Phase 1: Regional AWS Feasibility – Cedar Key, Bronson, Otter Creek, and Unincorporated Areas in Levy County

Task 2 – Alternatives Development to Address Current and Future Water Supply Needs (Draft)

Prepared for

Suwannee River Water Management District

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Section 1 Water Supply

1.1 Introduction

The Suwannee River Water Management District (SRWMD) is one of five water management districts tasked with four core mission areas: water supply, water quality, flood control/floodplain management, and natural systems. The SRWMD comprises all or portions of 15 counties and encompasses approximately 7,640 square miles. The SRWMD is responsible for managing the needs of both natural systems and water users. To accomplish this, the SRWMD issues water supply permits for water users and develops minimum flows and minimum levels (MFLs) for natural systems within the SRWMD. These efforts are carried out in conjunction with water supply planning to determine where additional water is needed, identify alternative water supplies (AWSs), and implement cost-effective projects to address identified water challenges or shortages.

Within the Waccasassa Basin, the City of Cedar Key, unincorporated Levy County, and the Towns of Otter Creek and Bronson have a variety of water and wastewater challenges that they are attempting to address with assistance from the SRWMD. For both Cedar Key and Otter Creek, these include water quality concerns related to their supply wells and treatment requirements. Additionally, Cedar Key is faced with challenging wastewater treatment issues and loss of treated water to a marine ecosystem where it cannot be beneficially recharged or reused. Bronson and Levy County are concerned with water supply and managing increasing demand in a responsible manner. These disparate challenges present potential opportunities for these entities to collaborate to develop regional projects that can help address these concerns, while also providing a reliable and resilient water supply and employing wastewater treatment and reuse strategies that can benefit the region.

The SRWMD is working with the Florida Department of Environmental Protection (FDEP) and the communities to evaluate this study area and the identified water and wastewater challenges by developing an alternatives analysis for these specific challenges and needs faced by each community. This effort is evaluating not only current needs, but also anticipated growth in the region and potential medium to long-term water supply challenges. The tasks to complete this project include:

- Task 1: Evaluation of current and future water supply challenges, needs, and limitations for Cedar Key, Otter Creek, Bronson, and Unincorporated Levy County.
- Task 2: Alternatives development to address current and future water supply needs.
- Task 3: Evaluation of current and projected wastewater treatment and disposal needs for Cedar Key, Otter Creek, Bronson, and Unincorporated Levy County.
- Task 4: Alternatives development for wastewater reuse and recharge.
- Task 5: Cost estimation and cost-effectiveness calculation for the identified alternatives.

This report is focused on Task 2 of the project and describes the development of alternatives to address current and future water supply needs.

The study area for this project is the portion of the SRWMD that lies within the Waccasassa River Basin and Levy County. The primary focus of this project is the area between the Town of Bronson and the City of Cedar Key along and within the vicinity of State Road 24 (SR24). This includes the Town of Otter Creek and portions of Unincorporated Levy County along and near SR24 including the unincorporated communities of Rosewood and Sumner. The relevant boundaries and study area are shown in Figure 1.

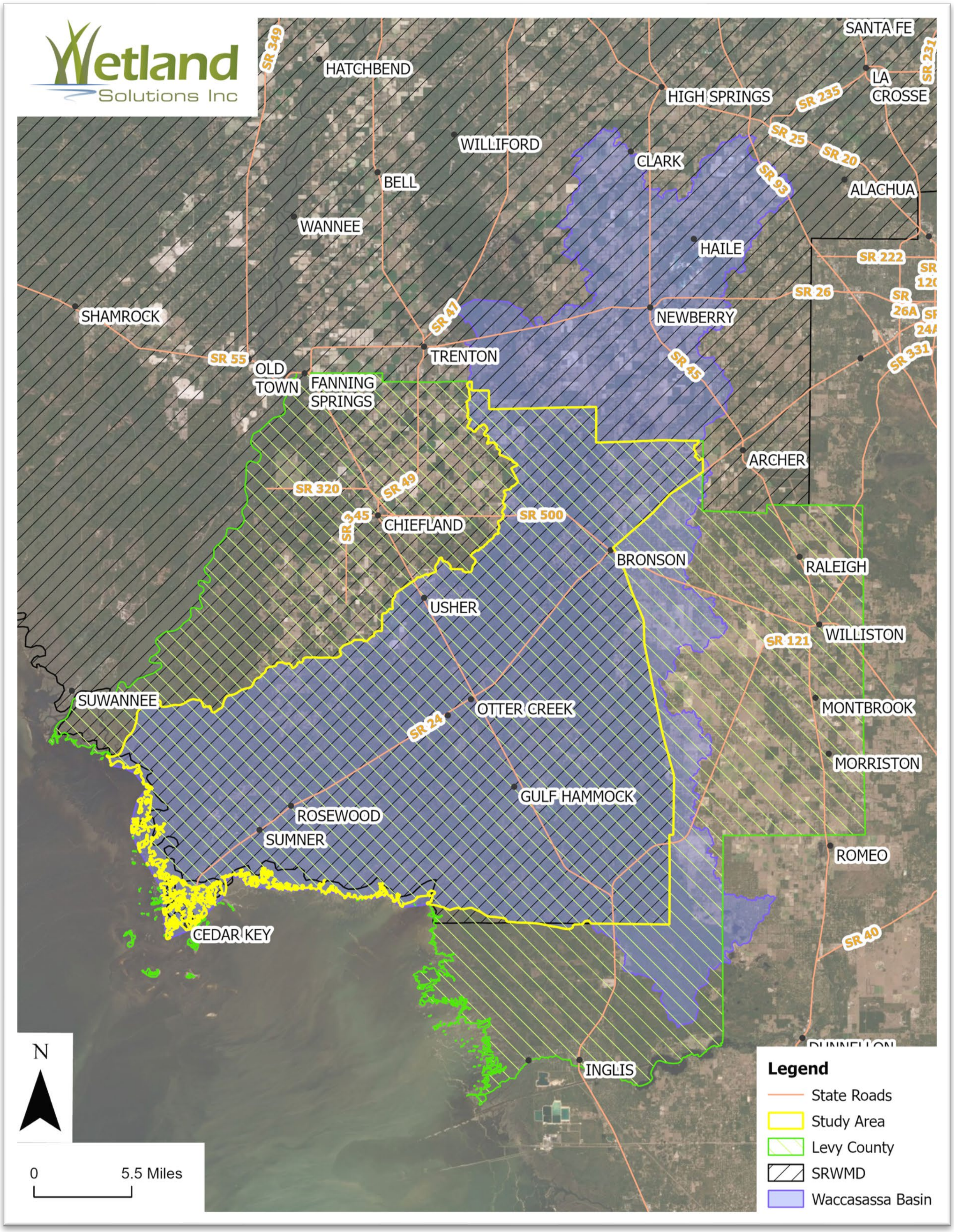

Figure 1. Regional Alternative Water Supply Feasibility Study Area Extents

Section 2 Source Water Alternatives

This study considered potential water sources that might be used to supply the communities of interest. Potential sources include surface water and groundwater. Each of these options was evaluated for feasibility. Given Bronson's current high-quality water supply it is not expected that Bronson would transition off their current groundwater source. For this reason, only Otter Creek and Cedar Key were considered as transitioning to an alternative water source.

2.1 Surface Water

There are two primary potential surface water sources within the vicinity of the study area. These are the Suwannee and Waccasassa Rivers as shown in Figure 2. Both of these rivers have adopted MFLs.

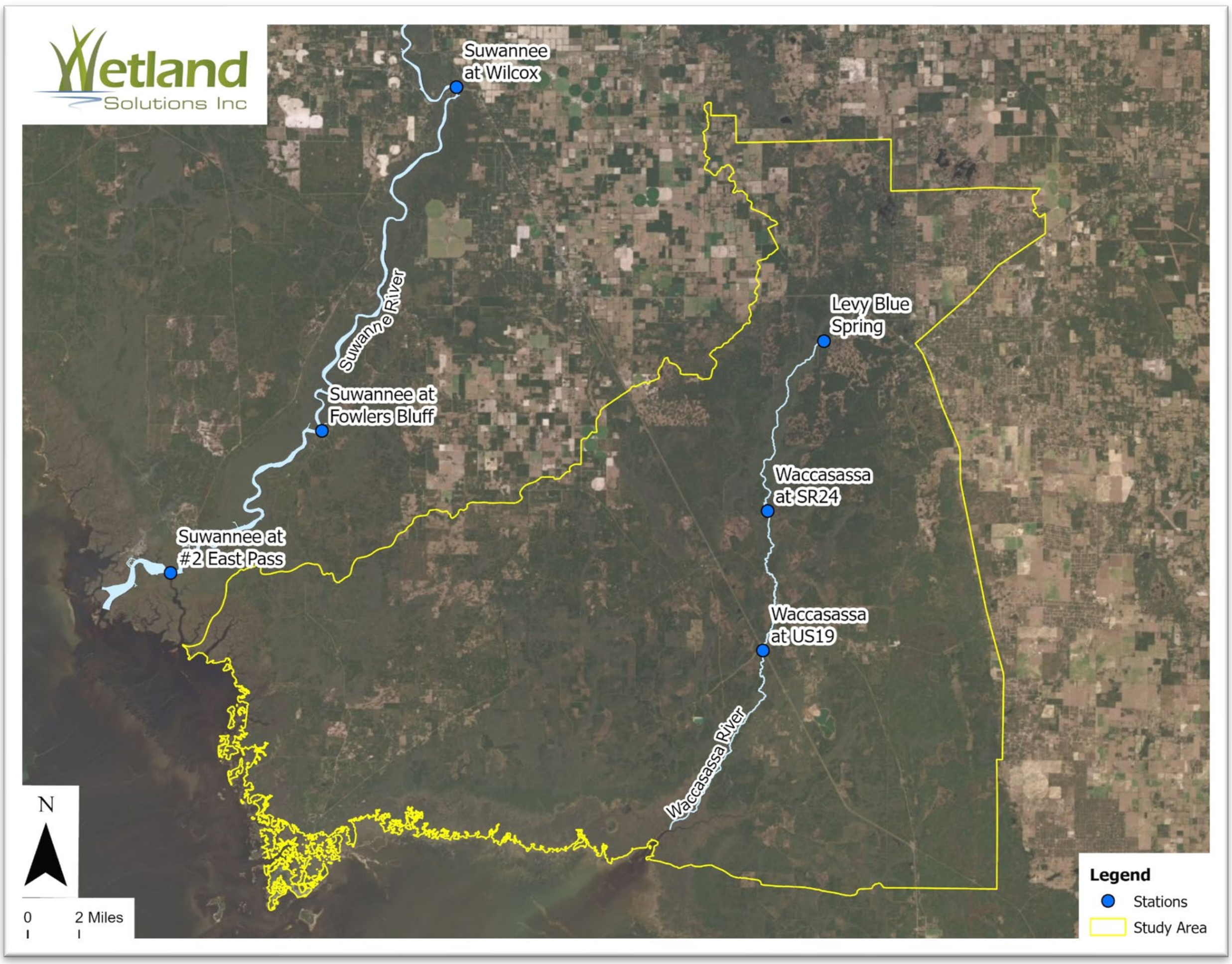

Figure 2. Suwannee and Waccasassa Rivers and Surface Water Stations

2.1.1 Waccasassa River

The Waccasassa River originates at Levy Blue Spring and flows south-southwest before crossing under SR24, approximately 3 miles northeast of Otter Creek. The river then flows south and then southwest to reach the Gulf of Mexico after receiving flows from other tributaries including Otter Creek, Magee Branch, and the Wekiva River.

2.1.1.1 Flows

The Waccasassa River is a spring-fed river with flows dominated by spring flow during dry periods and by runoff during wet periods. Flows at Levy Blue Springs have averaged 10.3 cfs since 2016 with a maximum flow of 18.2 cfs and a minimum flow of 1.38 cfs. Flows were historically collected at the Waccasassa River crossing at SR24 from 1944 to 1953. The minimum flow at this location was 6.7 cfs, with a maximum flow of 1,170 cfs, and a median flow of 50 cfs. Three more recent manual flow measurements from 1995-96 at this location reported an average of 20.5 cfs.

2.1.1.2 Water Quality

The Waccasassa River at SR24 is fed by the combination of spring and wetland flows and is generally a dark-water system due to the influence of the floodplain wetlands present throughout the Devils Hammock Wildlife Management Area and downstream areas. Limited water quality data were available for the Waccasassa River at SR24. However, the SRWMD has a monitoring station on the Waccasassa River at US19 that has been monitored approximately quarterly to monthly since 2006. At this location, data for iron, color (filtered), and total organic carbon (TOC) have been reported consistently since 2014. During this time iron averaged 0.70 mg/L, color averaged 202 PCU, and TOC averaged 21.4 mg/L.

2.1.1.3 Treatment Requirements

The Waccasassa River is generally a tannic river except in the upstream reaches during low-flow periods when Levy Blue Springs flow dominates. These conditions are demonstrated by the color measurements with high values greater than 500 PCU and low values of less than 30 PCU. The water quality of the river is similar in many regards to the current water supplies of Otter Creek and Cedar Key. This finding is consistent with the depth of these communities' groundwater wells and the overlying surface waters that likely infiltrate and feed these wells. Removal of natural color is difficult and requires a multi-step process such as the process currently used by Cedar Key. The cost and challenges associated with treatment are expected to be similar to the communities' current water systems.

2.1.1.4 Regulatory Constraints

The Waccasassa River and Levy Blue Springs had an MFL developed in 2006 and adopted in 2007 (40B-8.051). The adopted MFL for Levy Blue Spring was the surface water flow that would maintain 90% of the historic flow regime. The median flow reported in the MFL study was 6.87 cfs with an MFL median flow of 6.18 cfs. The adopted MFL for the Waccasassa River was the surface water flow that would maintain 87.5% of the historic flow regime. The assessment point for the Waccasassa River was located at the Gulf Hammock Gage downstream of the confluence with US19. The median flow for the Waccasassa River was 157 cfs with an MFL median flow of 137 cfs. The range of flows (5^{th}-95^{th} percentile) was -6 to 875 cfs at this gauge.

The optimum location for a surface water withdrawal to serve Otter Creek and Cedar Key on the Waccasassa River would be in the vicinity of the river crossing at SR24 given the proximity of the river to the locations of interest. Median flows at this location were, based on limited historical data, about 50 cfs. The expected withdrawal need at this location, if taken as the combination of Cedar Key's and Otter Creek's CUPs is 0.468 MGD, or 0.724 cfs. This flow would cause exceedances of the Levy Blue Springs MFL during some low-flow periods although the withdrawal location would be downstream where median flows are higher. It is possible a surface water use permit may be allowed for this location with demonstration of no adverse impacts to the waterbody and MFL.

2.1.1.5 Discussion

Using the Waccasassa River as a water supply is expected to involve a variety of challenges. These include the adopted MFL for the system, variability in flows, and water quality. Based on the flow record at SR24 it appears that there would be times when permitted withdrawals could exceed 10% of the flow at this location. This would likely necessitate a significant volume of storage to accommodate these potential low-flow periods with withdrawals preferentially taken during higher flow periods. The primary concern relative to using this water source for supply is the water quality of the Waccasassa River, which frequently includes high color and TOC concentrations. Both of these parameters are likely to cause treatment challenges and are similar to the current issues that these utilities face with their groundwater supplies. Furthermore, the flashy nature of river flows based on rainfall and runoff are likely to cause significant variability in water quality which could further challenge water treatment. Finally, using this water source would require a pipe between the river and Otter Creek and Cedar Key. This is a long distance without any significant gain in water quality or availability.

2.1.2 Lower Suwannee River

The Lower Suwannee River is located approximately 10-20 miles north of the SR24 corridor near Otter Creek and Cedar Key. The river flows approximately south-southeast before discharging to the Gulf of Mexico at the Town of Suwannee.

2.1.2.1 Flows

The Suwannee River is a substantial river with a watershed starting in southern Georgia and extending to the Gulf of Mexico. The river is fed by stormwater runoff from numerous wetlands as well a substantial baseflow contribution from springs along the river. In the lower reaches the river is tidally-influenced. Suwannee River flows are measured at several locations along the river. In the lower river reaches the gage at Wilcox provides a long-term flow record. At this location flows have averaged 7,730 cfs since 2000, with a range from less than 2,000 cfs to 39,500 cfs.

2.1.2.2 Water Quality

The Lower Suwannee River has had water quality data collected at a wide variety of locations over varying periods of record. For the purposes of this study water quality was considered at

Fowlers Bluff and at the #2 East Pass. The lower river is tidally-influenced and experiences incursions of brackish to salty water during storms or major tidal events. These events are apparent in specific conductance measurements which had a maximum value of 38,500 µS/cm at #2 East Pass and a maximum value of 445 µS/cm at Fowlers Bluff.

Data were also evaluated for color, TOC, and iron since 2014 based on approximately quarterly data. Color averaged 149 PCU at Fowlers Bluff with a range from 11 to 420 PCU. Color at the #2 East Pass station averaged 142 PCU with a range from 13 to 415 PCU. TOC averaged 15.5 mg/L with a range from 2.4 to 34 mg/L at Fowlers Bluff; and averaged 14.4 mg/L at the #2 East Pass station with a range from 2.8 to 34 mg/L. Iron averaged 0.43 mg/L at Fowlers Bluff with a range from 0.07 to 1.0 mg/L; and averaged 0.38 mg/L at #2 East Pass with a range from 0.07 to 1.1 mg/L.

2.1.2.3 Treatment Requirements

The Lower Suwannee River is a tannic river during normal or high flows. This tannin-stained water is demonstrated by the relatively high color values observed in water samples. Additionally, the river generally has high TOC which is also indicative of the wetland contribution to the river system under normal or high-flow conditions. During lower flows the river has a higher percentage of spring flows and TOC and color tend to be lower (Figure 3). As with water in the Waccasassa River these constituents are expected to pose treatment challenges in much same way as the cities’ current groundwater supplies.

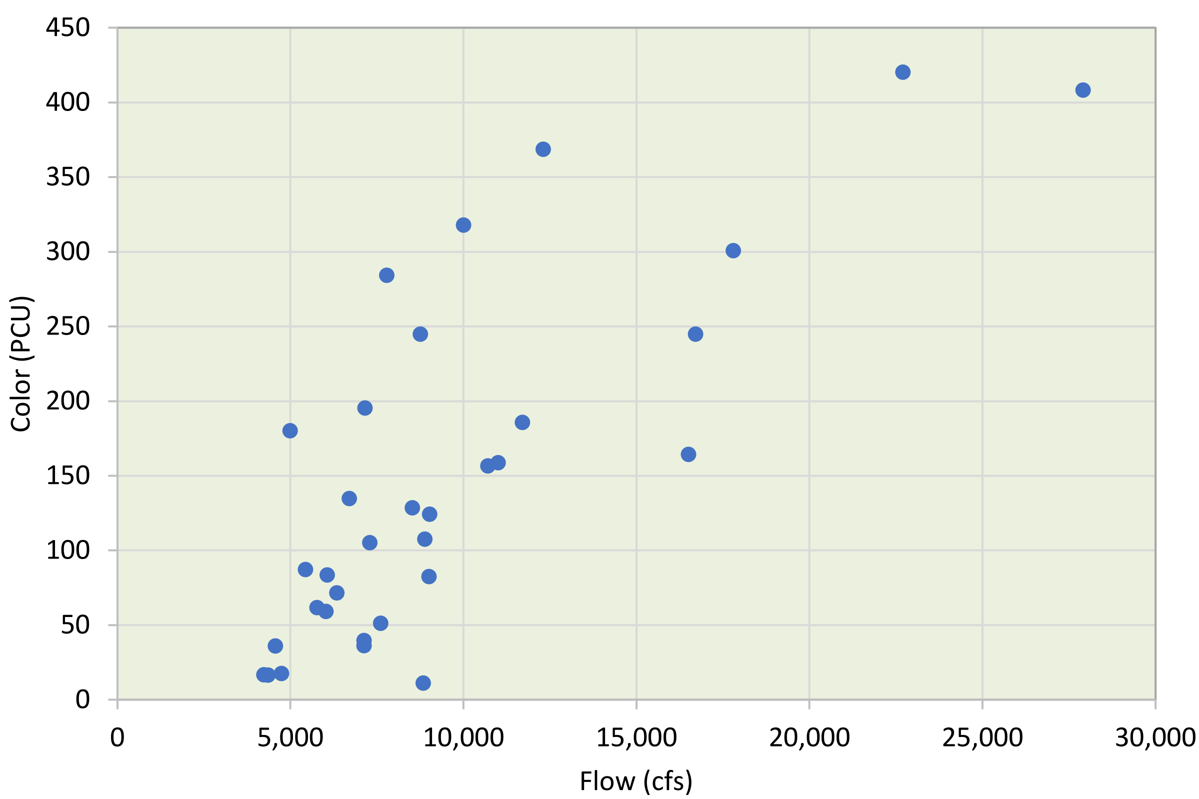

Figure 3. Flow (Suwannee River Near Wilcox; 02323500) Versus Color (Suwannee River at Fowlers Bluff; 02323590)

2.1.2.4 Regulatory Constraints

The Lower Suwannee River, Little Fanning Springs, Fanning Springs, and Manatee Springs had MFLs developed in 2005, with adoption in 2006. The adopted MFLs for the Lower Suwannee River are a median flow of 7,600 cfs between November 1 and April 30 and a median flow of 6,600 cfs between May 1 and October 31 at the Wilcox Gage. In addition, a recommendation was made that the 40B-2 water use permitting Basis of Review be modified to require additional information to ensure withdrawals are not impacting medium or higher flows. Given the flows in the Lower Suwannee River, the 0.724 cfs of withdrawals that would allow complete replacement of the CUPs for both Cedar Key and Otter Creek are a fraction of a percent. However, the median flows in the Lower Suwannee River are highly variable and the median flows have not exceeded the winter and summer targets in numerous years over the past several decades Figure 4.

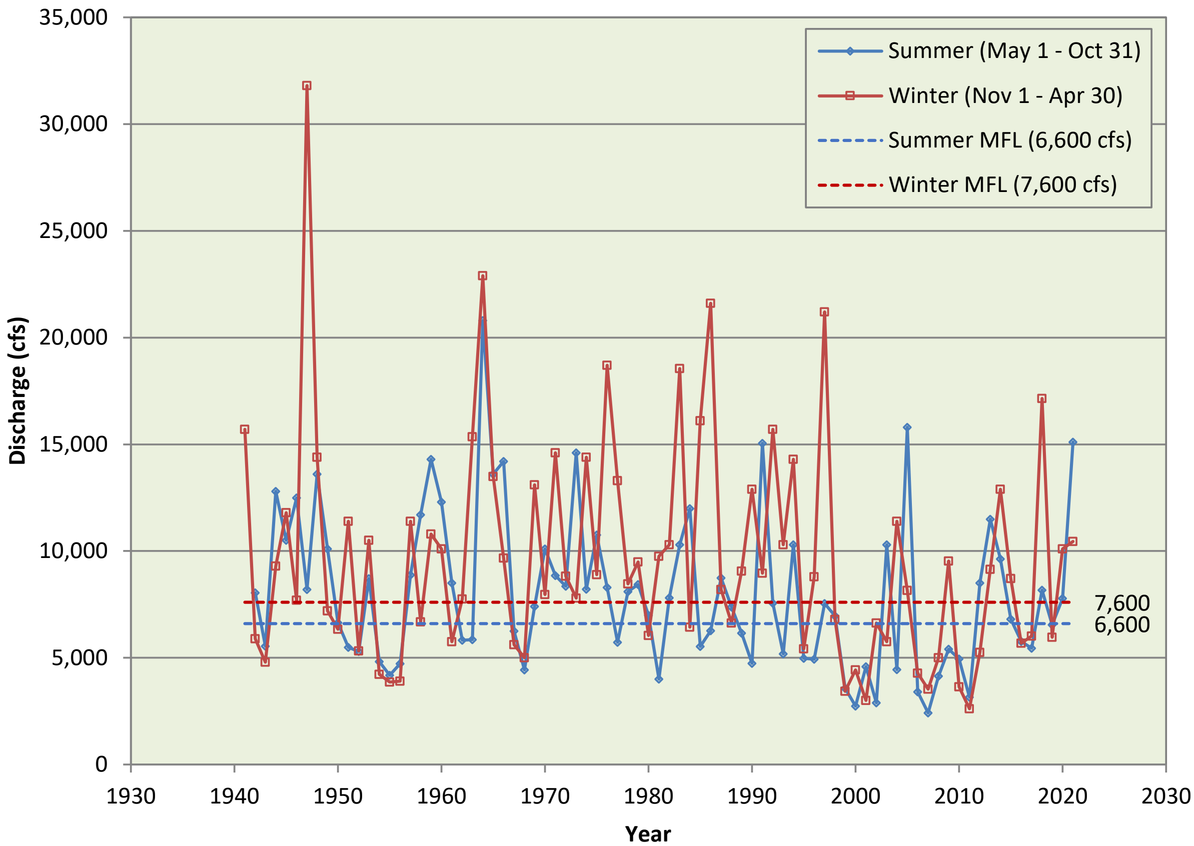

Figure 4. Lower Suwannee River Median Flows and Adopted MFL

2.1.2.5 Discussion

The Lower Suwannee River is expected to be a challenging water source for three key reasons: distance from project area, flows, and water quality. At a distance of about 20 miles to the Suwannee River from Otter Creek the cost to move this water to the project area is expected to be significant and prohibitive. A second challenge to securing a surface water source from the Suwannee River is the interpretation of the current MFL and the availability of water. Finally, the

Suwannee River has significant color and TOC during some periods that is expected to pose many of the same treatment challenges as with the current water sources.

2.1.3 Gulf of Mexico

A final surface water option would be to take brackish or saltwater from the Gulf of Mexico or a tributary to the Gulf. This option is expected to result in substantial costs associated with treatment that are beyond the current level of treatment required from groundwater sources. This option also requires design and construction of a surface water intake structure, conveyance to the treatment facility, and construction of either a surface water discharge pipeline and diffuser or deep injection well for brine concentrate disposal. For these reasons, this alternative did not receive additional consideration.

2.2 Groundwater

The current water supply used by Bronson, Otter Creek, and Cedar Key are Upper Floridan Aquifer wells. In the location where Bronson is located water quality in the UFA is excellent, but wells operated by both Otter Creek and Cedar Key have the issues previously presented. There are two primary aquifers in the project area that may be available as drinking water sources: the UFA and the Lower Floridan Aquifer (LFA). Figure 5 shows a general hydrogeologic cross section of the Floridan aquifer (Williams and Kuniansky 2015). The area of interest for this project lies between FL_DIX4 and P66 at the southern end of the transect. The cross section shows that there is inconsistent confinement between the UFA and LFA and that water quality rapidly degrades with proximity to the coast as evidenced by the shallowing of the 10,000 mg/L TDS concentration threshold. The 10,000 mg/L TDS "line" is referred to as the limit of the Underground Source of Drinking Water (USDW) and represents the poorest quality water that can be used as a raw water source for potable supplies.

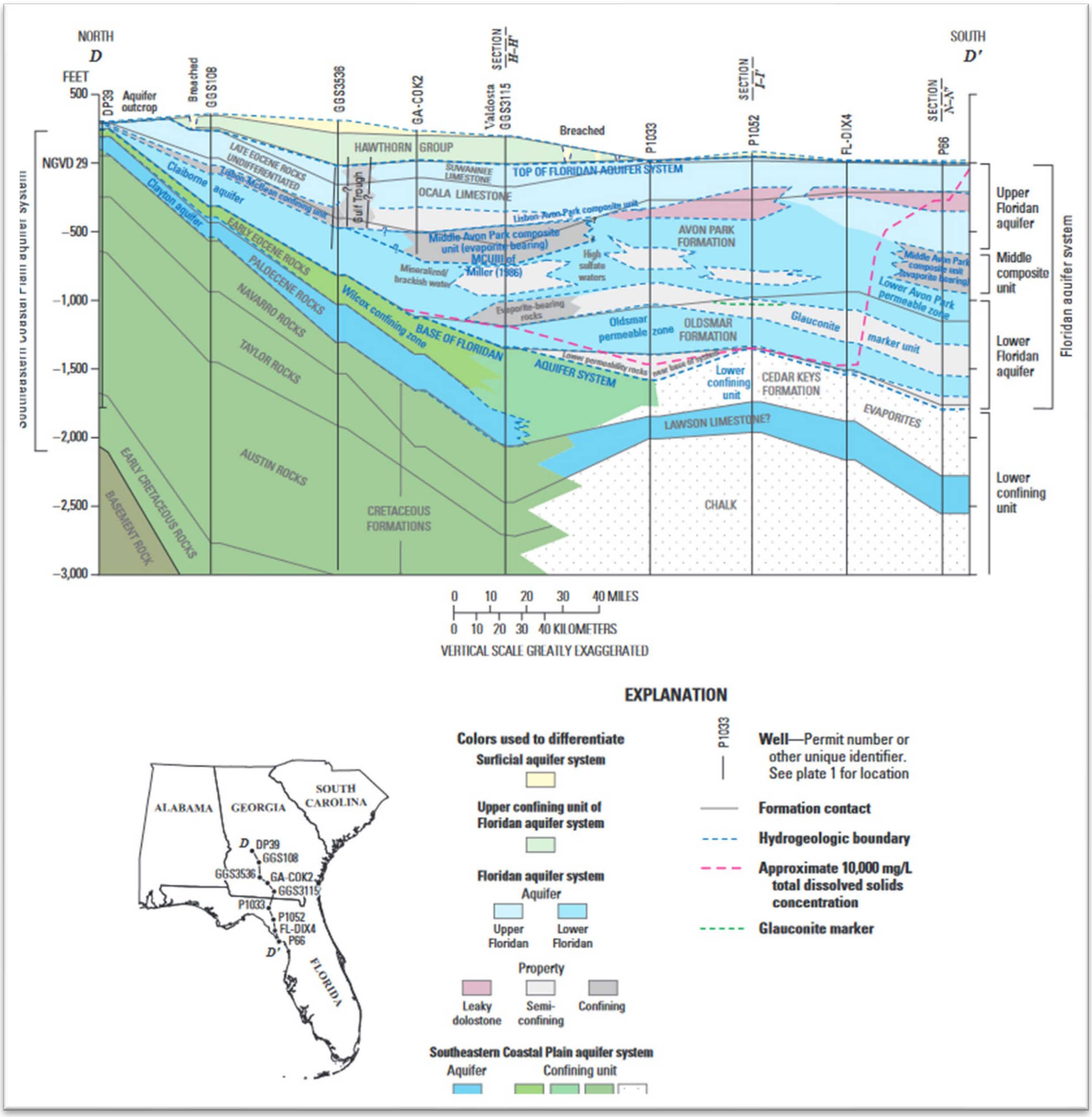

Figure 5. Generalized Hydrogeologic Cross-Section D–D′ from Macon County, GA, to Levy County, FL (Williams and Kuniansky 2015)

2.2.1 Upper Floridan Aquifer

The Upper Floridan Aquifer in the vicinity of the study area provides water of varying quality but is the primary water source for both utilities and domestic self-supply users.

2.2.1.1 Availability

The Floridan Aquifer underlies all of Florida at varying depths, thicknesses, and with varying confinement. The UFA in the vicinity of the project area is unconfined with a depth of approximately 500 feet to the Middle Confining Unit (Miller 1986). The UFA is composed of limestone in the area with generally high transmissivity and easy access for water supply. Typical domestic well depths are between 30 and 100 feet below ground surface in the study area with generally deeper wells to the east toward Bronson.

2.2.1.2 Water Quality and Spatial Variability

Water quality within the UFA is highly variable between Cedar Key and Bronson as previously illustrated by existing water supplies and challenges. Generally, water quality along SR24 is relatively consistent from west to east until reaching Bronson. Water quality in wells west of Bronson is generally marked by higher levels of TOC, color, and iron. These conditions can result in taste, odor, staining, and tooth discoloration. Additionally, given the relatively shallow well depths there is a higher potential for contamination from pathogens. Upon reaching Bronson water quality improves markedly with no parameters of concern except in areas where land use specific activities may cause localized water quality concerns (e.g., nutrients).

Water quality near the coast can also be impacted by saltwater intrusion from the adjacent Gulf of Mexico. This intrusion has been observed directly in Cedar Key's Wells 1, 2, and 3 which were abandoned incrementally due to elevated chloride concentrations and saltwater intrusion. The current supply, Wells 4 and 5 are located east of Wells 1 and 2 and deeper than Well 3.

Water quality data were evaluated for UFA wells monitored by the SRWMD, USGS, and FDEP. Specific parameters of interest included: chloride, color, iron, specific conductance, TDS, and TOC. Average chloride (Figure 6) ranged from 2.31 mg/L to 755 mg/L, with the highest concentration at a well in Rosewood (21FLGW_WQX-50813/21FLSUW_WQX-128724/ S141429001) that is reported to have a total depth of 442 feet. This well was the only well in the database exceeding the secondary drinking water standard (DWS) of 250 mg/L for chloride. Color data were sparser than chloride data with values ranging from 0.325 PCU to 243 PCU (Figure 7). Again, the highest value was measured at the same Rosewood station. Generally, color appeared to increase in UFA water samples from east to west as sandy ridges give way to the lower elevation wet flatwoods. Iron concentrations (Figure 8) ranged from 3 to 14,000 micrograms per liter (µg/L) with a moderate number exceeding the secondary DWS of 300 µg/L. Specific conductance (Figure 9) ranged from 30.2 to 5,748 micromhos per centimeter (µmhos/cm). TDS concentrations (Figure 10) ranged from 15 to 10,200 mg/L, with some sites exceeding the secondary DWS value of 500 mg/L, and the highest value reported near Chiefland. TOC concentrations (Figure 11) ranged from 0.2 to 68 mg/L. With the exception of color, there were no clearly apparent spatial trends in concentration, but analysis of the data was hampered by a lack of reported depth data for the wells.

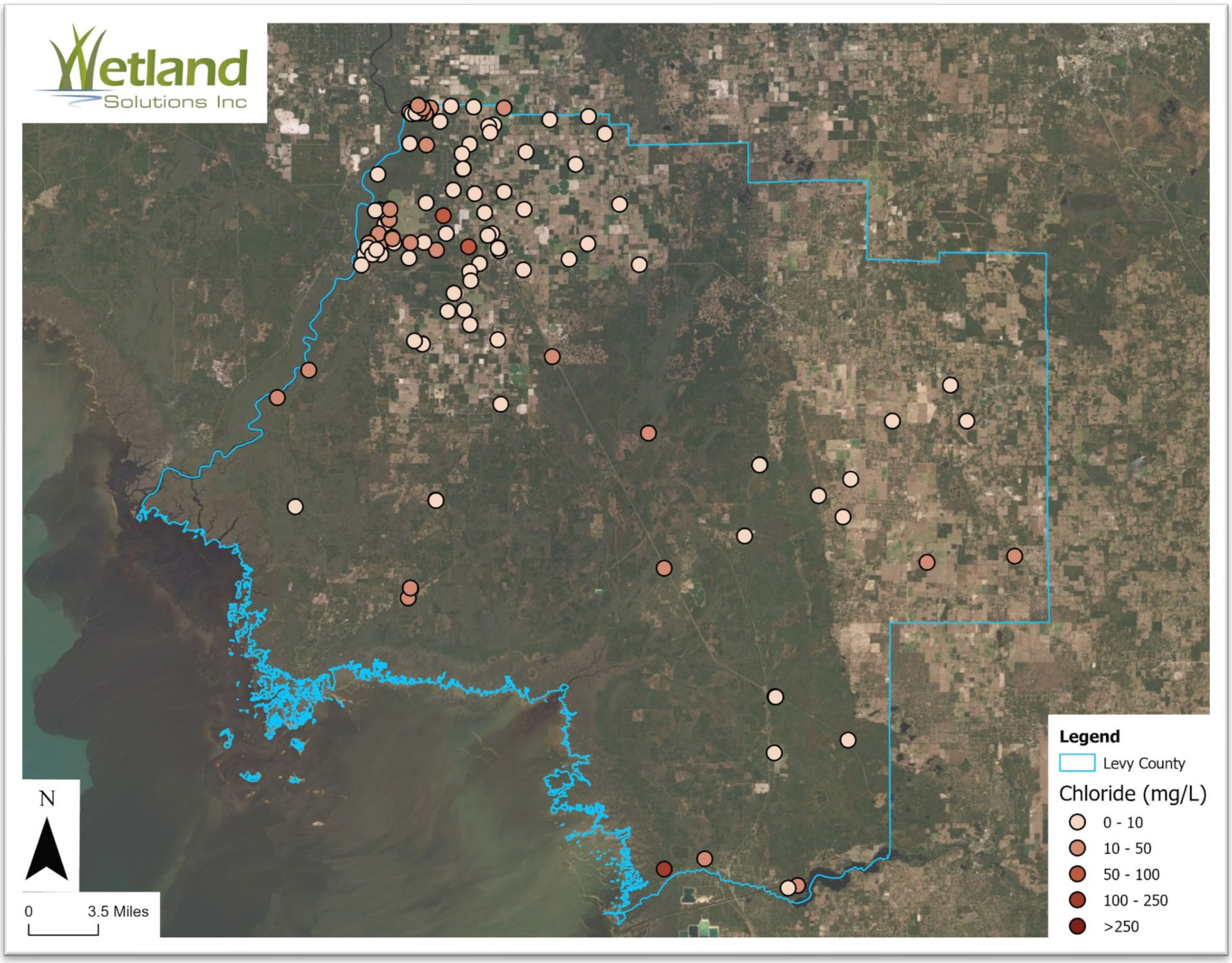

Figure 6. Chloride Concentrations in Levy County UFA Wells

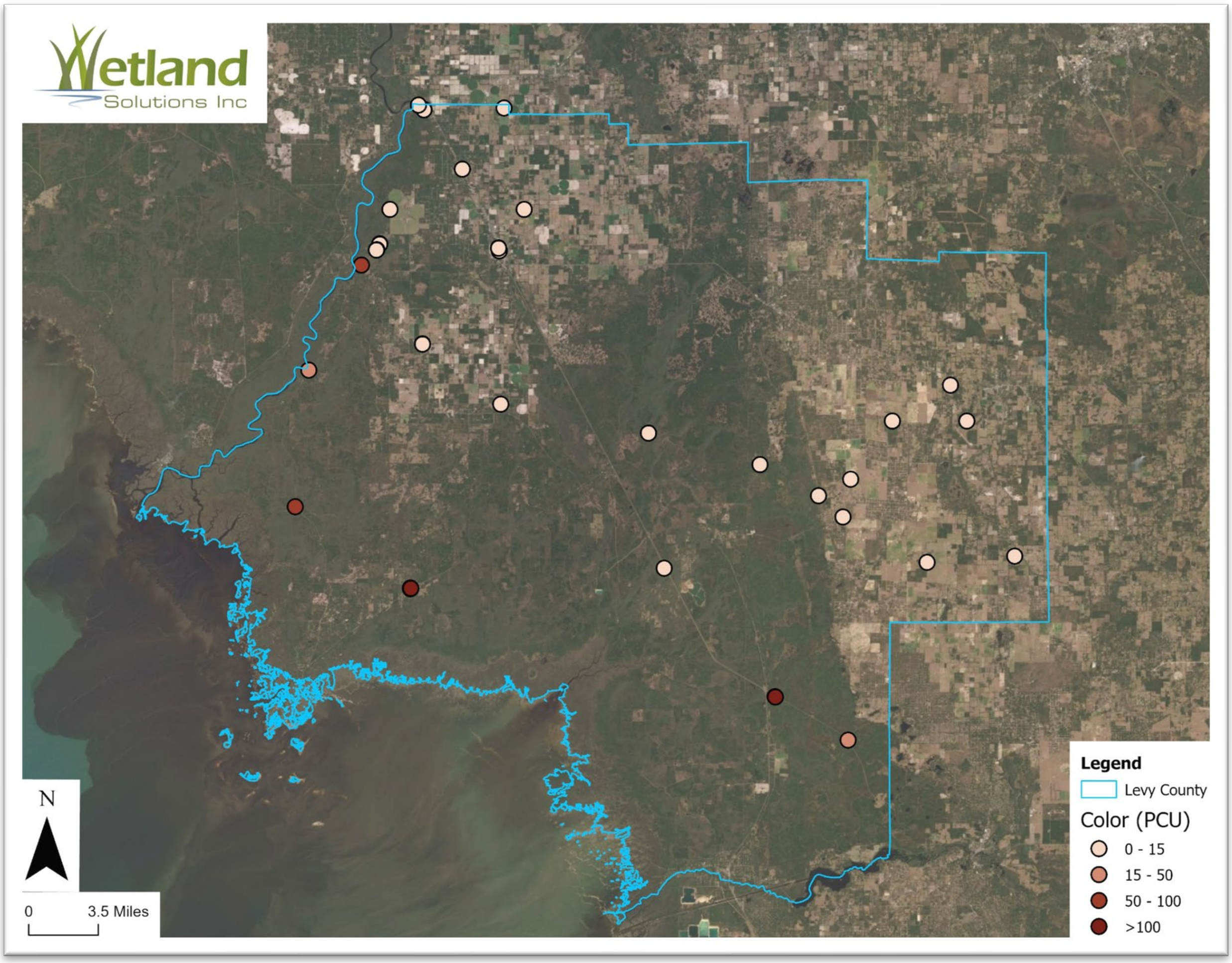

Figure 7. Color Concentrations in Levy County UFA Wells

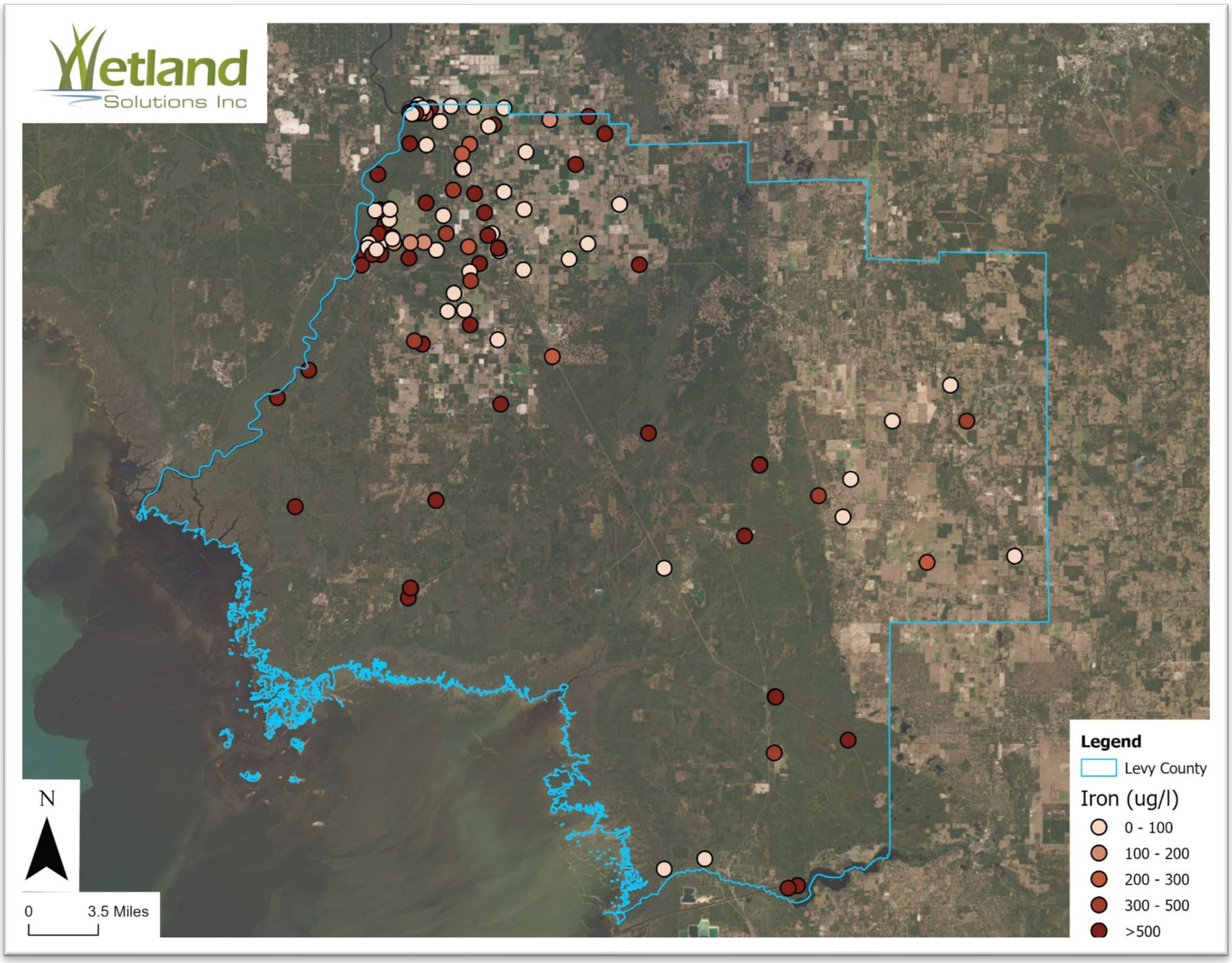

Figure 8. Iron Concentrations in Levy County UFA Wells

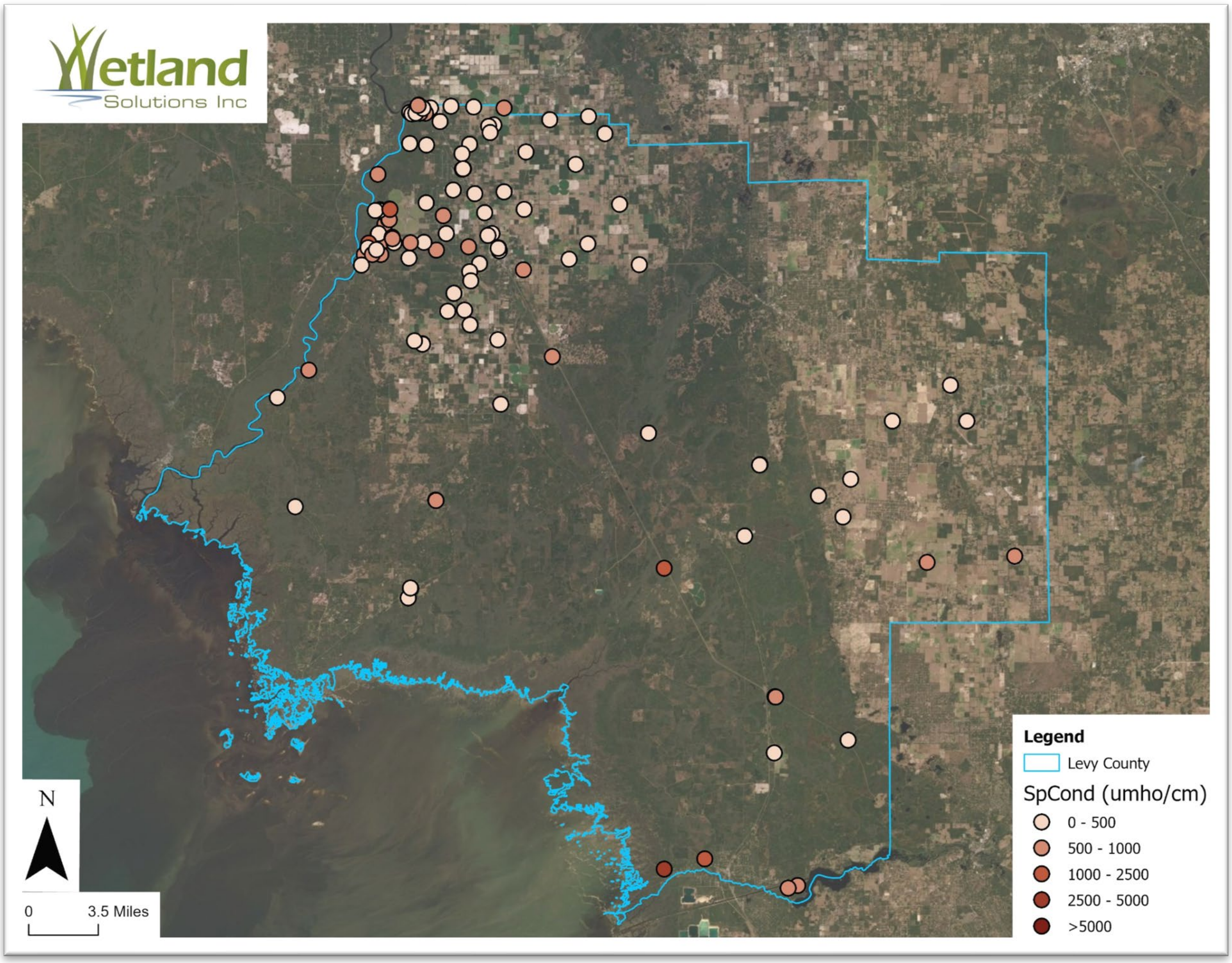

Figure 9. Specific Conductance in Levy County UFA Wells

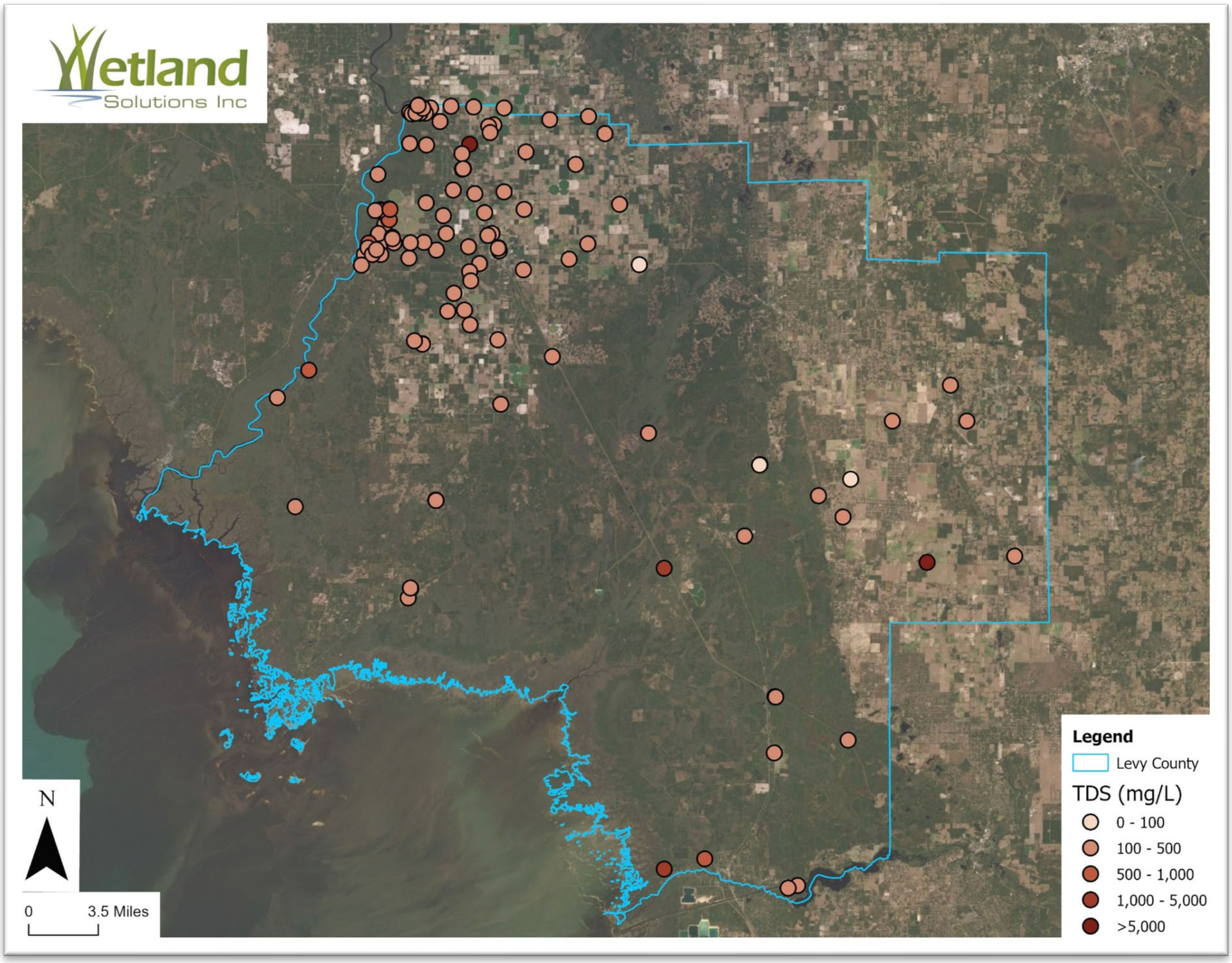

Figure 10. Total Dissolved Solids Concentrations in Levy County UFA Wells

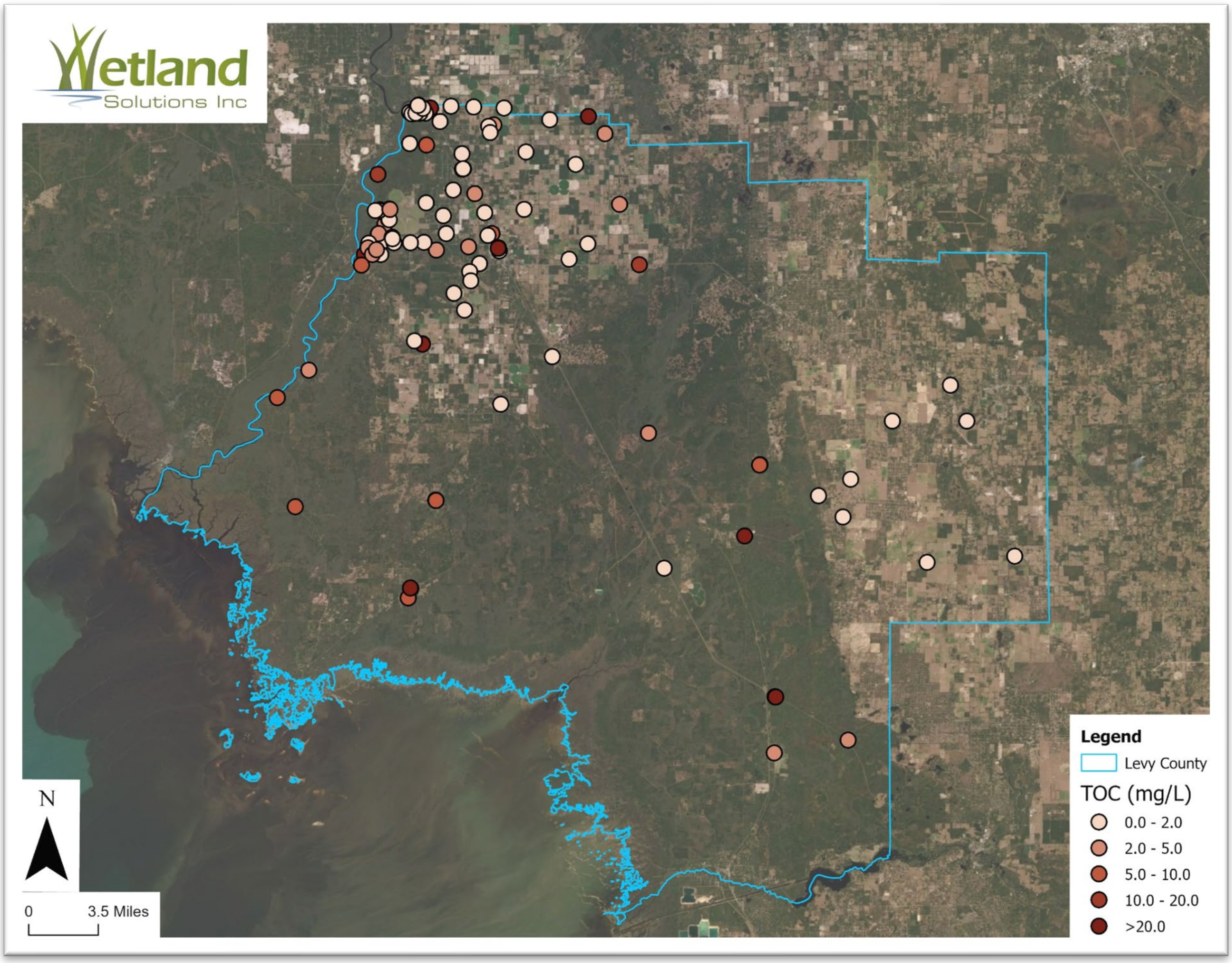

Figure 11. Total Organic Carbon Concentrations in Levy County UFA Wells

2.2.1.3 Treatment Requirements

Treatment requirements vary substantially for water from the UFA within the study area. In Bronson, public supply is accomplished through withdrawal, chlorination, and distribution. Upon moving west, water treatment becomes more challenging as the unconfined UFA is overlain by extensive natural wetlands that contribute tannic water through infiltration. This results in water quality changes with increases in color, TOC, and iron. Treatment of this water for domestic self-supply can require small reverse osmosis (RO) systems or membrane filtration. Similar technologies can be used for larger public systems, although there are typically additional chemical treatment steps. Cedar Key's water treatment process is an example of a conventional treatment train approach that can be used to produce water to potable standards from the water source between west of Bronson and the coast. It includes:

- Initial treatment with sodium permanganate,
    - Permanganate reduces taste and odor issues, iron, and disinfection byproduct (DBP) precursors
- Magnetic Ion exchange (MIEX) to reduce TOC,

- Initial chlorination,
- Lime softening to reduce hardness associated with calcium and magnesium,
- Sand filters with aeration,
- Hydrogen peroxide to reduce trihalomethane (THM) precursors,
- Carbon filters to remove DBPs, and
- Final chlorination (with re-chlorination if the residual is not met).

2.2.2 Lower Floridan Aquifer

The Lower Floridan Aquifer (LFA) lies beneath the Middle Confining Unit and ranges from about 600 to 1,200 feet below land surface between Bronson and Cedar Key (Miller 1986). The LFA is composed of dolomite and limestone. It should be noted that because the LFA is brackish (Section 2.2.2.2) and membrane treatment is required (Section 2.2.2.3), there is about a 20% loss of withdrawn water associated with the membrane concentrate that requires disposal.

2.2.2.1 Availability

With adequate water supply in the UFA near Bronson, it is unlikely that the LFA would be considered as a source until future demand projections and drawdown modeling exercises indicate that there would be undesirable impacts associated with increased withdrawals. The shallowest zone with adequate transmissivity for water supply is the Lower Avon Park permeable zone which occurs at depths between about 800 and 900 feet near Otter Creek and Cedar Key (Williams and Kuniansky, 2015). Presently, there are no known production wells in the LFA in Levy County. While the LFA could be a future source of water for these communities, it is more likely that the UFA would continue to be used and treatment would be improved to enhance finished water quality.

2.2.2.2 Water Quality and Spatial Variability

As noted above, USGS studies (Williams and Kuniansky, 2015) show that the depth to the 10,000 mg/L TDS concentration "line" decreases rapidly between inland areas and Cedar Key. There were 3 LFA wells found in SRWMD, FDOH, and STORET databases in Levy County with recent water quality data records. Historical data were also located for an oil and gas exploration well (Well P-13) drilled in 1946 about 9.8 miles south of Otter Creek and 3 miles east of US-19. Table 1 shows the available data from these wells. In general, with the TDS and specific conductance data following the expected increase in salinity with increasing depth.

Table 1. Water Quality in Levy County Lower Floridan Wells

Well ID	Depth (ft)	Chloride (mg/L)	Color (PCU)	Iron (ug/L)	Specific Conductance (umhos/cm)	TDS (mg/L)	TOC (mg/L)
P-13	1,089	39.0	--	180	111	807	--
P-13	2,650	248	--	--	263	2,210	--
ROMP 131.5 L Fldn Aq (Below MCU I)	650	10.1	0.77	8.50	293	250	0.77
ROMP 131.5 L Fldn Aq (Below MCU II-A)	1,121	14.0	--	35.9	588	373	--
ROMP 131.5 L Fldn Aq (Below MCU II-B)	1,338	14.0	--	252	615	46,500	--

2.2.2.3 Treatment Requirements

LFA source water requires membrane-based treatment processes such as RO to provide suitable finished water quality. Typically, various pre-treatment steps such as sand filtration and cartridge filtration are also required to remove solids that would blind the RO membranes. The process train may also require pH adjustment and the addition of anti-scaling chemicals to further maximize membrane cycle time and lifespan and the RO step will be followed by disinfection prior to distribution. Membrane treatment facility costs for LFA source waters are 3-5 times more expensive than costs for facilities treating high quality UFA source waters. As noted above, membrane treatment produces a concentrated waste stream that requires disposal, typically in a deep injection well that is completed below the confining unit beneath the USDW. In the study area, this depth starts at about 1,500 feet below land surface. The concentrate stream also constitutes about 20% of the raw water volume, meaning that 1.25 gallons of raw water need to be withdrawn and treated to produce 1.0 gallons of finished water.

2.3 Water Source Discussion

The surface water and groundwater sources discussed have a wide variety of qualities and potential challenges for treatment across the study area. The highest quality water source is the UFA in the eastern and northern portions of the study area which is of exceptional quality and requires minimal treatment. Water quality within the UFA degrades from the higher sandy ridge areas near Bronson and Chiefland as topography drops onto the coastal plain in the Waccasassa River and Gulf Hammock area. This change in water quality is characterized by higher color, TOC, and iron. In these areas water quality treatment is also complicated because of the potential for disinfection creating DBPs without adequate pre-treatment. Surface water sources including fresh, brackish, or saltwater have equivalent or more significant treatment related challenges with the level of treatment and cost increasing as the water source becomes more saline. Similarly, treatment of LFA water will be more complex and more costly than treating either the higher or lower water qualities within the UFA. From the quantity standpoint, UFA water near Bronson is currently considered to be available to meet the future demand in the study area. Similarly, LFA water and brackish to saline surface waters are sufficiently available. Fresh surface water sources located closer to Otter Creek and Cedar Key (e.g., the Waccasassa River) are not expected to be consistently available at the flows needed without potentially causing adverse environmental impacts.

Given the water qualities and availability of the various sources it appears that the best locally available source of water for each utility is currently being used. While water quality in the Cedar Key and Otter Creek areas is of lower quality than water in the Bronson area, this water is more treatable than alternative water sources in the vicinities of these utilities. However, given regional water qualities, the UFA near Bronson or north towards Chiefland appears to offer the optimal water source in the area.

Section 3 Independent Water Supplies

While the previous section noted that the inland UFA is the preferred source of future water supply, it is technically feasible for Cedar Key and Otter Creek to continue to use their existing wells with either current or enhanced treatment processes. With current treatment processes, Cedar Key produces a water of good quality that meets applicable standards. Otter Creek's current process does not offer a water of high quality and is not used by most residents for consumption, but current projects and pilot studies are underway to improve quality. Technically viable future water supply alternatives are summarized below for each of the municipalities.

3.1 Cedar Key

The Cedar Key Water and Sewer District (CKWSD) currently provides a water of good quality to its customers via a complex, expensive, multi-step treatment process. During the past several decades, CKWSD's existing wells and well fields have migrated inland as more coastal wells have been impacted by saltwater intrusion. Given loss of use at Wells 1, 2, and 3 it appears possible that this migration will likely continue with wells moved further east in the event of impaired water quality.

While the CKWSD can provide a water of suitable quality to their customers, the water treatment plant was originally constructed in 1962 with various upgrades and process enhancements since that time. Given the age of the water treatment plant it is expected that a new facility will be required to continue to provide good quality water. An estimate for a new water treatment facility was developed for the CKWSD in January of 2022 by Mittauer and Associates, Inc. with an estimated cost of $12.6 million for a facility located near the current well field. The anticipated treatment at this facility is expected to involve many of the same processes currently employed in the CKWSD's treatment system to provide a water of similar or better quality.

3.2 Otter Creek

The Town of Otter Creek currently produces an effluent that is not used for drinking by most of the Town's residents due to color, hardness, and iron. In attempt to mitigate these challenges, the Town has completed pilot projects for filters with a vendor demonstrating technology for a year before turning the system over to the Town. It is not known whether the Town will be able to afford the O&M costs for the filter system.

Otter Creek also has challenges associated with aging infrastructure and has several projects currently underway, seeking funding to replace their pneumatic tank and add additional storage. This is in addition to several recently completed water projects to add high-service pumps and to improve treatment for iron and to reduce DBPs. With these modifications and continued investment in the water system, it is expected that the Town can continue to provide water with similar or improved water quality.

3.3 Bronson

The Town of Bronson currently produces water at a low cost from UFA wells with excellent quality. Current challenges are generally associated with problems in the distribution system versus the water production facilities. A current project is underway to increase the capacity of the existing wells to improve system pressures in the town. The Town of Bronson is expected to be able to continue to provide high quality water to their residents.

3.4 Unincorporated Levy County

Residents in unincorporated areas of Levy County rely on domestic self-supply for their water. Within the project area and along SR24, there are the unincorporated communities of Sumner and Rosewood. Based on conversations that were a part of this study, the residents of these areas have significant water quality challenges including hardness, iron, and color. To address these issues, many residents have either individual water treatment systems or purchase their water from retail establishments for consumption. Costs associated with water purchase or treatment can be significant for these residents. These residents would be expected to continue their current water supply strategies, whether through purchase or individual treatment systems.

Section 4 Cooperative Water Supplies

In contrast to independent water supplies, this project is considering cooperative water supplies to address the challenges associated with existing water quality for the communities. With consideration of the various challenges experienced by the communities, this study considered a range of alternatives to develop cooperative water supplies. Each of these options is discussed in additional detail in the following sections.

4.1 Regional 1: Cedar Key + County

The CKWSD has developed a water system that allows for compliance with applicable water quality standards despite challenging water quality conditions in their supply wells. The CKWSD's treated water therefore offers a better product than can be achieved by many residents within the unincorporated communities of Sumner and Rosewood. Given the previous discussion of the CKWSD, potentially constructing a new water treatment plant in the vicinity of their current well field there is an opportunity for CKWSD to provide high-quality water to residents and businesses in Sumner and Rosewood. This could be accomplished by the CKWSD expanding their service area to include these communities which would allow for provision of water and billing of these customers. The approximate distance from the existing Cedar Key well field to Sumner is 1.6 miles with an additional 2.3 miles to Rosewood as shown in Figure 12. This alternative would have the benefit of increasing revenue to help fund the new Cedar Key water plant and operations while improving water quality for customers in Sumner and Rosewood. For residents and businesses that currently rely on individual treatment systems or purchase water for consumption, there is the potential that this water supply could result in cost savings associated with provision of safe drinking water. The total approximate pipeline length is 3.9 miles.

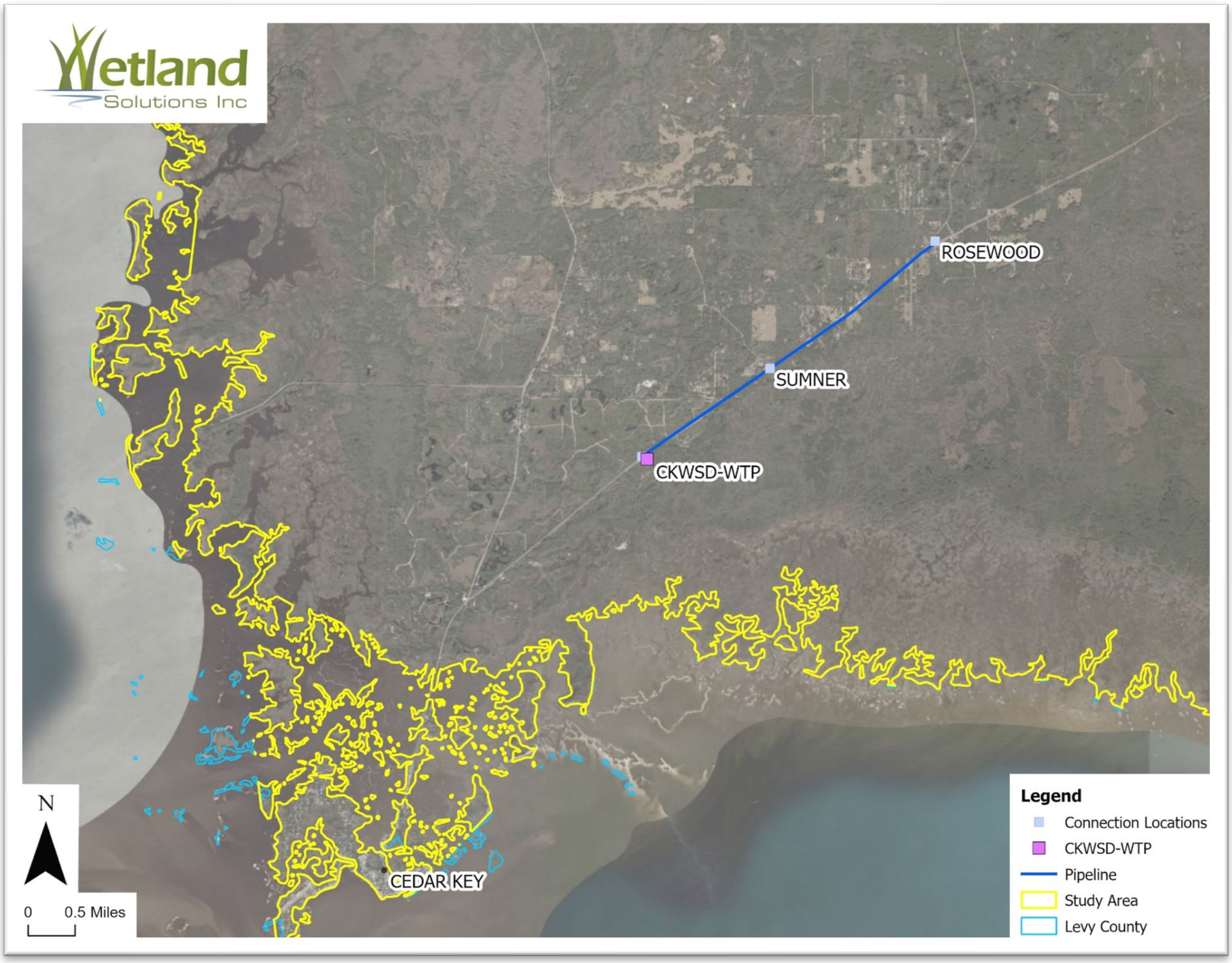

Figure 12. Cedar Key Pipeline to Sumner and Rosewood

4.2 *Cedar Key + County + Otter Creek*

When considering projects that may involve more partners there is increased potential for making modifications to the system to improve water quality, operation, and cost. These opportunities are discussed for Cedar Key, unincorporated Levy County, and Otter Creek in the following sections.

4.2.1 Regional 2: Cedar Key Wells

Expanding on the concept of the CKWSD providing water to Rosewood and Sumner, there may be the potential for CKWSD to extend water service to Otter Creek. This is an additional 11.7 miles of pipe from Rosewood and would allow Otter Creek to discontinue use of their existing water system. However, this project would require grant funding, as neither utility would be able to afford or feasibly pay for this pipeline while maintaining affordable rates. The inclusion of Otter Creek would help CKWSD cover the costs of construction of the new water plant, excluding the pipeline, while reducing redundant facilities, operation, and water testing between the facilities. Relative to treatment it is likely that either: CKWSD would need to provide re-chlorination and pumping prior to water entering Otter Creek's system, or that Otter Creek would need to provide the same after accepting the water. This project would most likely involve CKWSD expanding their PSA to include Sumner and Rosewood and developing an interlocal agreement with Otter Creek for provision of water. The anticipated pipeline alignment is shown in Figure 13 with an approximate total length of 15.7 miles.

Figure 13. Cedar Key Pipeline to Sumner and Rosewood and Otter Creek

4.2.2 Regional 3: Regional Water Authority

A second considered alternative was CKWSD and Otter Creek developing a Regional Water Authority (RWA) to pursue a joint project from a new, higher-quality water source. The concept for this project would be to develop new wells and a treatment facility northwest of Otter Creek and south of Chiefland's PSA with water piped to the SR24 corridor with a tap/master meter to Otter Creek and a tap/master meter to CKWSD. In this scenario, CKWSD would expand their PSA to serve Rosewood and Sumner and receive water from the newly-formed RWA just east of Rosewood. The potential location for a well field and co-located new water treatment facility and the expected pipeline alignment are shown in Figure 14 with a pipeline length of 20.9 miles. This scenario offers the benefit of serving the areas that currently have poor source water quality while minimizing pipeline distance and providing water from a higher-quality water source that is expected to have fewer treatment requirements and reduced operational costs.

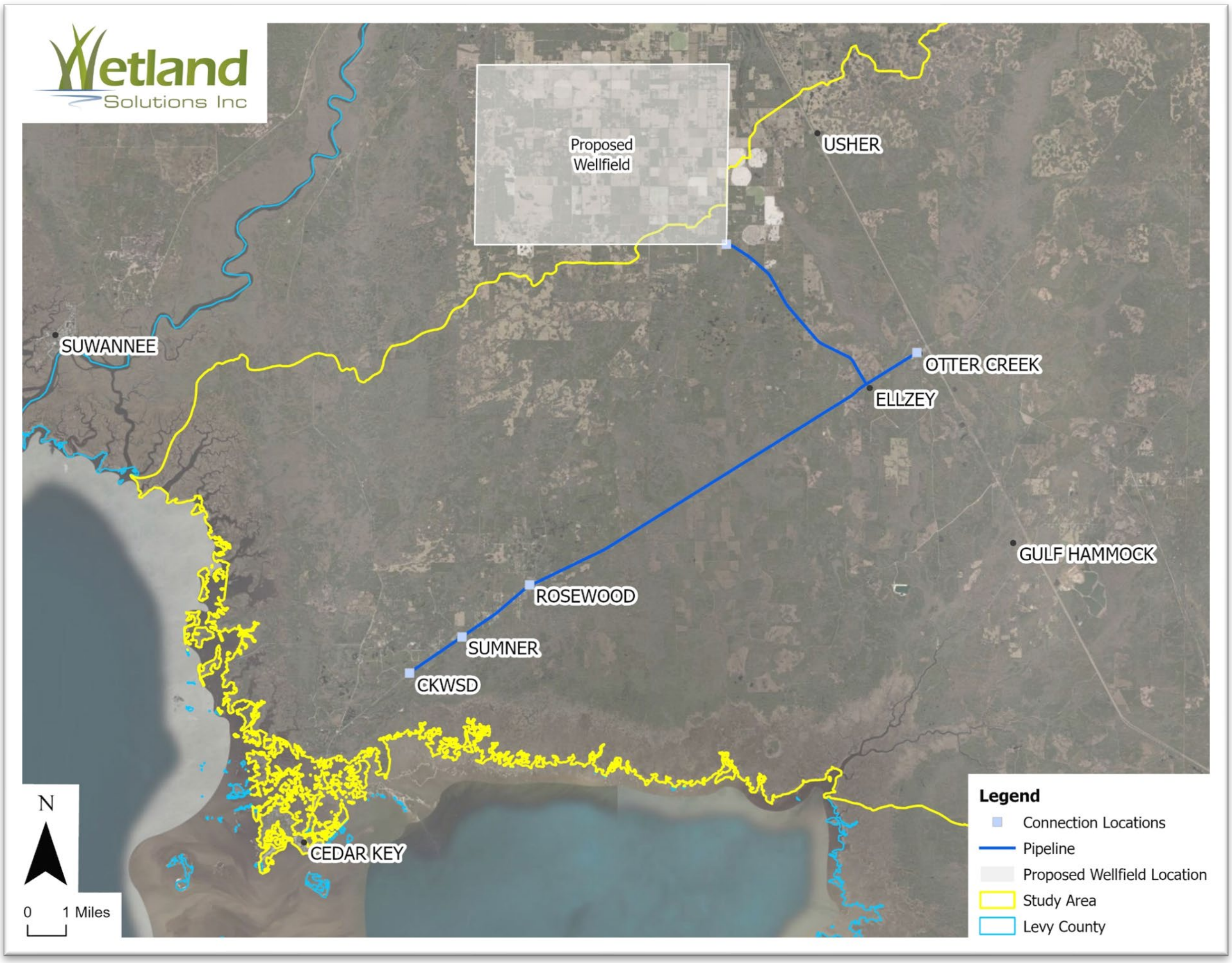

Figure 14. Cedar Key Pipeline to Sumner and Rosewood and Otter Creek

4.3 Regional 4: Cedar Key + County + Otter Creek + Bronson

The final cooperative scenario considered was development of a RWA that would serve water to Bronson, Otter Creek, Cedar Key, and areas of unincorporated Levy County along SR24. It is expected that the well field and treatment facility for this WRA would be near Bronson with a tap/master meter to the Town of Bronson, a tap/master meter to Otter Creek, and a tap/master meter to the CKWSD. To serve the communities of Rosewood and Sumner, the CKWSD could potentially expand their service area and receive water through a connection east of Rosewood, or Levy County could develop a public water supply entity to provide water in these areas. In this scenario, it is expected that the RWA would provide water to each of the involved entities with billing of customers completed by the municipality. This project has the benefit of pumping water from the UFA in an area with excellent water quality and expected low treatment requirements. Use of a RWA provides several benefits that are discussed in additional detail in later sections. The approximate pipe alignment is shown in Figure 15 with a total length of approximately 28.9 miles. This scenario has the benefit of reducing redundant operational and monitoring costs between the utilities and significantly reducing treatment costs for both Otter Creek and the CKWSD which will help offset the cost of pumping water to the project partners.

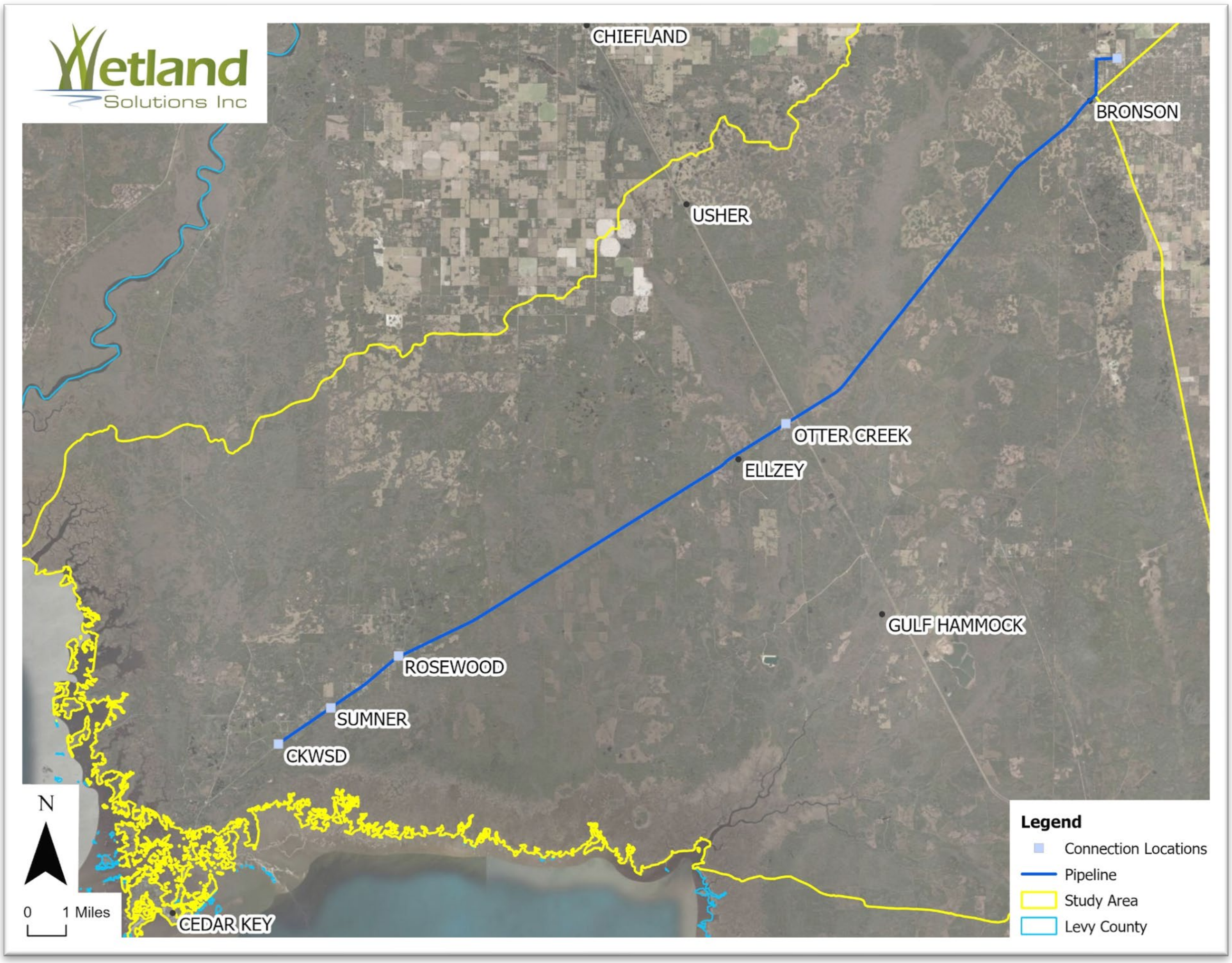

Figure 15. Regional Water Authority Pipeline to Bronson, Otter Creek, Rosewood and Sumner, and Cedar Key

4.4 Alternatives Evaluation

After consideration of the individual and cooperative paths forward, a qualitative alternatives evaluation was developed (Table 2). This initial alternatives evaluation will be refined with incorporation of wastewater and cost considerations developed as part of future tasks. Based on this qualitative analysis it is observed that Sumner and Rosewood are expected to remain unserved unless there is a regional solution. Bronson is observed to have similar outcomes regardless of an independent or regional approach. Cedar Key and Otter Creek are expected to continue to have poor source water quality in the absence of either the Regional 3 or 4 projects. Given the cost of treating current water sources and the desire of the impacted communities to incorporate neighbors, an independent approach is not recommended, except possibly for Bronson.

By developing the Regional 1 project, higher quality finished water can be provided to both Sumner and Rosewood, as well as to Otter Creek in the Regional 2 project. Drawbacks of these alternatives include continued high treatment costs because of poor source water quality. The Regional 3 project resolves source water issues by relocating wells to an area with better source water quality. This alternative provides all communities with a better-quality source water but will involve development of a new well field and treatment plant, although treatment requirements and costs are expected to be significantly lower than they are currently. The Regional 4 project offers similar benefits relative to source water quality but includes Bronson and has a significantly longer pipeline length. Both the Regional 3 and 4 projects involve formation of a RWA to own, operate, and deliver water to the partner communities.

Table 2. Water Supply Alternatives Evaluation

Consideration \ Entity	Independent: Cedar Key	Independent: Sumner/Rosewood	Independent: Otter Creek	Independent: Bronson	Regional 1: Cedar Key, County	Regional 2: Cedar Key, County, Otter Creek	Regional 3: Water Authority, Cedar Key, County, Otter Creek	Regional 4: Water Authority, Bronson, Otter Creek, County, Cedar Key
Served[1]	Y	N	Y	Y	Y	Y	Y	Y
Source Water Quality[2]	P	P	P	G	P	P	G	G
Treatment Costs[3]	H	N/A	H	L	H	H	L	L
Treated Water Quality[2]	G	N/A	M	G	G	G	G	G
Pipeline Length (Miles)	N/A	N/A	N/A	N/A	3.9	15.7	20.9	28.9
Regional Project[1]	N	N	N	N	Y	Y	Y	Y
Regional Water Authority[1]	N	N	N	N	N	N	Y	Y
Served Population[5]	M	S	S	M	M	M	M	L
New Wells[1]	N	N/A	N	N	N	N	Y	M

[1]Y – Yes, M – Maybe, N – No

[2]G – Good, M – Moderate, P – Poor

[3]H – High, L – Low

[4]Transmission system only, excludes distribution system pipe lengths.

[5]L – Large, M – Medium, S – Small

Section 5 Framework for Regional Cooperation

Regionalization across entities can create economies of scale to deliver services more cost-effectively for customers. There are a variety of examples of Florida municipalities collaborating to deliver utility services within a specific geographic area. This section provides an overview of the various regional utilities and the methods in which they were formed and operate. Included in the discussion of regional approaches are considerations for local agreements and how governance approach can influence funding opportunities to offset and finance the cost of engineering and construction of the necessary infrastructure for a regional utility authority.

5.1 Regional Water Authority

The drivers to form a regional approach to provide utility solutions vary across the State as do the methods of formation and governance, with interlocal agreements being a common tool towards creating utility partnerships. Interlocal agreements can range from simple to complex individual agreements. The formation of a regional authority is described within the Florida Statutes (F.S), Title XXVIII, Natural Resources; Conservation, Reclamation, and Use, Chapter 373 Water Resources, Part VII, Water Supply Policy, Planning, Production, and Funding and includes the legal authority for regional water supply, under 373.713 F.S.

> *(1) By interlocal agreement between counties, municipalities, or special districts, as applicable, pursuant to the Florida Interlocal Cooperation Act of 1969, s. 163.01, and upon the approval of the Secretary of Environmental Protection to ensure that such agreement will be in the public interest and complies with the intent and purposes of this act, regional water supply authorities may be created for the purpose of developing, recovering, storing, and supplying water for county or municipal purposes in such a manner as will give priority to reducing adverse environmental effects of excessive or improper withdrawals of water from concentrated areas. In approving said agreement the Secretary of Environmental Protection shall consider, but not be limited to, the following:*
>
> > *(a) Whether the geographic territory of the proposed authority is of sufficient size and character to reduce the environmental effects of improper or excessive withdrawals of water from concentrated areas.*
> >
> > *(b) The maximization of economic development of the water resources within the territory of the proposed authority.*
> >
> > *(c) The availability of a dependable and adequate water supply.*
> >
> > *(d) The ability of any proposed authority to design, construct, operate, and maintain water supply facilities in the locations, and at the times necessary, to ensure that an adequate water supply will be available to all citizens within the authority.*
> >
> > *(e) The effect or impact of any proposed authority on any municipality, county, or existing authority or authorities.*
> >
> > *(f) The existing needs of the water users within the area of the authority.*

Under 373. 713 F.S., within Section 2, there are additional powers and duties that include the authority to levy ad valorem taxes, not to exceed 0.5 mill, with an affirmative vote of the electors residing within the County or municipality. Regional authorities can develop, store, and transport water; provide, sell, and deliver water for county or municipal uses and purposes, and provide for services upon terms, conditions, and rates that apportion to parties and nonparties an equitable share of capital cost and operating expenses of the authority's work to the purchaser. Other allowable services include the collection, treatment, and recovery of wastewater.

5.2 Special Districts

In addition to the establishment of a regional authority, in adherence to the rules and polices outlined under 373.713, there is another common legal mechanism called the special district. Not all regional authorities are also special districts and are authorized to serve a special purpose, within a defined geographic territory, such as water and wastewater services. Under Title XIII Planning and Development is Chapter 189 F.S., the Uniform Special District Accountability Act. This section of administrative rules contains the requirements and differences between the special districts, such as the distinction that an independent special district has authority to levy ad-valorem taxes and issue bonds. To create a new district, add or change services provided, or dissolve the district requires the approval of the Florida Legislature as well as ratification of a local referendum. There are several advantages to regional authorities also becoming a special district, such as streamlining the governance and delivery of services as a separate standalone entity as well as simplifying complex local agreements. Challenges aside from the legislative and legal process to establish a special district include extensive reporting and auditing, compliance requirements, as well as administrative and board protocols. Table 3 identifies a subset of regional utility authorities that have been established in traditionally rural areas of Florida.

Table 3. Florida Regional Utility Authorities

Name of Authority	Service	Members	Governance	Established & Governance	Service/Size
Peace River Manasota Regional Water Supply Authority	Potable Water	Charlotte, DeSoto, Manatee, and Sarasota Counties	Board of Directors & Executive Director	1991, Independent Special District under Section 373.1962, F.S. and an interlocal agreement executed	26 MGD
Withlacoochee Regional Water Supply Authority	Potable Water	Citrus, Hernando, Marion, and Sumter Counties, and 13 municipal governments	Board of Directors and a municipal representative from each County & Executive Director	1977, Independent Special District under Section 373.1962, F.S. and by Interlocal Agreement and revised in January 2014	4.6 MGD
Tampa Bay Water	Potable Water	Hillsborough, Pasco, and Pinellas Counties. Cities of New Port Richie, St.	Board of Directors, consisting of municipal and County representatives	1998, non-profit special district. Formed through contracts & legislation to change the West Coast	2.5 Million people

Name of Authority	Service	Members	Governance	Established & Governance	Service/Size
		Petersburg, and Tampa	& General Manager	Regional Water Supply Authority.	
Polk Regional Water Cooperative	Alternative Water Supply	Polk County, Cities of Haines City, Auburndale, Lakeland, Bartow, Davenport, Dundee, Eagle Lake, Fort Meade, Frostproof, Lakeland, Lake Hamilton, Lake Wales Mulberry, Polk City, Winter Haven	Board of Directors, consisting of municipal and County representatives & Executive Director	2017, Independent Special District under Section 373.1962, F.S. and by Interlocal Agreement	15 MGD
Clay County Utility Authority	Potable Water, Wastewater Reclaimed Water	Clay County	Board of Directors, appointed by the Clay County Commissioners and one member by the Governor of the State of Florida & Executive Director	1994, Independent Special District under Section 373.1962, F.S.	50,000 rate payers

5.3 Interlocal Agreement Considerations

Important considerations related to cooperative interlocal agreements are summarized below.

1) Ambiguities of a Newly Formed Utility

    a) Contracts must be specific and contain precise language for the services and actions that drive an interlocal agreement. However, the planning, design, and construction of new infrastructure for a newly formed utility, regional authority, or even an established utility that is expanding its service area requires flexibility within an interlocal agreement to allow the entity to proceed through to the process to deliver utility services, i.e., easement, facilities and upgrades, permitting, rates, financing, etc.

    b) Agreements will be modified because the process of forming includes new financing and rate structures, such as a credit rating, and will include unforeseen contractual needs within the initial agreement. To begin the process of formation other contractual items such as the business of delivering utility services and how that is accomplished will also evolve as the infrastructure necessary for a regional authority is designed, engineered, and then operated which includes additional staffing and resource needs that may not be sustainable in the initial formation.

2) Quantity of Water & Allocations

   a) The formation of a regional authority may occur at a time when there is capacity within the existing infrastructure and the agreement to deliver utility services does not include the need to expand capacity in the future. Interlocal agreements should provide projected infrastructure capacity needs and outline the process to meet facility and operational demands as existing infrastructure ages, regulatory requirements change, and/or the need for services expands.

   b) If the formation of a regional authority requires extensive new infrastructure to provide services, the interlocal agreements can be more complex:

      i) Investment, bond, and financing of new infrastructure requires a newly formed entity to commit to a minimum water allocation. This is necessary to offer credit agencies assurance the new regional authority will have customers and revenues to repay loans and sustain and maintain the new infrastructure.

      ii) Also, in the case of some financing providers such as the Water Infrastructure Finance and Innovation Act (WIFIA) a secondary assurance of the ability to repay the loan is needed as the facilities and distribution infrastructure is right sized to the demand for services with customer payments occurring as infrastructure comes on-line.

      iii) For smaller municipal partners, credit ratings can be challenging, which may require the regional authority to have an anchor member that either has a substantive quantity or allocation of water or can absorb the allocation of a smaller member in the case of default. This can require a very complex series of agreements or may be simplified through loan agency guarantee agreements and/or interlocal agreements but should be noted as a time consuming and necessary consideration of forming a regional authority.

3) Service Areas

   a) The new regional authority should have a service area outlined within the interlocal agreements and items to consider include current and future service areas with agreements defining:

      i) The extent of the regional authority service areas,

      ii) An outline describing how new areas are served and who they may include, and

      iii) Procedures to change or expand the service area.

   b) Should there be two or more service providers, other agreement items may include considerations for:

      i) New residential development,

      ii) Industry and manufacturing,

      iii) Government institutions, and

      iv) Commercial customers.

4) Service Interruptions and Supply Shortages

   a) Emergencies and increased peak demands and other infrastructure needs such as maintenance can alter the utility level of service or result in limitations to water supply. Interlocal agreements should address these interruptions and shortages.

   b) Noticing requirements for the seller and provider to report service interruptions to facilitate routine maintenance and ensure timely repairs should be described.

   c) Agreements may detail notification processes, duration, access agreements and easement procedures as well as resolution reporting.

   d) To offer clarity during a crisis or public health threat, agreements should include disaster and emergency protocols and indicate contractual requirements and limitations of services including outlining the authority's ability to act to provide critical infrastructure services during an emergency. It should be noted that language clarifying when and what conditions constitute as an emergency is a desirable item in interlocal agreements and within operating protocol.

5) Water Quality

   a) The quality of water delivered to the distribution system and how that quality is then delivered to the end user can be very straightforward in the case of an existing entity delivering water directly to customers. However, should there be bulk water provided to multiple buyers, the agreements for ensuring water quality may be more complex.

   b) Other procedural items to be considered within agreements include items ranging from odor and taste to public health threats. Interlocal agreements should contain procedures for the communication and resolution of water quality concerns.

   c) In the case of potable water systems, constituents of emerging concern such as Per- and Polyfluoroalkyl Substances (PFAS) and the concentration of DBPs are contractual items interlocal agreements may also consider.

   d) Wastewater services also should address the water quality of the effluent as an essential consideration of local agreements with evolving state regulations for nutrient concentration and the end use(s) of reclaimed water.

6) Wastewater Compliance

   a) Agreements should identify capacity limits and include procedures for regulatory requirements such as engineering analysis and other regulatory expenses/requirements.

   b) Agreements should include pre-treatment programs and other best management practices that may require local partners to adopt individual local ordinances.

   c) Agreements should define methods and responsibilities to ensure compliance with State and local regulations and how the regional authority will resolve compliance violations with explicit specificity.

7) Rates

a) Depending on the formation of a regional utility there may be either retail rates or bulk rates for water delivered to service providers. Interlocal agreements should detail terms and conditions of the rate categories.

b) Determine rate structures and source for water, wastewater, and reclaimed water and indicate if there are connection fees, meter fees, and other ancillary costs.

c) Operation and maintenance costs can be particularly challenging to quantify for a new utility as there is not existing cost or base assumptions.

d) Future infrastructure needs such as capacity increases and treatment technology upgrades to meet regulatory requirements are escalating and should be planned for.

e) Commodity charge considerations include:

  i) Electricity and treatment chemicals, and

  ii) Capital costs.

f) Failure to pay considerations differ based on the governance structure of the regional authority, if there are multiple providers receiving a bulk service, or if it is a more traditional customer to utility organization.

8) Reselling Water or Capacity

a) Development and future growth in companion with limitations to future water supply should be considered in interlocal agreements and language specifying allocations or limits may be necessary.

b) Depending on structure of the regional authority, language regarding whether water can be resold, indicating limits, and identifying parameters for any differentiated rates should be outlined within agreements.

Section 6 Project Funding Sources

There are a variety of funding sources available to offset the engineering, permitting, and construction costs for water supply projects. This includes Federal and State dollars in the form of grants and loans. Non-match grant programs include legislative appropriations, an unreliable source of funding because of uncertainties in available budget that can affect both, if an appropriation is received, and the dollar amount of the grant. Often other grant money requires matching funds and the source of those funds may have limitations. An example of a limitation is that no Federal or State monies can be used as match money, with exception of American Rescue Plan Act (ARPA) funds which are an allowable Federal to Federal match. Other considerations for leveraging grants to supplement local dollars include the application cycle and requirements such as permits and design milestones. Grant monies in Florida can also include springs dollars, alternative water supply, and water quality improvement grants. Other funding sources include less traditional sources such as collaboration with non-governmental organizations (NGOs) and Private Public Partnerships (P3s).

6.1 State Revolving Fund

Annually, the State through the FDEP submits a request to the Federal government to receive Drinking Water and Clean Water State Revolving Funds or a United States Environmental Protection Agency (EPA) capacity grant. This process requires an Intended Use Plan (IUP) that provides EPA detailed information about the twenty percent match the State Legislature must appropriate and how any other dollars earned by the program, such as repaid loans and interest, are to be spent. This is a significant source of funding, for example, in fiscal year (FY) 2018 the State received a $43.7 million award from EPA with a state appropriation of $8.7 million with a total available fund of $124.3 million for drinking water projects. The program sets funding priorities through a publicly-noticed meeting process where the priority lists of funded projects are adopted until the funds are exhausted. The funding process and rules are provided in 62-503, F.A.C. for the state revolving funds (SRF).

The Drinking Water State Revolving Fund (DWSRF) provides low-interest loans for planning, designing, and constructing public water facilities. Funds are obligated based on their priority score per chapters 62-552, F.A.C. After the projects are adopted to the list, the project sponsor may submit loan applications to secure the funds. This program provides low interest loans with interest set as a percentage of the weekly average yield (as listed in the Bond Buyer 20-Bond General Obligation [GO] index for the quarter preceding the execution of the loan agreement). The percentage is then calculated from the Median Household Income (MHI), with the project service area as the variable. The standard SRF loan term is limited to a maximum of 20 years, except for financially disadvantaged communities which can receive 30-year loans.

Small, disadvantaged communities can have a portion of their loan principal forgiven, 20-90%. The definition of a small, disadvantaged community is a public water system that serves a population of 10,000 or fewer with a household income below the state average. For disadvantaged communities not meeting the definition of small, 20% loan forgiveness may be available.

The types of projects that can be funded under this loan program include, but are not limited to:

1. Construction or upgrade of treatment facilities,
2. Installation or upgrade of disinfection facilities,
3. Transmission lines and finished water storage,
4. Acquisition of land, if needed, for the purposes of location of eligible project components.

6.2 Water Infrastructure Finance and Innovation Act

The Water Infrastructure Finance and Innovation Act (WIFIA) is administered by the Federal Credit Reform Act of 1990 (FCRA) and includes over 100 funding assistance programs across the Federal Government. At present the WIFIA program has closed 82 loans totaling over $14.4 billion in credit assistance to help finance water infrastructure projects (Environmental Protection Agency 2022). Additionally, there are another 72 projects pending with a total value of $12.2 billion. Credit subsidy previously appropriated but unencumbered can roll over to future years. When the credit subsidy is appropriated, WIFIA may release notice of funding availability (NOFA). In addition to a qualifiable project there is a threshold of at least $20 million in loan requirements to be considered as an applicant; except for the credit subsidy set aside of available funds for small, rural communities with populations of less than 25,000 with project costs of $5 million dollars. The maximum loan amount for a WIFIA loan is 49% of project costs.

WIFIA is a federal program to provide long-term, low-cost, supplemental credit assistance under customized terms to creditworthy water and wastewater projects of national and regional significance. The EPA identified four project priorities:

1. Extreme weather change retrofits including water recycling and managed aquifer recovery,
2. Public water systems and conveyance systems,
3. Green infrastructure, and
4. Infrastructure repair, rehabilitation, and replacement.

Examples of WIFIA projects in Florida include:

1. Osceola County Board of County Commissioners: Regional Stormwater Facility
2. Miami-Dade County: Ocean Outfall Compliance Injection Wells (3)
3. Pasco County Board of County Commissioners: Wesley Center Wastewater Treatment Plant
4. Polk Regional Water Cooperative
5. TOHO Regional Water Authority

One of the most beneficial advantages of a WIFIA loan is the ability to secure a substantial amount of long-term funding from a single source, resulting in one, fixed, low-interest rate. Another advantage, loan maturity, is connected to the project(s) substantial completion. The WIFIA program allows for the loan to be secondary to other funding mechanisms. There is a deferral period of up to 5 years where neither interest nor principal payments are due. Another advantage is the loan duration, up to 35 years, with the deferral option considered. Typically, interest rates are competitive at slightly less than 30-year revenue bonds.

The interest rate is no less than the yield on U.S. Treasury securities of a similar maturity to that of the WIFIA loan on the date of execution of the credit agreement. The WIFIA program estimates the yield on comparable Treasury securities by adding one basis point to the State and Local Government Series (SLGS) daily rate with a maturity that is equal to, or greater than, the Weighted Average Life (WAL) of the WIFIA loan. The interest rate will be a single, fixed rate established at closing. It is possible for the prospective borrower to receive multiple disbursements, but the interest rate will be the same for all disbursements. The WIFIA credit instrument shall not be exposed to material amounts of unhedged variable rate debt in the borrower's financing structure. The average interest rate for the 82 closed loans was 5.74% (Environmental Protection Agency 2022).

6.2.1 Amortization

WIFIA loans may capitalize interest, as warranted by the cash flow profile of the project. However, the WIFIA program will not increase its investment in a project by capitalizing interest when other project creditors are withdrawing their investment through principal amortization. The WIFIA program shall seek to amortize the WIFIA credit instrument over the useful life of the project. The loan maturity date must be the earlier of 35 years after the date of substantial completion of the project, or the useful life of the project. Debt service payments must commence no later than 5 years following substantial completion of the project. There is an opportunity to accommodate the projected cash flow from project revenues and other sources and to sculpt debt service payment.

6.2.2 Deferrals

Deferrals may be granted at the sole discretion of the Administrator and can be contemplated in the credit agreement; however, there must be a reasonable assurance of repayment of the WIFIA loan. Final maturity of the WIFIA credit instrument must remain unchanged. The borrower may prepay in whole or part without penalty, but it is important to note that federal funds cannot be used to prepay.

Disbursements of WIFIA loan to fund eligible incurred project costs are solely based on submitted invoices, receipts, and the supporting documentation. Disbursement timing can be structured around the needs of the project financing plan but shall be insulated from risk.

6.2.3 Loan Application Process

The application process begins with a letter of interest (LOI) to provide EPA with the necessary information about the purpose of the project, demonstrate the relationship between the project and the WIFIA selection criteria, as well as provide EPA an LOI point of contact. The WIFIA website includes a LOI form for the applicant. There is no fee to submit an LOI. This form supports the applicant to succinctly provide borrower information and provide the details of the project planning. This first step in the process provides EPA a method to preliminarily assess the credit worthiness of the applicant, evaluate the feasibility of the project and determine the project eligibility for a WIFIA loan. The LOI includes an overview of the project readiness to proceed, organizational structure, and the financial status and experience in executing similar projects.

Examples of specific supporting information includes applicants address, Dun and Bradstreet Data Universal Number System (DUNS) identifier, as well as financial verification through the inclusion of year-end audited financial statements for the previous three years, as available. A financing plan includes the amount of credit the applicant is seeking from the WIFIA program and a detail of the proposed sources and uses of funds for the project. The plan must also include specific financial details such as revenue source, project credit characteristics, how senior obligations of the project provide investment grade rating and the anticipated WIFIA instrument rating. The financial plan should also provide the summary of revenue and expense projections for the duration of the WIFIA debt.

The detailed project section (15 pages) must include the following information:

1. Project Description
2. Location
3. Construction Plans and Specifications
4. Estimated Project Cost
5. Project Schedule
6. Alternatives Analysis
7. System Engineer's Report
8. Environmental Review
9. Other Permits and Approval
10. Project Management and Compliance Monitoring Plan
11. Risks and Mitigation Strategies

To describe the borrower's ability to operate and maintain the project over the life of the WIFIA loan an operation and maintenance plan (8 pages) must be submitted that includes:

1. Operation and Maintenance Plan
2. Management Experience
3. Operational Risks and Mitigation Strategies

The financing plan (15 Pages) provides the WIFIA underwriting team a comprehensive understanding through the inclusion of the following information:

1. Proposed Terms for WIFIA Assistance
2. Preliminary Rating Letter
3. Available Sources of Security
4. Dedicated Sources of Income for Repayment
5. Sources of Funds
6. Cash Flow Pro Forma
7. Financing Restrictions

6.3 United States Department of Agriculture

The United States Department of Agriculture (USDA) administers the Rural Development (RD) loan program to provide funding for drinking water and waste disposal systems. This program prioritizes funding projects to increase the availability of safe drinking water and sanitary waste disposal to improve economic vitality of rural areas. The USDA-RD loans provide funding for construction of water and wastewater facilities in rural communities with populations less than 10,000. Funding through this program is applied for via a web portal, RDApply. This submission system allows for the application and pertinent documents to be uploaded. This online portal requires a Level 2 eAuthentication ID for project submission, which can be applied for online or by visiting a Local Registration Agent (LRA). Grants for as much as 75% of the project costs may be provided for projects which pertain to public health, safety, or environmental improvement depending on the income level and community need.

6.4 Suwannee River Water Management District Cooperative Funding

The SRWMD facilitates and offers funding opportunities through several programs. Each of these programs is discussed further in the following sections.

6.4.1 State Springs Grant Program

The SRWMD is responsible for selecting and passing on projects from within the SRWMD that are designed to improve the quality and quantity of water resources. These grants can be provided with or without local cost-share depending on the purpose, size, and entity seeking funding. Types of projects that can receive funding include: agricultural best management practices, hydrologic restoration, land acquisition, reuse, stormwater, wastewater collection and treatment, water conservation, or other innovative approaches and efficiencies. This program is based around an annual funding cycle with projects submitted to the SRWMD near the end of the calendar year, typically December, for review. Projects are reviewed by the SRWMD and those that are recommended for funding are forwarded to the FDEP in the May timeframe for selection and approval by the beginning of the fiscal year in October. Funding amounts have been highly variable with some projects of more than $5 million recommended for funding.

6.4.2 State Alternative Water Supply Grant Program

In much the same way as for the springs funding program the SRWMD supports application for projects that develop AWS for Florida's growing economy and that support natural systems. This program includes projects such as: reclaimed water, water conservation, stormwater, surface water, brackish groundwater, desalination, other non-traditional source, other water quantity, or feasibility and land acquisition necessary to implement a regional project. Projects are evaluated in the same manner as for springs funding projects with the same timelines for acceptance. Funding amounts and match requirements vary depending on the project type and entity seeking funding.

6.4.3 Regional Initiative Valuing Environmental Resources Cooperative Funding Program

The SRWMD directly provides funds via the Regional Initiative Valuing Environmental Resources (RIVER) Cooperative Funding Program to improve water quality, protect water supplies, restore natural systems, or provide flood protection. Projects that may receive funding include projects that: provide advanced aquifer recharge, conserve water supply, develop alternative water supplies, enhance or restore natural systems, improve water quality, protect springs, or provide improved flood protection. Funding is evaluated annually with applications typically due in April.

6.5 Local Funding

Investments in local water, wastewater and reclaimed water infrastructure are driven by the needs of the community, as well as the distribution and collection systems. The source of funds necessary to invest can vary and can include utility service fees, municipal bonds, taxes, and special assessments. This section focuses on private investment and non-ad-valorem, as both are outside the common funding mechanisms.

Revenue bonds are typically used for utility construction because the revenue associated with repayment of the bonds is solely taken from the specific revenue generating purpose of the bonds. Unlike General Obligation bonds, revenue bonds do not require a referendum to issue; however, because the taxing power of government is not behind them, they are typically more costly. To proceed with revenue bonds, a newly formed utility will need to have its bond rating determined and internal rate of return of the assets to be constructed would need to be determined. Before entering into a bond, regional authorities can explore bond anticipation notes, which are valid for five years in Florida and can be used to kick start the project while the issuance of revenue bonds is explored.

In Florida, the law requires that bonds may bear interest at a rate not to exceed an average net interest cost rate, which shall be computed by adding 300 basis points to The Bond Buyer "20 Bond Index" published immediately preceding the first day of the calendar month in which the bonds are sold. Before entering the bond market, an evaluation must be performed to determine if the current financial market is willing to underwrite the project related to the bonds. The actual sale of bonds can be handled by investment bankers and can be sold to large investors or put up for private sale for quantities of $5,000 or more.

Another potential local funding source is a non-ad valorem assessment on units of property. This approach provides a recurring source of revenue, but more importantly, provides a uniform and consistent local investment in necessary infrastructure. Considerations include sunset provisions, fee assessment methodology, estimated revenue, collection and program management responsibilities, and the ordinance that crafts the implementation and management of the funds for utility infrastructure.

Section 7 References

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