Saturday/8:01 a.m. – 11:30 p.m.	75 (A-wt)	80 (C-wt)
	Friday-Saturday/11:31 p.m. – 8 a.m.	65 (A-wt)	70 (C-wt)

Source: Putnam County Code of Ordinances, Chapter 18, Article VII, Section 18-201, amended March 8, 2016.

Noise sensitive use means hospitals, nursing homes, schools, courts of law, or other areas designated by resolution of the Board of County Commissioners. There are no noise sensitive properties in the immediate vicinity of SGS; therefore, if applicable, the maximum permissible sound levels would be 65 dBA during the nighttime and either 70 or 75 dBA during the daytime.

To assess noise impacts from SCCF operations, a noise modeling analysis was performed to predict the noise levels from SCCF operations at the SGS property line (see Appendix 10.7.3). These predicted noise levels from SCCF operations were combined with noise levels measured during operation of the existing SGS facilities to show the noise from both the Existing SGS Units and proposed SCCF operations would meet Putnam County's noise ordinance requirements if it was applicable to the Project. The following subsections describe the noise model used, noise modeling inputs, and results.

6.7.1 Noise Model

The noise model used was Computer-Aided Noise Abatement (CadnaA), Version 4.6, developed by DataKustik, Greifenberg, Germany. This is state-of-the-art noise prediction software for outdoor noise sources based on International Organization for Standardization (ISO) Standard 9613, Parts 1 and 2. ISO 9613-1 relates to atmospheric attenuation, while ISO 9613-2 specifies an engineering method for calculating environmental noise from a variety of noise sources by accounting for various attenuation effects observed during outdoor sound propagation. ISO 9613-2 conservatively uses meteorological conditions favorable to sound propagation; i.e., downwind propagation with wind velocities between 1 and 5 meters per second.

6.7.2 Noise Model Inputs

6.7.2.1 Noise Source Data

The SCCF layout was imported into CadnaA to accurately locate the major noise sources and noise receptors. Most noise sources were input as point sources, meaning the noise emanating from these sources will radiate from a single point in all directions from grade level. Noise sources input as point sources include the gas turbine train, HRSGs and stacks, inlet ducts and filters, vent fans, STG train, and cooling tower. The gas turbine train includes the turbine compartment, inlet plenum, lubricating oil module, exhaust diffuser, load compartment, and generator. The STG train includes the turbine, lubricating oil module, condenser, condenser vent, and generator. Sources located at grade were assigned a source height of 1.5 meters (5′), while source height for noise emanating from the main stacks was assigned a source height equal to the stack height of 199′. The cooling tower sources were placed at each fan with a height of approximately 60′. The exhaust stacks and cooling tower cells were input as point sources with 90-degree directivity.

Sound power level data for the noise sources were obtained from the equipment manufacturers and typical equipment sound power levels. Table 6.7.2-1 presents a summary of the noise sources used in this noise analysis and their respective sound power levels.

Several noise sources used in the noise analysis may not operate continuously through the entire 24-hour day but were conservatively analyzed as if they will be continuously operating. Intermittent noise sources that operate infrequently were not included in the noise analysis.

Figure 6.7.2-1 presents a graphical representation of the noise source locations.

Table 6.7.2-1. Sources and Sound Power Levels Used in Noise Modeling Analysis

Quantity	Source Description	Sound Power Level (dB) at Octave Band Center Frequency (Hz) 31.5	63	125	250	500	1,000	2,000	4,000	8,000	A-weighted Sound Power Level (dBA)
2	7HA.02 inlet ducting	110	100	93	84	82	83	99	98	76	103
2	7HA.02 inlet filter face	112	105	101	94	90	91	96	104	95	106
2	7HA.02 lubricating oil module	101	102	99	98	97	96	96	97	88	103
2	7HA.02 inlet plenum	102	99	98	93	94	97	97	94	89	102
2	7HA.02 turbine compartment	106	103	101	95	96	97	100	106	94	109
2	7HA.02 exhaust diffuser	107	114	98	94	88	85	87	89	76	95
2	7HA.02 load compartment	87	93	93	87	87	93	94	88	78	98
2	7HA.02 generator	99	105	107	96	102	100	100	94	84	106
1	ST and appurtenances	N/A	107	114	112	109	109	106	103	100	114
1	ST generator	99	105	107	96	102	100	100	94	84	106
1	ST lubricating oil/hydraulic module	98	109	107	106	102	97	91	79	69	103
1	ST gland steam condenser vent	75	91	86	92	99	92	83	85	78	98
1	ST gland steam condenser	87	93	92	92	92	88	84	83	77	94
2	Turbine compartment vent fans	102	102	110	101	98	95	94	98	95	104
2	HRSG (inlet, body and breakout)	115	119	118	108	94	92	85	68	51	105
2	Accessories (piping, valves, and continuous vents)	106	110	109	103	94	90	78	69	62	99
2	Stack exit (90° directivity)	111	118	117	108	93	90	75	66	59	104
16	Cooling tower (90°directivity)	119.5	119.5	119.5	115.6	112.7	109.8	102.3	98.2	94.2	114.7

Sources: GE, 2016.
SECI, 2016.
ECT, 2016.

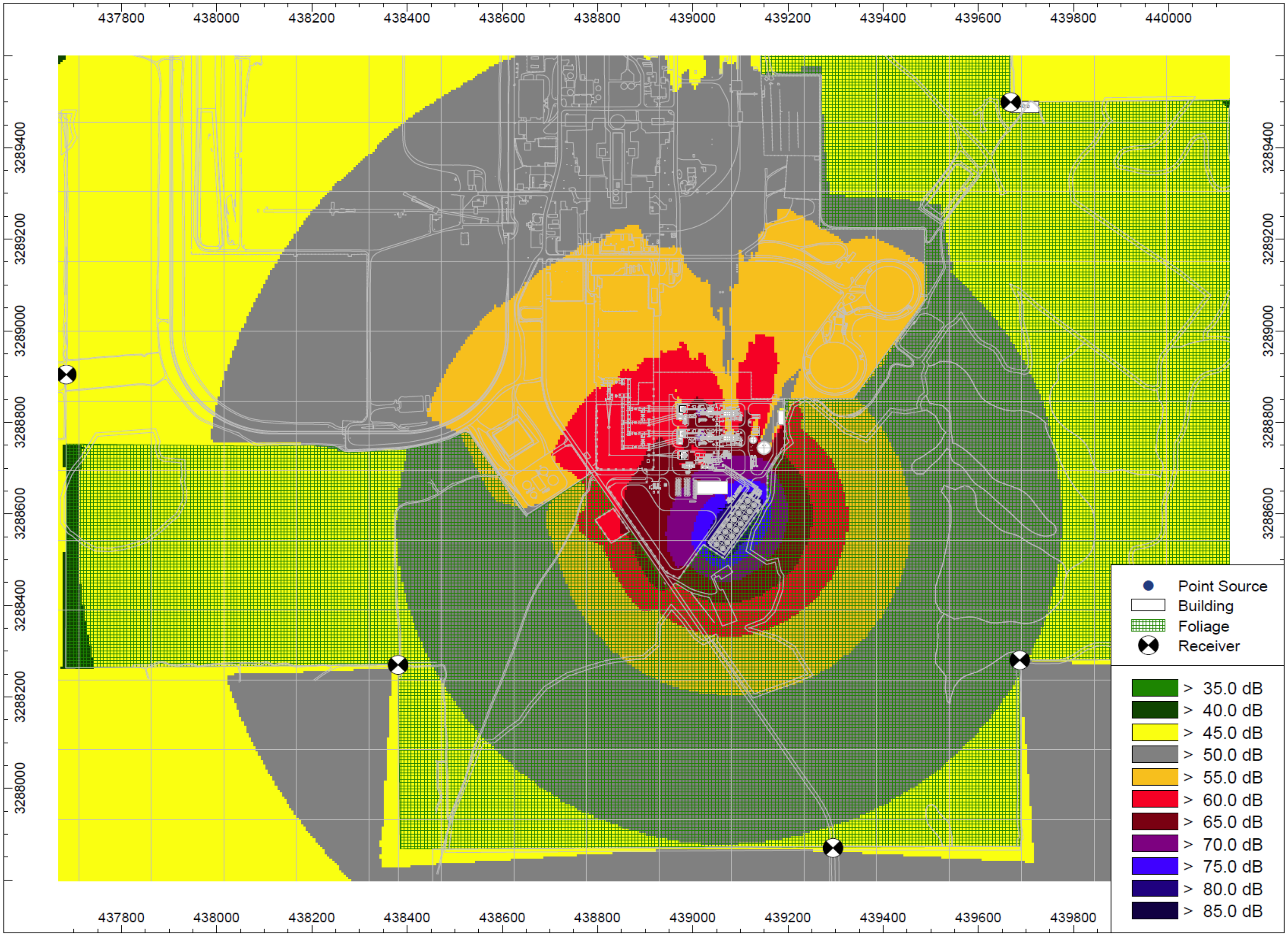

FIGURE 6.7.2-1.

NOISE SOURCE LOCATIONS

Sources: ECT, 2017.

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6.7.2.2 Attenuation Data

CadnaA calculates sound pressure levels (SPLs) based on attenuating factors from geometrical divergence, atmospheric absorption, ground effects, screening, and miscellaneous factors, such as industrial sites and foliage. The major attenuating factor in this modeling study is due to geometric divergence; i.e., the reduction in SPLs due to distance from the noise receptor to the noise source. Trees and foliage were accounted for, based on current foliage on the SGS site, with a maximum 50′ tree height. Atmospheric absorption was based on default values of 10 degrees Celsius (50°F) ambient temperature, 70-percent relative humidity, and porous soil conditions.

6.7.2.3 Noise Receptors

Noise receptors were placed in five locations along the SGS property boundary, as shown on Figure 6.7.2-2. Receptor locations were chosen due to their close proximity to the SCCF power block compared to other points along the property line. These receptor locations are identical to the locations where ambient noise levels were measured with the existing SGS units in operation to aid calculating SCCF noise production (see Table 6.7.2-2). Noise receptors were placed at a height of 1.5 meters, or 5′.

Figure 6.7.2-2 presents a graphical representation of the noise receptor locations.

6.7.3 Noise Results

Table 6.7.2-2 presents the modeled noise levels from SCCF operations, ambient noise prerecorded, and predicted noise levels at the noise receptor locations. These results are very conservative because the measured ambient noise levels included operation of both SGS Units 1 and 2. At the time of SCCF operation, only one of those units will be in operation. The calculated predicted sound levels are a logarithmic summation of the modeling results and the current ambient noise at SGS, as expressed in the following equation for logarithmic summation of SPLs. The maximum predicted noise level along the property line is 54.2 dBA and occurs at the northeast noise receptor during nighttime. If applicable, these conservative predicted noise levels would be below the Putnam County amplified sound level limit of 65 dBA at nighttime.

$$SPL_{Total} = 10\log_{10}\left(\sum_{i=1}^{n} 10^{(SPL_i/10)}\right)$$

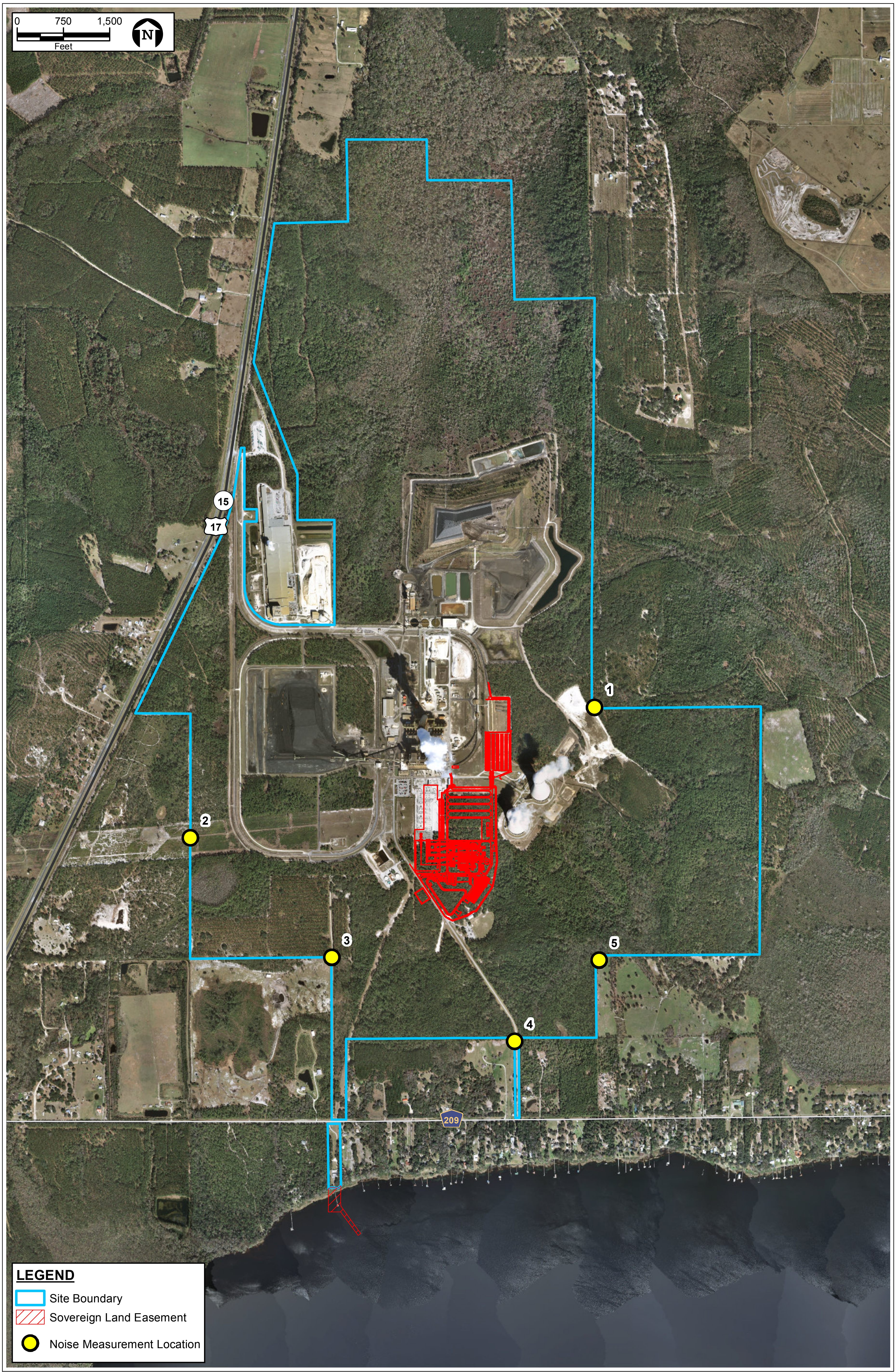

FIGURE 6.7.2-2.

NOISE RECEPTOR SITES

Sources: FDOT, 2017; ECT, 2017.

Seminole Electric COOPERATIVE, INC.

Table 6.7.2-2. Results of Noise Modeling Analysis—SCCF Sources and Units 1 and 2 Anticipated

Noise Receptor Identification and Location	Modeling Result SCCF Only SPL (dBA)	Daytime		Nighttime	
		Recorded Ambient SPL (dBA)	Anticipated SGS SPL (dBA)	Recorded Ambient SPL (dBA)	Anticipated SGS SPL (dBA)
No. 1 – northeast	43.9	53.3	53.8	53.8	54.2
No. 2 – west	47.2	48.9	51.1	41.9	48.3
No. 3 – southwest	45.2	50.5	51.6	45.0	48.1
No. 4 – south entrance	45.5	52.0	52.9	46.3	48.9
No. 5 – southeast	45.8	50.8	52.0	44.6	48.3
Putnam County noise ordinance sound level limit*			65.0		65.0

*Sound level limits are based on the lowest sound level limit of 65 dBA, which represents noise sensitive properties and all other properties during nighttime.

Source: ECT, 2017.

The modeling noise levels from the quantitative noise analysis presented in Table 6.7.2-2 are used to give a portrayal of anticipated SPLs at the SGS site boundaries using the previously described SPL logarithmic summation equation. For example, the ambient noise levels measured at the southeast receptor (No. 2) were approximately 50.8 dBA during daytime hours and 44.6 dBA during nighttime hours. Adding logarithmically the measured ambient noise levels from the Existing SGS Units' operations to the highest modeled noise levels from SCCF operations would result in a maximum daytime noise level of approximately 52 dBA and a maximum nighttime noise level of approximately 48 dBA.

Additionally, the highest ambient noise level measured at any receptor was at the northeast receptor (No. 1), with a daytime noise level of 53.3 dBA and a nighttime noise level of 53.8 dBA. Adding logarithmically the modeling noise level of 43.9 dBA from SCCF operations would result in anticipated SPLs of approximately 54 dBA (daytime and nighttime).

This conservative noise modeling analysis demonstrates that the operation of the proposed Project, in addition to the Existing SGS Units' operations, would meet Putnam County sound level limits for amplified sound, if the ordinance was applicable to the Project. The sound levels associated with SCCF and the Remaining SGS Unit would, therefore, be well below the sound limits.

6.8 Changes in Nonaquatic Species Populations

SCCF operational impacts on wildlife potentially include direct impacts (mortality) and indirect impacts (noise, human presence, air emissions, increased water use, etc.). As stated previously, no significant impacts to on-site or local/regional populations of wildlife are expected from air emissions or cooling system operation. Vehicular traffic on the site may result in some minor mortality from road kills of less motile organisms such as reptiles, amphibians, or small mammals. These impacts are expected to be minor and not noticeably changed from those impacts already occurring from existing vehicular traffic on and around the existing SGS site.

Human presence and noise associated with operating a power plant are impacts already present near the site from existing power plant operations. Current wildlife usage of the site reflects those species are already accustomed to these activities. It is anticipated the relatively minor changes in noise or human presence will not significantly affect wildlife usage of the site.

6.9 Transportation and Other Plant Operation Effects

SECI is committed to ensuring that SCCF operation does not interfere with the safe and efficient flow of traffic on US 17 and CR 209. To that end, a traffic impact analysis report is included in Appendix 10.9 and is summarized here.

The main access to the SGS site is from US 17 (North Access), which is shared with the Continental Building Products adjacent wallboard facility. A secondary access from the south of the SGS site (South Access) is from CR 209 (West River Road). The traffic study evaluated the expected worst-case impacts on the roadways and intersections during plant operation. During the operation phase, the analysis assumes, among other things:

- Declared commercial operation of the SCCF may occur as early as late 2021 but could be 2022. One of the Existing SGS Units will be removed from service in conjunction with declared commercial operation of the SCCF.
- The number of SCCF operation employees will be up to 30. The number of existing SGS employees associated with operation of the two existing coal units is approximately 290. Upon commercial operation of the SCCF and removal from service of one of the coal units, the total workforce on site will decrease by a yet-undetermined number. As a conservative

estimate of total operation workforce, the traffic impact analysis assumes a total of 320 employees onsite during operation of the SCCF.

- During operation of the SCCF, approximately 2 additional large trucks associated with SCCF operation per day are anticipated. All additional large trucks will utilize the North Access.
- Upon commercial operation of SCCF and removal from service of one of the Existing SGS Units, the truck traffic associated with operation of the remaining coal unit will decrease by approximately 50% (from approximately 90 per day to 45 per day). All large trucks will utilize the North Access from US 17.

The traffic analysis concluded:

- All roadway segments are forecast to operate at acceptable LOS conditions during operation.
- Intersection operations are forecast to continue to meet acceptable LOS for all but the US 17 and North Access intersection westbound approach which will experience delay during the PM peak hour during outages.

The traffic analysis recommends:

- Since the delay experience is of a smaller magnitude than during the construction period, this may be mitigated by instructing some employees to use the South Access in place of their regularly used North Access. Alternatively, it is recommended that a police officer directing traffic be considered at the North Access intersection during the PM peak hour during outages until such time as the number of exiting westbound left turns during the Operation Phase PM peak hour is reduced from 335 to 270 (i.e., by 65). It is not recommended that the police officer stop through traffic on US 17.
- Variable messaging signage, or similar signage, on US 17 alerting drivers to conditions ahead.

During outages and the PM peak hour, Seminole will ensure that a police officer is placed at the North Access until such time as the number of exiting westbound left turns is reduced to 270. Seminole also commits to working with state and local agencies to determine appropriate placement of variable messaging signage northbound and southbound on US 17. With these measures, operation-related traffic will not cause adverse impacts to roadways and intersections.

It is possible for vehicles accessing the site to degrade the paving surfaces (e.g., potholes) of those roadways closest to the site. Two factors should minimize such potential degradation. First, heavy power plant components will be primarily delivered via rail. Second, access road improvements were constructed during the initial development of SGS to facilitate construction worker and machinery access to the site. These two factors will minimize such road impacts, especially at the Project entrances. SECI will repair and maintain these entrances as necessary.

6.10 Archaeological Sites

Based on the results of the cultural resources assessment survey and a confirmation letter from FDHR (see Appendix 10.7.2), no archaeological sites are expected to be found on the site. Therefore, no onsite, post-construction monitoring is planned or necessary for SCCF. As previously described in Section 5.9, if encountered, SECI will take appropriate measures to preserve or mitigate potential impacts to archaeological sites after review by a certified archaeologist and consultation with FDHR.

6.11 Resources Committed

The major irreversible and irretrievable commitments of state and local resources due to the operation of the Project are use of land and consumptive use of water. As noted below, the commitments of these resources will be more than offset by environmental benefits resultant from the higher efficiency technology of the Project, all while allowing SECI to continue in providing reliable, cost-effective electricity to its Members.

The proposed permanent use of land (i.e., approximately 32 acres) for Project facilities, while irreversible, will have a minimal impact to Putnam County. The SGS site has been in use for electrical generation for more than three decades. Placement of additional generation near existing generation, combined with utilization of existing transmission and water infrastructure, will minimize impacts to Putnam County. Putnam County recognized as much in approving a comprehensive plan amendment and PUD rezoning for the site to allow SCCF construction on March 14, 2017.

SCCF will use river water for cooling and groundwater for plant service and potable water uses. In the cooling process, some river water is lost through evaporation, but this loss is insignificant compared to the volume of the water source. The river water usage is within the existing SGS withdrawal limits, and the Project will require only a minimal increase in groundwater use. The Project will be designed to minimize the consumptive use of groundwater and recycle water to the extent feasible.

With the exception of potential increases in VOC emissions, air pollutant emissions from SCCF and the Remaining SGS Unit will be reduced from existing conditions and will therefore not impede additional growth in the area. The potential for adverse air quality impacts in the area will be reduced.

References

Coutant, C. 2015. Hydraulic Patterns and Fish Responses Make In-River, Cylindrical Intake Screens Fish Friendly or Why Few Fish??? Prepared for Northwest Energy by Charles Coutant for presentation at EPRI conference: Clean Water Act 316(b): Conference on Engineering, Engineering, Biological and Economic Challenges of the New Existing Facility Rule. November 10-11.

Fisheries-Independent Monitoring (FIM) Program Staff. 2016. Fisheries Independent Monitoring Program 2015 Annual Data Summary Report. Fish & Wildlife Research Institute (FWRI). In-house Report IHR2016-002.

Florida Fish and Wildlife Conservation Commission (FWC). 2017. Summary of Warm Water Refugia Issues. Available at: http://myfwc.com/wildlifehabitats/managed/manatee/habitat/refugia/. Accessed January 9, 2017.

Leftwich Consulting, Inc. 2017. Traffic Impact Analysis: Seminole Electric Cooperative, Inc., Putnam County, Florida. Orlando, Florida. November.

Seminole Electric Cooperative, Inc. (SECI). 1979. Seminole Plant Units No. 1 and No. 2 316b Study and Report. Tampa, Florida, November 1979.

———. 2006. Seminole Generating Station Unit 3 – PA 78-10A2 Application for Site Certification Responses to Agency Sufficiency Comments—May 15, 2006. Tampa, Florida, June 22, 2006.

Sisson, G., H. Wang, I. Brotman, Y. Li, J. Shen, and A. Kuo. 2010. Assessment of Long-Term Water Quality Impacts of the Craney Island Eastward Expansion, Elizabeth River, Virginia. Estuarine and Coastal Modeling (2009): pp. 389-408.

Smith, T.I.J., E.K. Dingley, and E.E. Marchette. 1980. Induced spawning and culture of Atlantic sturgeon. Progressive Fish Culturist 42:147-151.

Smith, T.I.J., D.E. Marchette, and R.A. Smiley. 1982. Life history, ecology, culture and management of Atlantic sturgeon, *Acipenser oxyrhynchus*, Mitchill, in South Carolina. South Carolina Wildlife Marine Resources Department. Final Report to U.S. Fish and Wildlife Service Project AFS-9. 75 pp.

St. Johns River Water Management District (SJRWMD). 2008. Lower St. Johns River Salinity Regime Assessment: Effects of Upstream Flow Reduction Near Deland. Special Publication SJ2004-SP29. Revised September.

———. 2012. St. Johns River Water Supply Impact Study. Technical Publication SJ2012-1. February 14, 2012

Sucsy P., K. Park, G. Belaineh, E. Carter, D. Christian, M. Cullum, J. Stewart, Y. Zhang. 2011. St. Johns River Water Supply Impact Study: Chapter 6. River Hydrodynamics Results. Prepared for St. Johns River Water Management District.

U.S. Army Corps of Engineers (USACE). 2013. Jacksonville harbor navigation study, Duval County, Florida; Draft integrated general reevaluation report II and supplemental environmental impact statement. May 2013. http://www.saj.usace.army.mil/Portals/44/docs/Planning/EnvironmentalBranch/EnvironmentalDocs/JAXDGRR2_01_DRAFT_GRRII_SEIS.pdf. Accessed October 24, 2016.

U.S. Environmental Protection Agency (EPA). 2001. National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities; Final Rule. Federal Register, Volume 66, Pages 65256 through 65345. December 18.

———. 2014. National Pollutant Discharge Elimination System, Final Regulations to Establish Requirements for Cooling Water Intake Structures at Existing Facilities and Amend Requirements at Phase I Facilities: Final Rule. Federal Register, Volume 79, Pages 48300 through 48439. August 15.

U.S. Geological Survey (USGS). 2011. Potentiometric Surface of the Upper Floridan Aquifer in Florida and Parts of Georgia, South Carolina, and Alabama, May – June 2010. Scientific Investigations Map 3182. By S.L. Kinnaman and J.F. Dixon. https://pubs.usgs.gov/sim/3182/pdf/sim3182.pdf. Accessed February 2017.

U.S. Rural Electrification Administration (REA). 1979. Final Environmental impact statement related to the proposed Seminole Plants units 1 and 2 and associated transmission facilities. USDA-REA (ADM) 79-3-F.

Zeitoun, I.H., J.A. Bulvas, and D.B. Roarabaugh. 1981. Effectiveness of Fine Mesh Cylindrical Wedge-Wire Screens in Reducing Entrainment of Lake Michigan Ichthyoplankton. Canadian Journal of Fisheries and Aquatic Sciences, 38(1): 120-125.