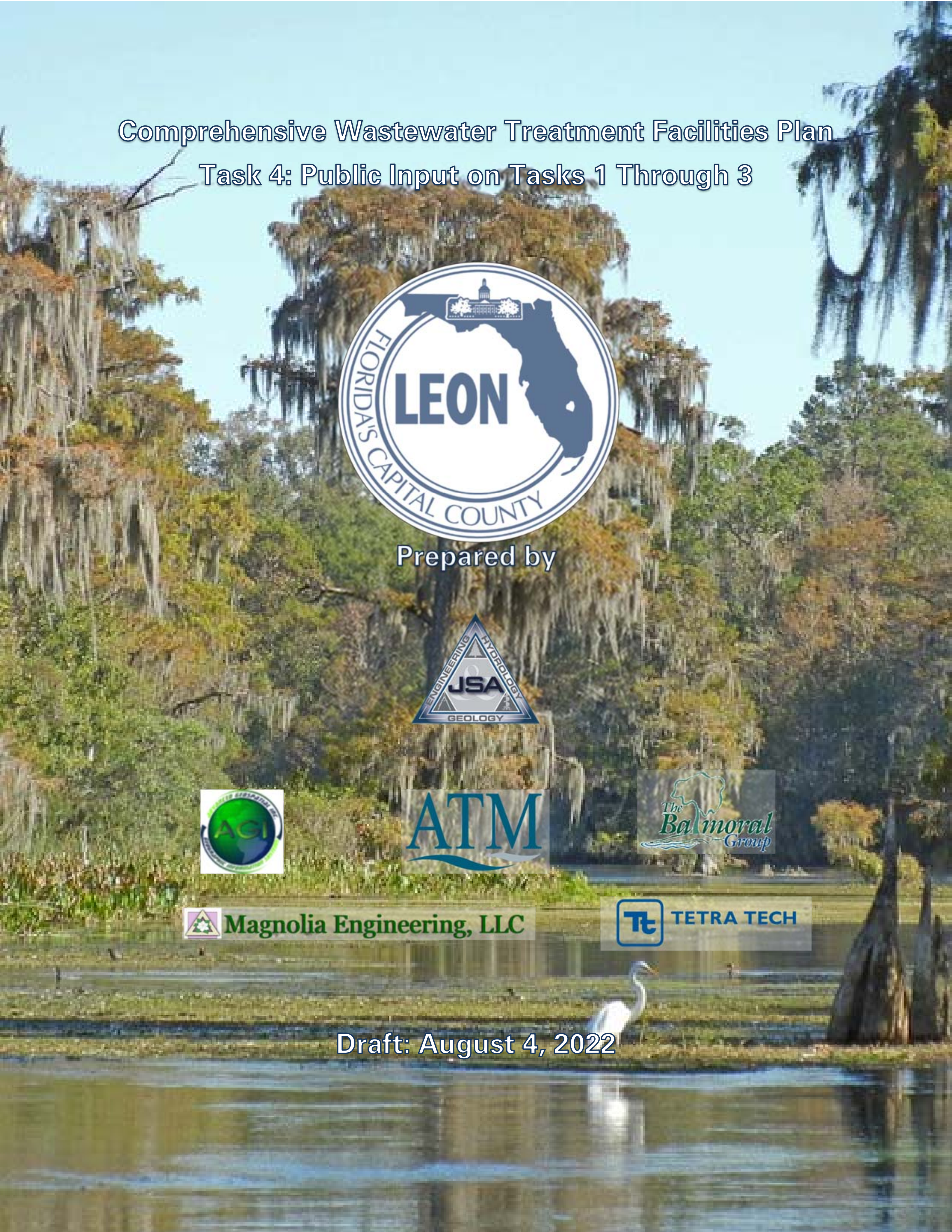
Comprehensive Wastewater Treatment Facilities Plan

Task 4: Public Input on Tasks 1 Through 3



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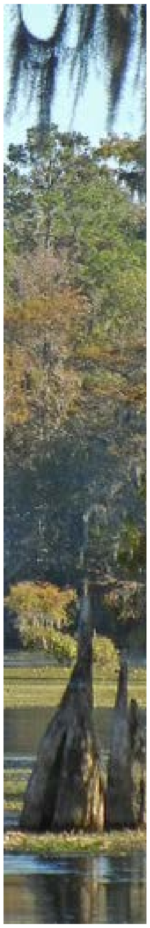
Draft: August 4, 2022



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Acronyms and Abbreviations

AWTS	Alternative Wastewater Treatment Systems
BMAP	Basin Management Action Plan
CWTFP	Comprehensive Wastewater Treatment Facilities Plan
DEP	Department of Environmental Protection
FDOH	Florida Department of Health
INRB	In-Ground Nitrogen-Reducing Biofilter
JSA	Jim Stidham & Associates
OSTDS	Onsite Sewage Treatment and Disposal System
TMDL	Total Maximum Daily Load
WWTF	Wastewater Treatment Facility

EXECUTIVE SUMMARY

Leon County is developing a plan to reduce nitrogen loads from existing onsite sewage treatment and disposal systems (OSTDSs), as well as future development, to groundwater and surface waters. OSTDSs are also known as septic systems. The Florida Department of Environmental Protection found that nutrient loads from several sources—including OSTDSs in Leon County—impaired Upper Wakulla River and Wakulla Spring.

Leon County's plan has two parts: (1) a comprehensive wastewater treatment facilities plan for the entire county, and (2) a more focused facilities plan for part of the county that loads nitrogen to the Wakulla River and Wakulla Spring. Objectives of the plan are to: (1) identify OSTDSs to transition to alternative wastewater treatment systems (AWTSs) where the transition will most reduce nitrogen loads to surface waters and groundwater; and (2) identify future development that will require AWTSs to reduce nitrogen loads to surface waters and groundwater.

Leon County is developing the plan by progressing through eight major tasks. This report describes the results of the fourth task: public input on tasks 1 through 3. This task involved a series of six public meetings with stakeholders throughout the county to obtain input on the tasks completed to date and to guide future project tasks.

1.0 Introduction

The Florida Department of Environmental Protection (DEP) found that nutrient loads from several sources impaired Upper Wakulla River and Wakulla Spring. To develop a plan to restore the river and spring, DEP calculated the maximum amount of nitrate that the river and spring can receive each day, while still satisfying water quality standards. This maximum amount is called a total maximum daily load (TMDL). DEP prepared the Upper Wakulla River and Wakulla Spring Basin Management Action Plan (BMAP) to restore the river and spring by identifying actions that will reduce pollutant loads to the river and spring. The BMAP was adopted by DEP in June 2018 and requires that stakeholders, including Leon County, reduce nitrogen loads to the river and spring from onsite sewage treatment and disposal systems (OSTDSs). OSTDSs are also known as septic systems. Leon County contracted Jim Stidham & Associates (JSA) to develop the plan to reduce nitrogen loads from OSTDSs. JSA partnered with Advanced Geospatial, Applied Technology & Management, The Balmoral Group, Magnolia Engineering, and Tetra Tech to develop the plan. JSA and these partners are referenced throughout this plan as the JSA team.

The Leon County plan has two parts: (1) a comprehensive wastewater treatment facilities plan (CWTFP), and (2) a more focused facilities plan for the part of the county governed by the BMAP. The CWTFP is funded through a grant from the Blueprint Intergovernmental Agency. DEP funded the BMAP plan with a grant to the county. About 40% of Leon County is served by OSTDSs, about 20% is served by five centralized wastewater treatment facilities (WWTFs), and about 40% is government land that will not likely be developed during the next few decades and will not likely require wastewater treatment (fig. 1).

The objective of Leon County's plan is to identify existing OSTDSs to transition to alternative wastewater treatment systems (AWTS), where the transition will most reduce nitrogen loads to the river and spring. The plan will produce guidance for retrofit of existing development as well as direct technology selection for future development. The JSA team is creating the Leon County plan by performing the following tasks:

- Task 1. Develop a nitrogen reduction score to identify the likely contribution of nitrogen from OSTDSs to groundwater and surface waters; use the score to quantify, rank, and identify OSTDSs to transition to AWTS; and establish nitrogen reduction criteria for AWTSs for each of the separate delineated areas (Completed)
- Task 2. Quantify cost-effectiveness of AWTS (Completed)
- Task 3. Identify other factors that influence selection of an AWTS (Completed)
- Task 4. Provide education to the community regarding information compiled in tasks 1, 2, and 3 and survey opinions of the citizens of Leon County, with respect to this plan (Draft Completed)
- Task 5. Analyze implementation scenarios for AWTS
- Task 6. Calculate the anticipated decrease in nitrogen load to the Upper Wakulla River and Wakulla Spring, between 2020 and 2040, due to OSTDS transition to AWTS
- Task 7. Provide additional education to the community regarding the information compiled in tasks 1 through 6 and conduct additional survey of opinions of the citizens of Leon County, with respect to this plan
- Task 8. Present the plan to the Leon County Board of County Commissioners

This report describes task 4 of the Leon County plan: public input on tasks 1 through 3. Section 2 summarizes the public meetings held and section 3 summarizes the feedback received.

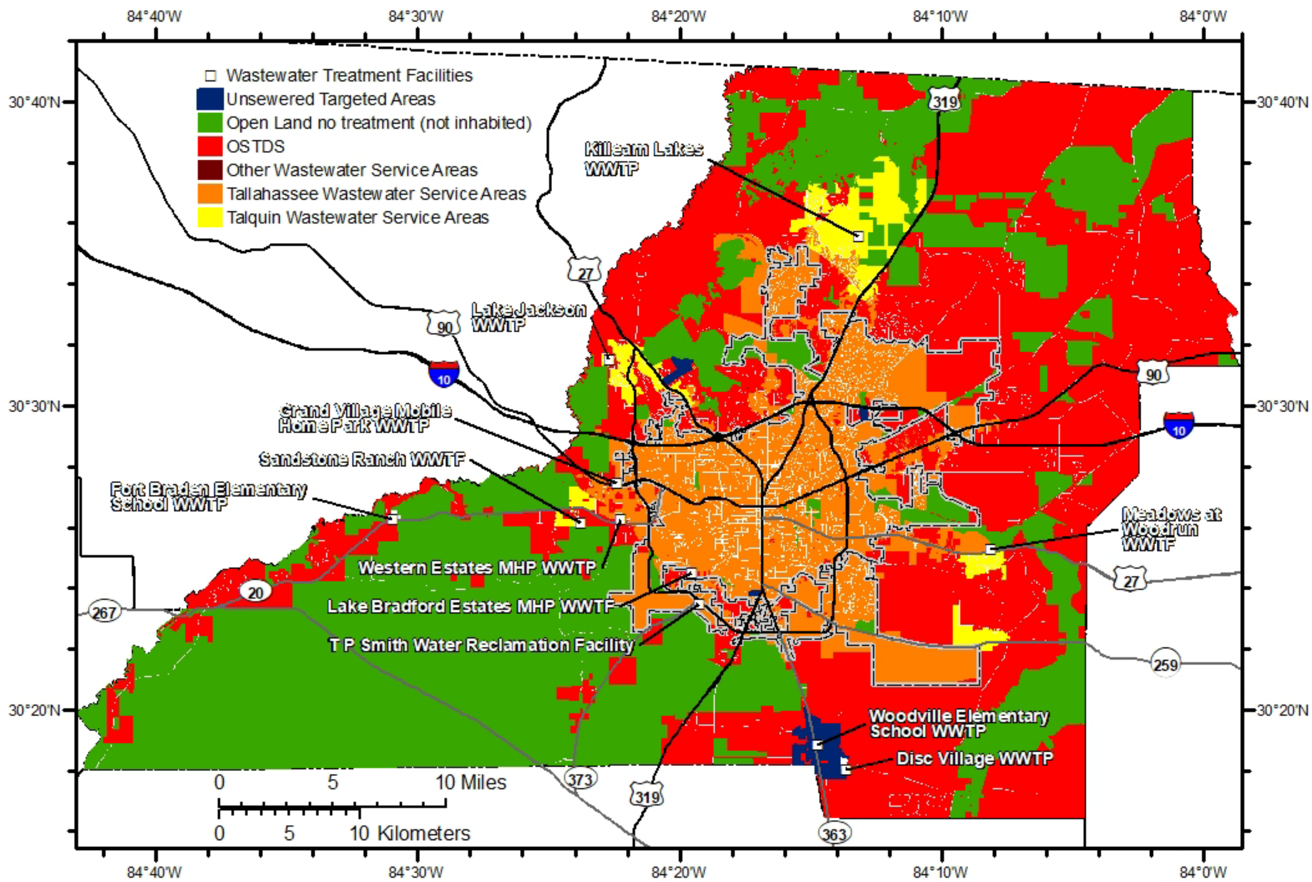

Figure 1. Parcels with an OSTDS, five centralized WWTFs, parcels in the Tallahassee wastewater service area, and parcels in the Talquin service area.

2.0 Public Meetings

Six public meetings were held to discuss the tasks 1 through 3 reports and findings. The first meeting was a virtual meeting held through Zoom on September 10, 2020 with technical stakeholders. This meeting focused on the task 1 report, which was the only completed task at that time. In-person public meetings were held on all three task reports during August 2–5, 2021 in different portions of Leon County to make attending the meeting more accessible. In addition, a follow-up virtual meeting was held on August 17, 2021 through Zoom. The virtual meeting was recorded and posted on the county's website at LeonCountyFL.gov/wastewater.

Table 1 summarizes the public meetings held on tasks 1 through 3.

Table 1. Public Meetings Held on Tasks 1 Through 3

Date	Meeting Location	Number of Participants
September 10, 2020	Zoom webinar (technical public meeting)	4
August 2, 2021	Fort Braden Community Center, 16387 Blountstown Highway	15
August 3, 2021	Woodville Community Center, 8000 Old Woodville Road	7
August 4, 2021	Red Cross, 1115 Easterwood Drive	1
August 5, 2021	Celebration Baptist Church, 3300 Shamrock Street East	1
August 17, 2021	Zoom webinar	6

2.1 Meeting Noticing

The Leon County Office of Community & Media Relations advertised the August 2–5, 2021 in-person public meetings through the following methods:

1. Issued a public notice
2. Advertised on Twitter, Facebook, and Nextdoor
3. Placed flyers at the Woodville and Fort Braden community centers and libraries where those meetings were held
4. Included information in the County Link in the Tallahassee Democrat
5. Placed variable message boards at Woodville, Fort Braden, Capital Circle/Easterwood Drive, and Centerville Road/Shamrock Street
6. Advertised on the Leon County website

The feedback received at the in-person meetings was that most of the participants heard about the meetings from the variable message boards placed near the meeting locations.

For the Zoom webinar held on August 17, 2021, the meeting was noticed through social media on Facebook, Twitter, and Nextdoor; direct email to key stakeholders; and other regular Leon County public notice channels.

3.0 Feedback Received

The first public meeting was held with technical stakeholders about the task 1 report. The feedback from the technical stakeholders was used to refine the task 1 report and was factored into the drafting of the tasks 2 and 3 reports. Therefore, the input received during that meeting is not summarized here.

During the in-person public meetings, feedback was obtained through a comment/question period following the project presentation, discussions between the participants and JSA team members during the open house portion of the meetings, and from comment forms that were distributed to the participants. The comments and questions that were raised during the meetings are discussed here, and the formal comments provided through the comment forms are included in Appendix A.

For the first meeting on August 2, 2021, many of the questions were related to the in-ground nitrogen reducing biofilter (INRB) option. There were also questions about the costs of implementation and other nutrient sources. The following questions and answers were discussed:

Q: What is the estimated cost to install a INRB system?
A: The costs for the INRB system are included in the Task 2 report. The estimated cost for construction used in the report was $6,800.

Q: For the INRB, how deep is it installed, what is it composed of, and how long does it last?
A: The INRB is installed at a similar depth as a standard drainfield; however, the media underlying the drainfield extends deeper. The system involves modifying the drainfield with media to promote bacterial growth that further promotes nitrogen breakdown. Testing is underway to determine how long the media will last before needing replacement.

Q: Am I going to have to replace my 3 year old drainfield with one of these new systems in the next few years?

A: Septic systems within the primary focus area delineated in the BMAP are being required to either upgrade to a nitrogen removing system or connect to central sewer. Other portions of the county will have more flexible requirements.

Q: For the INRB, how long has it been used, who invented it, and what studies say that it works?
A: The INRB is a relatively new technology in Florida, which has been studied by the Florida Department of Health (FDOH). It is currently being tested by counties throughout the state, including Leon County, in partnership with FDOH and DEP.

Q: Who mandated the improvement of the impaired waters and why is it required?
A: The Upper Wakulla River and Wakulla Spring were determined to be impaired by DEP as part of their Clean Water Act requirements. The TMDL was established to reduce nitrogen, and reducing nitrogen is required to help the river and spring meet water quality standards.

Q: If the planned nitrogen levels are not met, what will happen?
A: DEP will continue to require nitrogen load reductions from all sources until the nitrogen concentration target is met at the spring.

Q: What about nitrogen from all the rivers flowing from other counties and Georgia, including the Little River that flows into Lake Talquin?
A: The BMAP included nitrogen loading from all sources within the Upper Wakulla River and Wakulla Spring basin. The basin encompasses other counties but does not extend into Georgia.

Q: I am concerned about local residents on fixed incomes. Are they going to have to come up with $10,000 for a new drainfield?
A: The CWTFP will identify potential options to update or connect existing septic systems to the central sewer system to reduce nitrogen in different areas of the county. Leon County will then determine what options to implement in each area. There may be an opportunity to obtain a grant to help fund some or all the costs of the upgrade or connection to central sewer.

Q: Are we going to have a WWTF constructed and sewer lines installed? If a WWTF is constructed is it going to smell?
A: Depending on the area of the county, homes may be connected to central sewer. The local utilities (City of Tallahassee and Talquin) will determine if they will need to construct a new WWTF. WWTFs include components to minimize odors.

During the second in-person meeting on August 3, 2021, many of the questions were related to the central sewer plan for the county and cluster systems. The following questions and answers were discussed:

Q: Is the central sewer expansion plan presented several years ago still a working, viable plan? Where I can find the status of the sewer expansion projects?
A: Yes. The plan is detailed on the county's website. The county emailed the project website link to participants in this meeting.

Q: Does central sewer have a monthly charge?
A: Yes. Long-term and short-term costs are detailed in the Task 2 report. For example, the cost of a new sewer collection lateral from a house to the municipal collection system is included in the economic projection.

Q: Does the plan differentiate between 1 and 12 people households?

A: The Task 2 report focuses on an average, single family home size. As specific areas of the county are evaluated, these estimates can be refined to match the land use densities in the area.

Q: Will there be one CWTFP for the entire county, or one plan for each part of the county?
A: There is one plan for the entire county, and specific areas will be investigated.

Q: Are grant funds available for individual homeowners to transition from OSTDS to AWTS?
A: DEP and FDOH have some funds available, and Leon County will look for opportunities to obtain funding. State funds range from subsidy to full grants but there are no guaranteed monies. Leon County currently has a funded INRB pilot project with no cost to the property owner; however, all those funds have been allocated.

Q: Can a cluster system be used for an entire region? How many residences can be served by a cluster system?
A: Cluster systems cannot be used for an entire region. Cluster systems typically serve 2 to 16 residences.

Q: Could my house be placed on a cluster system and my neighbor be on their own OSTDS?
A: It is unlikely this situation would occur.

Q: What happens to cluster effluent?
A: The effluent discharges to the environment in the same manner as an OSTDS but the cluster system provides economies of scale and technology efficiencies that improve treatment.

Q: What does a cluster system involve?
A: A cluster system is similar to a traditional OSTDS with a septic tank and drainfield. However, the system will be larger to serve multiple homes and will be located on a separate parcel.

Q: Would using a cluster system allow for a smaller lot size?
A: The lot size is determined by zoning. By moving the OSTDS from a parcel to a separate location, this would allow use of more of the parcel.

Q: What is the size of a cluster system relative to the house size?
A: There is a table in the Task 2 report that provides this information. There is also a required buffer for the drainfield.

Q: Is a homeowner’s association necessary for a cluster system?
A: A homeowner's association, or some other joint authority, will likely be necessary to operate and maintain a cluster system.

Q: Are homeowners responsible to fund the sewer system lateral?
A: Homeowners may be responsible for funding the sewer system lateral. Depending on the funding mechanism, there may be funds to run the laterals.

The third in-person meeting on August 4, 2021 was attended by one person. The participant discussed the need for additional WWTFs, which would be a decision made by one of the utilities (City of Tallahassee or Talquin); use of sprayfields for effluent disposal; and stormwater treatment and flooding areas. The fourth in-person meeting on August 5, 2021 was also attended by one person who did not make any comments or ask questions.

For the Zoom meeting on August 17, 2021, the following questions and answers were discussed:

Q: Were you able to analyze information to the lot level? The people along Centerville on septic systems are interested in what will be required.
A: The initial approach was to review the data generally across the entire county. In Task 5, the data will be evaluated by individual areas and by parcels.

Q: I am concerned with the 65% nitrogen removal assumption for INRBs. The 65% reduction from the Hazen and Sawyer report is only for INRBs with pressure dosing and liners and, without these additions, INRBs may not achieve more reductions than a traditional OSTDS. FDOH was working to revise their rule to include INRBs with pressure dosing and liners but I have not seen the status of the revision. Given this history, why are you using a 65% reduction for INRBs in the study?
A: The 65% nitrogen reduction was provided by DEP and the FDOH rule is still in process. If data are provided that show that the percent reduction should be different, the report can be revised. Leon County is currently finalizing a memorandum of understanding with DEP to install two lined and dosed INRB systems, which will be monitored. The county is also monitoring several non-lined INRB systems. If the data show that the reduction should be something other than 65%, the geographic information system database created in this project will be revised.

Q: Does it make sense to proceed with a number that is not substantiated since DEP said not to apply a 65% nitrogen reduction to INRBs?
A: In our meetings DEP and FDOH, they indicated that 65% is an acceptable estimate at this time, until sampling indicates otherwise. The county has initiated sampling on several systems.

Q: I live in Centerville Trace and the county contacted me a few months ago to see if our neighborhood would be interested in central sewer. What is the status of the grant the county submitted for this project?
A: The county has not heard back from the state about the watershed protection grants. As soon as the county has an update, they will reach out to the residents in that area.

Q: In the Task 2 report, there is a discussion about the non-market costs and benefits approach, which includes a reduction in glass bottom boat usage at the spring due to nitrogen. There are no empirical data that show a connection between nitrogen pollution and decreased water clarity at the spring. Why was this used as an assumed relationship and where can I find the details on the calculation?
A: The calculation is partially included in Appendix H of the Task 2 report and additional details can be provided. The assumption is that the spring and water quality are affected by nitrogen per the BMAP. Nitrogen does have an impact on submerged aquatic vegetation, which ties into attractiveness of the spring for glass bottom boat tours. The impact on the cost from this item is not very big.

4.0 Appendix A. Public Comments Received and Responses

The following table includes the formal comments received during the public review period on tasks 1 through 3, as well as the response to either provide clarification or explain how the comment will be addressed in future project tasks.

Commenter	Task	Location	Comment	Response
FDOH/FDEP	1	Page 8, Section 1.2	A suggested addition to the literature is the Wakulla County Septic Tanks Study by Harden et al (2010) (https://floridadep.gov/dear/water-quality-evaluation-tmdl/documents/wakulla-county-septic-tank-study)	This report will be reviewed for potential inclusion in the literature for the final project report.
FDOH/FDEP	1	Page 9	Please clarify the concept of multiple OSTDS on a parcel. Usually, one OSTDS serves one built parcel. Figure 3 on Page 10 shows the Potential OSTDS density, in development units per acre, at build-out, in unincorporated Leon County. The concept of OSTDS density as the number of OSTDS per acre would make more sense than the number of OSTDS per parcel. To confirm, does the OSTDS density mean the number of parcels served with OSTDS per acre?	The evaluation focused on the potential OSTDS per acre of future allowable development density based on parcel zoning. This will be clarified in the final project report.
FDOH/FDEP	1	Page 9	Please clarify how higher density is expected to load more nitrogen to groundwater and surface water and make upgrades to AWTS more effective for smaller parcels (higher densities). Does this statement assume that there is a density-dependent attenuation factor that is not included in NSILT? The NSILT-approach does not include density in load assessments.	This statement does not assume another attenuation factor. This statement is noting that where there are a higher concentration of septic systems, there will be more nitrogen loading (per unit of area) since there are more systems contributing to the load.
FDOH/FDEP	1	Page 13	water table and ponding. Severely limited soil map units are classified as such based on assessed limited treatment in the soil (too sandy) or limited permeability of the soil (percs slowly) or high water table conditions (wetness). Some of these factors relate to treatment, some to hydraulic functioning. The classification is not related to the nitrogen treatment capability of the soil. For an assessment of nitrogen treatment of soil map units, see Otis' 2007 Task 2 report on the Wekiva Onsite Nitrogen Contribution Study (http://www.floridahealth.gov/environmental-health/onsite-sewage/research/_documents/wekiva-task2-final-report.pdf). This scoring component has little overall impact for the present study because Table 3 indicates that it was not used in the nitrogen reduction score and most of Leon County is rated as severely limited.	We will review the provided reference. The scoring in Table 3 uses the soil hydraulic conductivity.
FDOH/FDEP	1	Table 3, Page 22	calculated as the reciprocal of the upper boundary of the Range. For other input parameters, the upper boundary of the Range represents the condition of more nitrogen contribution. However, for the "Distance to Surface waters or wetlands" and the "Distance to Karst" input parameters, the upper boundary represents the condition of less nitrogen contribution. When adding the contribution from all input parameters, it appears that the contribution from land parcels located in larger distance to surface waters or wetlands and larger distance to Karst should be subtracted (effect of a negative sign) instead of being added to reflect that the parcels located in larger distance to surface water contribute less amount of nitrogen.	Some inputs influence the nitrogen reduction score more at a maximum value, and some influence the nitrogen reduction score more at a minimum value. For example, greater distance to karst will load less nitrogen to groundwater than lesser distance to karst. All inputs were then scaled.
FDOH/FDEP	1	Page 26	Comment throughout: we are unclear about where 90% reduction comes from with regard to NSF 245 testing, as the NSF 245 Standard does not reference this to our knowledge. Also throughout: PBTS are not required to be NSF certified (their performance level is generally based on innovative testing) and would need to be designed to meet 50% nitrogen reduction. See comments and suggested language below.	This language came from the FDOH handout "Nitrogen Reducing Systems for Areas Affected by the Florida Springs and Aquifer Protection Act" updated April 2020.
FDOH/FDEP	1	Page 26	ATU: There are at least two standards and there are several entities in addition to NSF that certify to the NSF standard. We believe what is intended here is : "….These systems must be certified to meet the National Sanitation Foundation (NSF) International/American National Standards Institute (ANSI) standard 245, which requires testing showing that on average at least 50% nitrogen reduction is achieved before (partially) treated wastewater is discharged to the drainfield…."	The definition will be updated for the final project report.
FDOH/FDEP	1	Page 26	PBTS: Comment: This seems closer to what is meant to replace the yellow-highlighted text: "….PBTSs designed to provide nitrogen reduction to meet springs BMAP requirements must be approved by the Department of Health and certified by the design engineer to be capable of providing, on average, at least 50% nitrogen reduction before partially treated wastewater is discharged to the drainfield…"	The definition will be updated for the final project report.
FDOH/FDEP	1	Page 26	INRB: Comment: Just for clarification, the 65% is the reduction from input through the drainfield and includes the biochemical attenuation factor.	The definition will be updated for the final project report.
FDOH/FDEP	1	Table 8	Table 8 includes a couple of what appear to be assumption errors: (1) The nitrogen reduction is calculated as "2020 nitrogen load from wastewater" - "updated nitrogen load". The 2020 nitrogen load from wastewater includes WWTF loads, while the updated nitrogen load only includes the successor load to OSTDS after upgrades and septic to sewer conversions. The updated nitrogen load is missing the original WWTF load. Therefore, the numbers are wrong and overestimate the nitrogen reduction.	The 2020 nitrogen load from wastewater is only from OSTDS, and does not include WWTFs.
FDOH/FDEP	1	Table 8	(2) The treatment effectiveness of upgraded OSTDS appears to be estimated as 65% before applying the biochemical attenuation factor. For ATUs and PBTS, this is slightly optimistic given the design value of 50% reduction. For the INRB the assumption of a treatment effectiveness including the biochemical attenuation factor of 82.5% is also more than the 65% usually estimated for this approach.	The calculations for nitrogen reduction were applied in a manner consistent with the FDEP approach in the BMAP, as confirmed with FDEP staff as part of preparing this report.
FDOH/FDEP	1	Table 8	(3) The "percent of total reduction per nitrogen reduction land area" appears to be calculated as "nitrogen reduction" divided by the "total nitrogen load" of Table 4. Given that the nitrogen reduction estimates are wrong and too high, the results are too high, as well.	Please see response to the comment above about the nitrogen reduction estimates.
FDOH/FDEP	1	Page 26	Please see earlier comment about ATUs and PBTSs. Proposed revision: Aerobic treatment units (ATUs) are a type of onsite sewage treatment and disposal system (OSTDS) that introduces air into the treatment of wastewater to help reduce organic pollutants and suspended particles. These systems must be certified to meet the National Sanitation Foundation (NSF) International/American National Standards Institute (ANSI) standard 245, which requires testing showing that on average at least 50% nitrogen reduction is achieved before (partially) treated wastewater is discharged to the drainfield.	The definition will be updated for the final project report.
FDOH/FDEP	1	Page 26	Proposed revision: PBTSs designed for springs protection must be approved by the Department of Health and certified by the design engineer to be capable of providing, on average, at least 50% nitrogen reduction before partially treated wastewater is discharged to the drainfield.	The definition will be updated for the final project report.
FDOH/FDEP	1	Page 30	Xueqing and Roeder listed as reference but not referred to	Noted.

Commenter	Task	Location	Comment	Response
FDOH/FDEP	2	v	Finding 4: Comment: in most cases a PBTS is not a cluster system but installed to serve a single establishment	Noted.
FDOH/FDEP	2	Page 2	Comment in general: the definitions here are different from the Task 1 report	The definitions will be updated for the final project report.
FDOH/FDEP	2	Page 2	INRB: Proposed revision: add something about expected performance as in task 1. Such as, The currently codified configuration for this type of system is estimated to reduce nitrogen in sewage by about 65%.	The definition will be updated for the final project report.
FDOH/FDEP	2	Page 2	Proposed revision: Aerobic treatment units (ATUs) is a type of onsite sewage treatment and disposal system (OSTDS) that introduces air into the wastewater facilitate treatment. ATUs frequently but not always include a blower or a pump to facilitate this. The aeration also converts ammonia in the wastewater into nitrate. A nitrogen-reducing ATU frequently includes some form of recirculation of aerated wastewater to remove nitrate from wastewater through denitrification.	The definition will be updated for the final project report.
FDOH/FDEP	2	Page 2	specific pollutants to a specific level. Structures and functions of PBTS can vary widely depending on the design goals. A nitrogen-reducing PBTS can sometimes include a nitrogen-reducing ATU and/or other components to remove nitrogen from the wastewater water.	The definition will be updated for the final project report.
FDOH/FDEP	2	Page 2	Cluster systems: Proposed revision: ....They may include traditional septic systems, INRBs, ATUs or PBTSs. Depending on the circumstances they could be permitted as either an OSTDS or WWTF	The definition will be updated for the final project report.
FDOH/FDEP	2	Page 3	Title for Section 1.2.1: Given that just about all of the analyzed options are categorized as OSTDS, use a more definitive term for this, such as Conventional Septic System. This also applies to 2.1.1, 2.2.1, 2.3.1, 2.4.1	The final report will clarify that these are traditional OSTDS.
FDOH/FDEP	2	Page 4	An INRB (Figure 3) is a passive upgrade to a conventional OSTDS. INRBs do not require electrical components for nitrogen treatment. Like a conventional system, however, a pump may still be needed if the drainfield is located higher than the septic tank. An INRB drainfield is a two-stage, passive biofilter based on nitrification in the first stage and denitrification in the second stage. OSTDS that employ a passive INRB drainfield can reduce the total nitrogen load by about 65%, which is higher than the nitrogen reduction of the drainfield in a conventional OSTDS which is estimated to remove 10-50% (50% per NSILT) of the wastewater nitrogen.	The definition will be updated for the final project report.
FDOH/FDEP	2	Page 5	Proposed revision: Per the Florida Department of Health, for an ATU product to be approved as a nitrogen-reducing ATU, it must meet and be certified to the NSF Standard 245, which requires testing showing that on average at least 50% nitrogen reduction is achieved before (partially) treated wastewater is discharged to the drainfield. All new construction of OSTDS with ATU need to have at least 24 inches separation between the bottom of the drainfield and the seasonal high water table. To meet springs protection BMAP requirements, for OSTDS repairs, if the required separation between the bottom of the drainfield and the seasonal high water table is less than 24 inches, the nitrogen-reducing ATU must be capable of reducing nitrogen by at least 65% before discharge to the drainfield. In contrast to performance based treatment system (PBTS), ATU systems with treatment capacity less than 1,500 gallons per day do not need to be designed by an engineer. But they need an operating permit from the DOH County Health Department and at least semi-annual inspections from a maintenance entity certified by the product manufacturer.	The definition will be updated for the final project report.
FDOH/FDEP	2	Page 6	Proposed revision: PBTS are less commonly used than ATUs. While typically active, involving aerators or multiple pumps, they could also be passive systems.........PBTSs must be designed by a professional engineer licensed in Florida and require a maintenance contract and operating permit from the county health department. The nitrogen-reducing PBTSs for springs protection must be approved by the Department of Health and certified by the design engineer to be capable of providing, on average, at least 50% nitrogen reduction before partially treated wastewater is discharged to the drainfield. All new construction of OSTDS with PBTS needs to have at least 24 inches separation between the bottom of the drainfield and the seasonal high water table. To meet springs protection BMAP requirements, for OSTDS repairs, if the required separation between the bottom of the drainfield and the seasonal high water table is less than 24 inches, the nitrogen-reducing PBTS must be capable of reducing nitrogen by at least 65% before discharge to the drainfield.	The definition will be updated for the final project report.
FDOH/FDEP	2	Page 10, Section 2.1.4	Of the described options, only PBTS require engineering, so it is unclear why there is no cost differential to a conventional septic system or INRB. ATUs can include drip irrigation, which also requires engineering.	The costs in this section focus on the permitting costs, which would be the same for each system that serves one home.
FDOH/FDEP	2	Page 11, Section 2.2.1	The code sizes are 900 gallon for a 300 gpd (3BR) house and 1050 gallons for a house with an estimated sewage flow exceeding 300 up to 400 gpd. Suggest to rephrase as: The typical cost of a conventional septic system for a 3 BR house	Noted. The cost presented is the average for a 1,000-gallon tank.
FDOH/FDEP	2	Page 12, Footnote 15	The Fuji Clean CEN is currently approved as an NSF 245 certified nitrogen reducing ATU. The Fuji Clean CE is currently approved as a PBTS based on performance data obtained in Florida. While both may provide greater reductions than the required minimum of 50% the reductions are not greater than approved by DOH. If the authors consider it necessary to emphasize the variation of performance between different treatment systems, we would suggest to rephrase as: 15 Fuji Clean CEN systems (as nitrogen reducing ATUs) and CE systems (as nitrogen reducing PBTS) provide greater rates of nitrogen reduction than the minimum required by the springs protection BMAPs and are more expensive for equivalent capacities"	Noted.
FDOH/FDEP	2	Page 19/20, Section 2.6.1	Please clarify the methodology for lifecycle vs O&M costs and how the assessment was consistent between the different technological solutions. Section 2.6.3 and 2.6.4 both give two different "total unit O&M costs" and "total system O&M costs" This discussion points to (1) the large uncertainty of the lifespan of a septic system (given current repair permitting rates of less than two percent, the life expectancy could be on the order of 50 years) and (2) that these costs include not just ongoing O&M but also replacement. It is unclear why a repair of a drainfield is going to be more expensive than the installation of a complete system discussed in 2.2.1	Noted. The sum of separable system components (tank, tank installation, pipes, pump if required, drainfield) is higher than that for an initial complete installation. Separable costs are relevant for O&M and lifecycle estimates. The lifecycle costs for tank replacement and drainfield replacement will be included in the revised estimates for OSTDS, ATU, PTBS, and INRB systems as part of the final report.

Commenter	Task	Location	Comment	Response
FDOH/FDEP	2	Page 20	The reading of the FOSNRS-report in Section 2.6.2 by the authors appears to include several misunderstandings. Table 6 reflects the operating, maintenance, repair and replacement expenses for INRB using the average costs estimated based on seven passive nitrogen-reducing systems constructed by DOH during the Florida Onsite Sewage Nitrogen Reduction Strategy (FOSNRS) study. Please note that, among these seven systems, system BHS-7 is the only inground nitrogen-reducing system. Other FOSNRS systems are either in-tank systems or hybrid systems that are permitted differently than the INRB system. The annual O& M (does not include the media replacement) for INRB should be similar to the conventional OSTDS. The long-term mean compliance cost for INRB are currently similar to that of a conventional OSTDS, i.e. no water quality sampling and operating permit are required. The annual O&M costs in Table 6 include annual inspection and maintenance as if these INRB were aerobic treatment units or PBTS, which they are currently not. Please note that in the FOSNRS report, a life-cycle period of 30 years is assumed, and that replacement of media for in-ground INRB is assumed to be needed every 30 years, so media replacement does not show up in replacement costs. By using completely separate estimating methods for a conventional septic system and an INRB, it is unlikely that the incremental additional costs of an INRB are accurately reflected. For example the conventional septic system cost estimate includes costs for a drainfield replacement, the INRB does not.	Noted. Disparities between the FOSNRS report and this analysis will be clarified in the final report to the extent the former document does not include elements of annuitized O&M, such as drainfield replacement.
FDOH/FDEP	2	Section 2.6.3 (and similar Section 2.6.4)	Please clarify, what are lifecycle costs in this context? Apparently not annualized installation , engineering design and permitting or compliance costs. Is it an average replacement cost for parts?	Installation, engineering, and permitting are addressed in prior portions of Section 2.6. Lifecycle costs will be amended, as appropriate, for any system elements not specifically addressed, and where different from those for conventional OSTDS.
FDOH/FDEP	2	Page 22, Section 3.2	Please clarify how the costs in Appendix H relate to the estimates derived in section 2	Appendix H uses in the information presented in Section 2 to determine a benefit-cost analysis for each option.
FDOH/FDEP	2	Page 23	Appendix H includes as direct benefit apparently the avoided treatment costs to achieve the same nitrogen removal with stormwater treatment. It seems this comparison would be clearer if the costs per nitrogen removed would be compared between wastewater treatment and stormwater treatment ($541/kg). Given the quantity of nitrogen that is supposed to be removed, it seems unlikely that this could be achieved with stormwater treatment at all, and not at a constant price.	Agree. The focus is OSTDS to meet the required nitrogen reductions.
FDOH/FDEP	2	Table 8, Section 3.3	We believe there are several issues with this table: 1. The nitrogen-reducing efficiency numbers listed in the "Additional Treatment Relative to Base" column are much higher than what are shown on the lists of approved nitrogen-reducing ATU and PBTS. The list of nitrogen-reducing ATUs approved in Florida and their nitrogen-reducing efficiencies can be found at http://www.floridahealth.gov/environmental-health/onsite-sewage/products/_documents/245cert-atu-18.pdf. The list of nitrogen-reducing PBTSs approved in Florida and their nitrogen-reducing efficiencies can be found at http://www.floridahealth.gov/environmental-health/onsite-sewage/products/_documents/npbts-components.pdf. Using the nitrogen-reducing efficiency numbers included in these documents, the mean nitrogen-reducing efficiencies for ATU and PBTS are about 63% and 67%, respectively, before discharge to the drainfield. Assuming 50% of the remaining portion of the nitrogen will be removed by the drainfield, the mean total nitrogen-reducing efficiencies for ATU-drainfield and PBTS-drainfield will be 74% and 77%, respectively. Please note that the 74% and 77% are the TOTAL treatment efficiencies from ATU-drainfield and PBTS-drainfield. They provide 24% (ATU-drainfield) and 27% (PBTS-drainfield) more nitrogen-removal than the conventional OSTDSs if we assume the OSTDS base is 50%.	The efficiencies were applied in the same manner as FDEP used for the BMAP, as confirmed with FDEP staff during report development.
FDOH/FDEP	2	Table 8, Section 3.3	2. The same issue applies to the INRB too. The 65% nitrogen-reducing efficiency is the TOTAL nitrogen treatment. The INRB provides about 15% more nitrogen-removal than the conventional OSTDS if we assume the OSTDS base is 50%.	The efficiencies were applied in the same manner as FDEP used for the BMAP, as confirmed with FDEP staff during report development.
FDOH/FDEP	2	Table 8, Section 3.3	3. Once the numbers in this table are corrected, Tables 9, 10, and 11 need to be updated.	The efficiencies were applied in the same manner as FDEP used for the BMAP, as confirmed with FDEP staff during report development.
FDOH/FDEP	2	Table 8, Section 3.3	4. Central sewer treatment effectiveness only applies to the City of Tallahassee not to Talquin.	Correct.
FDOH/FDEP	2	Table 8, Section 3.3	Comment on the base case: The analysis is based on total treatment rather than additional treatment relative to base. In this way it appears to assume that installing conventional OSTDS is already more than a baseline option. Rather than comparing incremental costs to incremental benefits relative to conventional OSTDS, the analysis compares cost effectiveness of conventional OSTDS to that of higher treatment option as if there was a no-treatment or direct injection option. Is that the same approach used for other treatment approaches?	A traditional OSTDS does have some nutrient removal benefits and the total benefits of the other options are compared to the total benefits of a traditional OSTDS.
FDOH/FDEP	2	Page 25	Table 11 contrasts "Cluster (Passive)" and "Cluster (Active)" while Table 10 lists Cluster systems in terms of previously discussed categories (INRB, ATU, PBTS). Please make consistent.	Noted.
FDOH/FDEP	2	Page 29	Comment on Appendix A NSF standard 245 (nitrogen-reducing) certified aerobic treatment units in Florida (Rule 64E-6.012, F.A.C.). This table is not the most up to date nitrogen-reducing ATU list. The most update list can be found from http://www.floridahealth.gov/environmental-health/onsite-sewage/products/_documents/245cert-atu-18.pdf.	The appendix reflects the latest available table at the time of report drafting.
FDOH/FDEP	3	Page 2	See comments in previous task reports on clarifications for the definitions.	The definitions will be updated for the final project report.

Commenter	Task	Location	Comment	Response
FDOH/FDEP	3	Page 11, Section 2.2.1	INRB cons for depth: Generally agreed, somewhat unclear why typical installations are so deep, but that may be due to local construction practices. For new systems, maximum drainfield surface depth is 30 inches, the two layers together are another 30 inches, and then another six inches to the water table are required, for a total of 5.5 feet to the water table. Minimum requirement on the seasonal high water table is 36 inches below the existing grade, not 7 feet. The system does also need at least 36 inches of slightly limited soil below the existing grade. In new systems and some repairs at least another 6 inches of slightly or moderately limited soil below the 36 inches slightly limited soil are required to meet effective soil depth requirements. The system footprint area cannot be excavated to overcome soil conditions. Mounds with the bottom of the drainfield at grade are acceptable, but drainfield cannot be lifted further to overcome unacceptable soil conditions or a water table that is too shallow.	Noted. This information will be considered as specific areas of the county are evaluated for applicability of different technologies.
FDOH/FDEP	3	Page 11, Section 2.2.1	INRB cons for reductions: This aligns with the previous comments on task 2 table 8 effectiveness estimates. The INRB effectiveness includes the drainfield effectiveness (or biochemical attenuation factor in NSILT).	Noted. The efficiencies were applied in the same manner as FDEP used for the BMAP, as confirmed with FDEP staff during report development.
FDOH/FDEP	3	Page 17	National Sanitation Foundation (NSF) International/American National Standards Institute (ANSI) standard 245, which requires testing showing that on average at least 50% nitrogen reduction is achieved before (partially) treated wastewater is discharged to the drainfield. Same nitrogen treatment level also applies to the nitrogen-reducing PBTS except that the PBTS must be approved by Florida Department of Health and certified by a professional engineer licensed in Florida. Construction for all new OSTDS with either ATU or PBTS must have at least 24 inches separation between the bottom of the drainfield and the seasonal high water table. To meet springs protection BMAP requirements, for repaired OSTDS, if the required water table separation is less than 24 inches, the nitrogen-reducing ATU or PBTS must be capable of reducing nitrogen by at least 65% before discharge to the drainfield.	The definitions will be updated for the final project report.
Dorothy McPherson	Tasks 1-3	N/A	Microphones would be nice.	Microphones were used in subsequent meetings, and will be used during the next round of public meetings.
Dorothy McPherson	Tasks 1-3	N/A	Are, or why aren't, studies being included that tell how much farming and other industries in other Florida counties (Liberty, Gadsden, Gulf, Franklin) and in Georgia affect the nitrogen content in the Ochlocknee Basin as well as Wakulla Basin, and any other basins that are relevant to the study.	The Comprehensive Wastewater Treatment Facilities Plan is being developed to address a FDEP requirement. FDEP evaluated nitrogen loading from a variety of sources within the Upper Wakulla River and Wakulla Spring basin, and determined that septic systems are the largest source. FDEP required that each local government prepare a remediation plan for septic systems, and this will be Leon County's plan.
Dorothy McPherson	Tasks 1-3	N/A	Our folks out Highway 20 need to know when they can expect any actions that will affect them financially and how as this is and shall affect the Wakulla Basin and its residents.	Agree. Another round of public meetings will be held before the plan is finalized and the county will coordinate with residents as plan components move forward.
Deborah McKee	Tasks 1-3	N/A	I would like to know if the County is monitoring and enforcing nitrogen released when people disconnect washers from septic systems, which is common in rural areas, as well as people who do not properly dispose of trash and hazardous waste. I think there should be a large effort in rural areas to inform people of the dangers to the water system as well as environment, with fines imposed for disregard.	Need County input on response
Robert Deyle	Task 2	Page 23	diminished tourism, as measured by changes in water clarity at Wakulla Spring (measured here by the use of glass-bottom boats)." As I said at the public meeting on 8/17/21, so far as I know, no one has proffered a scientifically-based hypothesis for a link between nitrate levels at Wakulla Spring and dark water conditions. The research that Sean McGlynn conducted for WSA demonstrated that dark water conditions are caused by various combinations of tannins and chlorophyll discharged through the vent into the spring. There is no evidence of any significant contribution from algae growing in the spring bowl since turbidity is not a statistically significant independent variable when tested against visibility depth. See http://wakullaspringsalliance.org/wp-content/uploads/2021/01/Why-is-the-Water-Dark.Part-I.WSA_.11-20-20.pdf and http://wakullaspringsalliance.org/wp-content/uploads/2021/01/Why-is-the-Water-Dark.Part-II.WSA_.12-18-20.pdf on the WSA website.	The assumption is that the spring and water quality are affected by nitrogen per the BMAP. Nitrogen does have an impact on submerged aquatic vegetation, which ties into attractiveness of the spring for glass bottom boat tours. The impact on the cost from this item is not very big.
Robert Deyle	Task 2	Page 23	I've identified four forcing functions that may be contributing to increasing frequency and duration of tannic inflows some of which also may be bringing additional chlorophyll into the spring as well: (1) More Frequent Lost Creek Flows to Wakulla Spring, (2) Accelerating sea level rise and head gradients, (3) Changes in rainfall patterns, and (4) Declining spring pool stage (head). See http://wakullaspringsalliance.org/wp-content/uploads/2016/11/Why-is-the-Water-Dark.Part-III.WSA_.Feb-2021.Deyle_.pdf and http://wakullaspringsalliance.org/wp-content/uploads/2016/11/Declining-Stage-Implications-for-Dark-Water-and-MFL.WSA_.Mar-2021.Deyle_.pdf on the WSA website.	Noted. The focus of this study is on reducing nitrogen to meet the BMAP requirements.
Robert Deyle	Task 2	Page 23	The principal impacts of excessive nitrogen are to the ecosystem, but it's hard to unravel the direct effects from other perturbations. Excess nitrogen promoted the proliferation of the hydrilla after its arrival in 1997 and contributed to the subsequent proliferation of algal mats following the herbicide treatments that facilitated algal colonization of habitat freed by loss of both hydrilla and native SAV. But the herbicide treatments had direct effects as well as did the arrival of the manatee. On top of that we now have declining river stage associated with ongoing stream channel erosion as well as increasingly larger and more frequent salinity spikes. Excess nitrogen also has resulted in heavy periphyton colonization of SAV leaves possibly resulting in lower productivity. The most readily observed proxy that I can think of is the decline in total animal abundance documented with data from the park's wildlife monitoring program started in 1992 and continuing today. It may be possible to construct a statistical causal model of nitrate levels and animal abundance. I haven't tried. There might then be a way to attach a value to the wildlife and/or the hedonic value of observing the wildlife.	Noted. The focus of this study is on reducing nitrogen to meet the BMAP requirements.

Commenter	Task	Location	Comment	Response
Jim Cheng	All	N/A	This is Jim from JDL Global Environmental Protection, which is specializing in municipal wastewater treatment based on FMBR (Facultative Membrane Bio-reactor) technology. I am looking for cooperation with Leon County for this potential wastewater treatment project. FMBR technology is a novel biological wastewater treatment process that removes carbon, nitrogen, and phosphorus simultaneously in a single reactor. It has a low capital cost, saves energy, and meets stringent nutrient discharge requirements with simple controls. We have a pilot project at the Plymouth Municipal Airport in Massachusetts that started in October 2019 and the MassCEC has posted the Plymouth FMBR study report on their website under Success Stories and Final Reports: https://www.masscec.com/water-innovation. It saves more than 70% energy cost compared with the original SBR system. I have attached a brochure to highlight what we do and how we can provide wastewater treatment solutions for you. If you would be interested in further information, I would be happy to schedule a Zoom meeting to discuss our technology and solution. We are also available to visit you on-site if you are convenient.	Thank you for sending information on your technology. The CWTFP focuses on technologies approved by FDOH and FDEP for use in Florida.
Robert Deyle	Task 3	N/A	Site-specific factors that should not be used to assess the different technologies independent of site context include the following: (1) site proximity to PFA and PFA2, (2) site proximity to USA, (3) adjacent land availability for cluster systems, (4) density of existing development and future land use, (5) impact to existing and future land use density, (6) existing WWTF capacity, (7) proximity to centralized wastewater collection system, (8) local comprehensive plan direction for wastewater treatment. These should be properly described and weighted in section 2 and should be applied in Task 5. Here I am offering comments on several of these factors for which I believe the characterization and/or scoring are problematic.	This factors in the matrix are being applied to site-specific areas of the county as part of Task 5.
Robert Deyle	Task 3	N/A	Site proximity to PFA and PSPZ: No rationale is offered for determining that site proximity to PFA and PSPZ is not applicable or neutral for cluster systems. This factor will be equally important for ranking sites regardless of the technology used in a cluster system. When site-specific assessments of technologies are conducted in Task 5, this factor should be split into two separate factors based on site location within or without of the area rather than proximity. There is no basis in the methodologies used to define the PFA or the PSPZ to justify rating sites outside one of these zones as being situated on more or less vulnerable substrates based solely on distance from the zone boundary. The BMAP has assigned greater ground water vulnerability to nitrogen pollution to areas within the PFA. Therefore areas outside the PFA but within the county' PSPZ should be scored lower than areas within the PFA.	Noted. The final assessment and report will be broken out to areas within the PFA/PSPZ and areas outside as there are additional requirements for OSTDS within the PFA/PSPZ.
Robert Deyle	Task 3	N/A	Site Proximity to USA: A similar criticism applies to this factor. Given current land use policies and regulations, the criterion is location within or outside the USA. Sites outside the USA are no more appropriate for central sewer if they are closer to the USA boundary. Again the scoring for cluster systems is unclear and not explained. Why is it not scored as "not applicable"?	This factor focused on proximity to the USA for connection to central sewer, which is why cluster systems were scored as not applicable.
Robert Deyle	Task 3	N/A	Density of Existing Development and Future Land Use: The treatment of this factor is inside-out. The issue is not the relative merits of higher versus lower density, it is the extent to which existing and planned densities favor central sewer versus cluster systems, versus onsite systems. Unit costs favor higher densities for central sewer. Cluster systems require some minimum localized densities to be cost-effective. Onsite systems will be more cost-effective when densities are too low for either central sewer or cluster.	Correct. This is the logic that was applied to this factor which is why density was rated as a pro for central sewer and cluster systems. This can be clarified in Task 5.
Robert Deyle	Task 3	N/A	Impact to Existing and Future Land Use Density: The treatment of this factor is a muddled morass that misses the point. This was one of the primary issues raised by Pam Hall and others in arguments against extending central sewer to Woodville, i.e. doing so would create pressure to densify land use in areas adjacent to the new trunk sewer. This factor therefore is site-specific. The factor description in section 2.6 does not offer any clear factor description. The term "house density" is a misnomer for household size and has nothing to do with this issue. Housing density is separately accounted for in section 2.5. The other demographic variables described also have nothing to do with this issue.	Noted. The use of this factor will be clarified in Task 5.
Robert Deyle	Task 3	N/A	Existing Wastewater Treatment Facility Available Capacity: The assessment of this factor entirely misses the point of this site-specific criterion. What needs to be assessed is whether there is adequate capacity at a WWTF to which existing onsite systems or future development in any given location can feasibly be connected. This factor must be considered in concert with location inside or outside of the USA and proximity to centralized wastewater collection system. Summing all of the WWTF capacity in the county and comparing that to all of the wastewater that would be produced from existing and future OSTDS provides no useful information.	This site-specific evaluation will be conducted as part of Task 5, when locations are identified for potential connection to central sewer.
Robert Deyle	Task 3	N/A	Local Comprehensive Plan Direction for Wastewater: The pertinent policies described in section 2.14 are those that address when, where, and/or how different technologies are applied. The policies described concerning OSTDS, and by extension, ATU, PBTS, and INRB, are all site-specific having to do with lot size and location within special planning areas, e.g. floodplains, the Lake Jackson Special Development Zone and the PSPZ. Inexplicably Table 8 designates the local comprehensive plan direction for wastewater factor as inapplicable or neutral for these technologies. The comp plan policies described for central sewer are likewise site-specific. Comp plan policy 1.3.1 governing cluster systems is both site-specific and technology-specific. It is site-specific because it essentially limits the use of cluster systems to the BMAP PFA. That policy should be treated as a 0/1 filter criterion in Task 5, i.e. cluster systems are ruled out entirely except within the PFA. It may, however, be desirable to amend that policy to differentiate between traditional OSTDS cluster systems and AWTS cluster systems. The clause that restricts the application of cluster systems to "that necessary to serve development existing on or prior to February 1, 1990" is a technology-specific constraint that also should be remedied with a comp plan amendment that differentiates between traditional OSTDS cluster systems and AWTS cluster systems. Comp plan policy 4.2.5 stands out as one that is technology-specific, requiring that a traditional OSTDS be upgraded to a performance-based OSTDS when the OSTDS fails. If applied to a comparison of technologies, this policy should be scored favorably for PBTS, but probably the policy also ought to be amended to encompass ATUs and INRBs.	The comp plan components are being considered site-specifically as part of Task 5.

Commenter	Task	Location	Comment	Response
Robert Deyle	Task 3	N/A	Other factors described in section 2 are technology-specific and may offer a useful comparison independent of site context. However, two of the technology-specific factors are already addressed with specific costs in Task 2 and should not be accounted for again in Task 3: (1) right-of-way/easement and (2) state rules on septic system permit requirements. Right-of-way/easement acquisition costs for cluster systems are explicitly accounted for in Task 2 sec 2.5.5. In the discussion of central sewer in Task 2 section 2.5.6, the text states that "In most situations, additional easement and ROW acquisition is not required for the installation of a central sewer system" so this factor should not be included in Task 3 for the sewer option either. Task 2 sections 2.1 – 2.3 account for the cost implications of applicable state permitting requirements and design standards.	The costs for rights-of-way and easements are included in Task 2 but the location of these must be considered when evaluating locations to place technologies. The same applies for the septic permit requirements, which may limit locations of certain technologies (if there is not enough groundwater separation, for instance).
Robert Deyle	Task 3	N/A	Scalability of Technology: The treatment of this factor is off the mark. "Scalability is the property of a system to handle a growing amount of work by adding resources to the system" (https://en.wikipedia.org/wiki/Scalability). It is a term used most often in IT. As applied in this context it refers to the ability of a wastewater treatment technology to scale-up to meet additional demand. It only applies to cluster systems and centralized sewer and needs to be differentiated from capacity per se.	Noted. This can be clarified in the Task 5 report.
Robert Deyle	Task 3	N/A	Technology Performance History: The characterization of this factor is a clutter of irrelevant factors that goes way beyond the simple issue of performance history. Furthermore, the complete factor description includes the qualifier "in similar site conditions." Thus this factor also should be site-specific. Because it could be assessed independent of site conditions, it also could be treated a strictly technology-specific factor. Doing so leaves the following as appropriate for the sort of analysis presented in section 3: (1) technology performance history, (2) suitability of retrofit, (3) suitability to new development, (4) anticipated property owner participation, and (5) time required for implementation.	This factor is being considered in site-specific locations as part of Task 5.
Robert Deyle	Task 3	N/A	To be useful, the descriptions of these factors should explain the basis for assigning factor scores of 1 or 2. The logic is not evident for many of the scores presented in Table 8. Specific issues regarding the technology-specific factors follow.	Noted. This can be clarified in the Task 5 report.
Robert Deyle	Task 3	N/A	I would argue that the "not applicable/neutral" scoring of INRBs for "technology performance history" should be changed to a 1 since INRBs have no performance history and the absence of such history is a liability. We have no monitoring data for the stripped-down version that lacks pressure dosing and a liner. If changed to 1 the weighted mean score for INRBs would be 1.77.	Noted.
Robert Deyle	Task 3	N/A	It's unclear why Table 8 scores "anticipated property owner participation" as "not applicable/neutral" for cluster systems. Perhaps that is because the consultant has assumed that it might be less than that for onsite systems and better than that for sewer and hence is neutral. However, sources I have read suggest that acceptance may be even lower for cluster systems because of the ongoing maintenance requirements. If that were the case, this factor should be scored as a 1 and the weighted mean for cluster systems would be reduced to 1.20. Regardless, the rationale for this scoring should be explained.	Noted. This can be considered in Task 5.
Robert Deyle	Task 3	N/A	It's also unclear why Table 8 scores "time required for implementation" as "not applicable/neutral" for ATUs. The "time in months to design, permit, and construct" for ATUs reported in Table 6 is the same as that for PBTS, so presumably this factor should be scored as a 2. The resulting weighted mean score remains 2.00 with this correction.	Noted. This can be clarified in the Task 5 report.