Gramling, Alex

From: Amanda Case <acase@turnipseed.com>
Sent: Monday, April 22, 2024 11:35 AM
To: Gramling, Alex
Cc: David Tyre; levydmoore@yahoo.com
Subject: City of Franklin Springs, Sewerage System Improvements, Project No. 232651
Attachments: 2024-04-22 Transmit Antideg to EPD.pdf; City of Franklin Springs, Antideg Report, Project No. 232651.pdf

Good afternoon Mr. Gramling,

Please find attached a copy of our letter dated today along with supporting document on subject project. If you have any questions or would like a printed copy, please call us.

Thank you,

Amanda Case

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TURNIPSEED ENGINEERS

ATLANTA
AUGUSTA
ST. SIMONS ISLAND

April 22, 2024

Mr. Alex Gramling
Georgia Environmental Protection Division
Watershed Protection Branch
2 Martin Luther King, Jr. Drive, SW
Suite 1462 East Tower
Atlanta, Georgia 30334

Re: City of Franklin Springs
Sewerage System Improvements
Project No. 232651

Dear Mr. Gramling:

We are enclosing a copy of the Antidegradation Analysis for the City of Franklin Springs proposed sewerage system improvements for your review and approval on subject project. In response to your letter dated February 29, 2024, we offer the following:

1. Population & Flow Projections
    a. Residential flows have been updated using actual flow generated within the City's service area. Flow projections have been revised.
    b. Documentation of industrial flow use are provided in the Appendix.
2. Land Disposal Treatment System Alternative
    a. LAS acreage has been updated based on a new flow and 1.6in/week application rate.
    b. Recent land sales of large parcels in Franklin County have been provided in the Appendix. The price per acre has been updated.
    c. A complete cost estimate and map have been provided in the Appendix.
3. The report has been revised to state that the "no increase in pollutant loading" alternative is not applicable.

4. Treatment System Design and Selected Technology
    a. Other technologies have been described in Section 2.2.E.
    b. A simplified plant flow diagram has been provided in the Appendix.
5. The certification has been signed by the City's representative.

If you have any questions or need additional information, please call us.

Yours truly,

W. David Tyre, P.E.

WDT:ac
Enclosure
cc: Mayor Levy Moore

National Pollutant Discharge Elimination System (NPDES)

Domestic Antidegradation Analysis

Section 1. Project Information

Project Type: ✔ New Facility ☐ Expansion of Permitted Facility ☐ Other (Explain with attachment)

Facility Name: City of Franklin Springs Water Pollution Control Plant	**NPDES Permit Number:** N/A (not an exist. plant)
Location: Franklin Springs, GA	**County:** Franklin County

Receiving Waters Impacted: North Fork Broad River

Stream Classification: ✔ Drinking Water ☐ Recreation ☐ Wild River ☐ Scenic River ☐ Coastal Fishing ✔ Fishing, Propagation of Fish, Shellfish, Game and Other Aquatic Life

Section 2.1 Alternatives Analysis - Provide the alternatives considered that could prevent degradation of surface waters

A. Discharge to other treatment systems:

Existing sewer lines within a five mile radius must be identified. A preliminary indication of flow acceptance from the existing sewer system must be provided. If the existing system will not agree to accept the wastewater, include a letter documenting this. If the existing system will accept the wastewater, determine the transportation cost, tap-on fees to connect, and per gallon costs. Consider the option of discharging to an industrial pretreatment to a publicly owned treatment works (POTW), other POTWs, privately owned treatment system(s), or opportunities for industrial co- location should be explored including the feasibilities of implementation and the financial costs. Co-location may provide opportunities for discharge to existing industrial wastewater treatment systems, or source water substitution.

The City of Franklin Springs, the City of Royston and Franklin County provide sewage treatment within Franklin County. The City of Royston has recently upgraded its WPCP and infrastructure, however, the receiving stream, Hannah Creek, will not have capacity for the increase in biological phosphorus that would result from accepting the Franklin Springs facility's wastewater. The City of Royston WPCP is permitted at 0.5 MGD, and will not have capacity for the Franklin Springs future flow. Franklin County's WPCP, which is permitted at 0.3 MGD, also does not have available capacity.

B. 100% Reuse & 100% Recycle:

Discuss the potential of 100% year round urban water reuse and use of a 100% recycle system. Outline potential reuse customers &/or ways to recycle all of the generated wastewater. Provide feasibility and costs.

The City of Franklin Springs currently has no reuse customers; however, Highland Walk Golf Course could be a potential future customer. The proposed 1.5 MGD mechanical plant could be upgraded to provide advanced wastewater treatment capable of producing an effluent that meets reuse standards. Additional treatment processes will however need to be constructed at additional costs, including a chlorination system. Reuse distribution lines and a holding tank at the recipient's location will also need to be constructed. Even with the additional improvements, the demand for reuse water will be less than treatment plant effluent, especially in winter months. Therefore, due to the additional capital costs, reuse of treated effluent as the sole means of disposal is not considered a feasible option.

C. Land Disposal Treatment System:

Land treatment includes subsurface, drip irrigation, reuse and spray irrigation systems. Consideration should be given to the wastewater characteristics and whether the constituents are conducive to land application. Provide the following:

1. An estimate of the best case hydraulic loading rate based on County Soil Surveys or from a soil evaluation performed by a soil scientist. Acreage requirements may be driven by either hydraulics or agronomics.
2. Calculations showing hydraulic loading rate and total area of land needed for the land disposal system, including buffers.
3. The availability and cost of land and the cost of transporting the wastewater to a suitable, available site.
4. Overall feasibility and cost of use of land treatment.

The City of Franklin Springs would require approximately 391 acres of land to operate a land application site. Calculations are provided in the Appendix. There are no properties large enough in Franklin County or nearby in Madison County to host a site. Combining several parcels together is also not a feasible option. There are few large parcels around Franklin Springs, and a land application site would require many owners to sell their land. The estimated cost for purchasing the parcels would be $3,000,000 based on recent purchases in Franklin County with an average sale price of $7,622 per acre. Recent land purchases can be found in the Appendix. The purchase would require multiple separate property owners to sell properties that are not currently for sale. Data generated using the NRCS web soil survey in radius of 6 mi around Franklin Springs show poor soil for slow rate wastewater treatment. also shows 77% of the land in the region to be considered “very limited” for slow rate treatment of wastewater, and 23% of the land to be “somewhat limited” or “null or not rated”. The soil that is “somewhat limited” is mostly in the developed City of Royston, or in thin strips of land along roads and rivers. The soil characteristics are included in the Appendix. Only one location consisting of three properties has been identified as a potential location for the application site. A NRCS web soil survey was created for this site which shows 90% of the area as “Very limited” for slow rate treatment of wastwater and 10% as “somewhat limited”. For these reasons, a land application site is not considered feasible for wastewater disposal.

D. No Increase In Pollutant Loading:

Expanding systems only - Evaluate the installation of a wastewater treatment system resulting in no increase in pollutant loading to the surface waters.

Not Applicable

Section 2.2 Alternatives Analysis - Provide the alternatives considered that could lessen degradation to surface waters

E. Treatment system design and selected technology:

Provide the preliminary treatment system design for a direct discharge and selected technology/technologies to meet the wasteload allocation (WLA). Describe each candidate technology including the efficiency and reliability in pollutant removal and the capital and operational costs to implement those candidate technologies. Justify the selection of the proposed treatment technology. Provide feasibility and costs.

Franklin Springs' proposed direct discharge is planned in conjunction with the construction of a 1.5 MGD mechanical treatment plant. The discharge will be to North Fork Broad River. The proposed mechanical plant is designed to meet permit limits with proper operation. The City evaluated capital expenses, utility cost and operator flexibility when selecting from the Orbal process, the Carrousel process, sequencing batch reactors and sequencing / oxidation process using diffused air. The Carrousel oxidation ditch process was selected. Consistent effluent quality can be achieved with total nitrogen levels less than 2 mg/L and total phosphorus levels less than 0.3 mg/L. The process is energy efficient and has low operating and maintenance costs. The capital cost to construct this treatment system is approximately $32,443,280 and will require nearly $257,207 each year to operate and maintain the facility.

F. Flow minimization

Evaluate potential water conservation opportunities (partial recycling, reuse opportunities of wastewater, &/or infiltration/inflow (I/I) reduction measures for expansions of domestic wastewater facilities) including the feasibility of implementation and the costs. Indicate which of these may be implemented.

Included in the the Appendix is Franklin Springs WPCP Flow and Rainfall Figure. The graph shows the relationship between rainfall and average daily flow each month from July 2020 to August 2023. Increases in flow due to rain events are significant. The City is considering projects to minimize I&I flow. On site, reuse water will be used for some process and cleanup demands that would otherwise use potable water. A reuse pump station will be included in the construction budget.

Section 3. Social or Economic Demonstration

A. Regional Water Plan Projections:

If a wastewater point source discharge is specifically identified in an applicable Regional Water Plan (i.e., developed by a Regional Water Planning Council or Metropolitan North Georgia Water Planning District), absent sufficient evidence to the contrary, it will be presumed necessary to accommodate important social or economic development due to the extensive multi-jurisdictional planning and review process, including public participation, required before approval of these plans. If the proposed flow and location are not specifically addressed and supported by an applicable plan, Part 3.B. below should be completed instead.

Not Applicable.

B. Facilities Not in a Regional Plan:

1. **Population Projections -** Determine the population to be served within the service area using a 20-year planning period. If 20-year population projections for the project area are not available, a linear extrapolation of population trends from the past decade should be used. Any deviation from a linear projection method should be clearly justified. Support should be provided for the proposed population projection.

The Franklin County WPCP influent flow rate has seen a growth rate of 9% from 2021 to 2022. Historic growth rates for the county have been above 1%. This increase is in part due to Emmanuel College, located in Franklin Springs, planning on increasing enrollment from 900 to 1,500 students. Tables showing the population projections are shown in the Appendix.

2. **Flow Projections -** Justification of flow using population projections, as well as a demonstration of need, shall be provided. Flow projections shall represent the projected average flows since the permit flow is based on the monthly average. Consider the following:
   a. Current flow for proposed expansions. Current flows including residential, commercial, industrial, and non-excessive infiltration/inflow (I/I) based on actual flow data or water billing records must be provided. If the existing I/I is excessive, rehabilitation shall be addressed prior to any request for flow expansion. (Excessive I/I is considered to be a rate for domestic wastewater plus infiltration exceeding 120 gpd/capita during high groundwater or a total flow rate exceeding 275 gpcd during storm events. 40 CFR 35.2120)
   b. Future 20-year residential flow based on project growth.
   c. Future 20-year commercial flow based on project growth
   d. Future industrial flow. Flow for future industrial contributions must be provided. A reasonable allowance for undocumented industrial expansions may be included if the basis is clearly justified and current land-use plans and local zoning include it.
   e. Future Non-excessive I/I - A nominal allowance for non-excessive I/I for new sewer lines may be considered if the basis is clearly justified.

Several industries are seeking to construct facilities in Franklin Springs, pending available sewage treatment capacity. Documentation provided in the Appendix shows an expected industrial demand of 1.2 MGD, which is more than the existing pond system can accept.

Based on Office of Planning and Budget projections, Franklin County will grow at only 1% per year. From 2021 to 2022, the County experienced an increase influent to the treatment plant of 9%. Population for the City of Franklin Springs is projected based on the county growth rates determined by OPB. Historic values for gpd/capita have been up to 86 gpd/capita for an average year. The highest value for a given month in that year, March 2020, was 110 gpd/capita. Since this is not excessive I/I and because overtimse, pipes may become damaged and the sewerage network will grow, a 110 gpd/capita was used with the population projectections used. This growth rate will translate into a future residential flow of approximately 0.2 MGD.

The City proposes to use the remaining capacity, as well as the large tract of land on which the proposed plant will be built, to attract additional industry, with an additional allowance of 0.1 MGD.

To meet the projected demand and additional industrial growth, the City is seeking to construct a mechanical plant to increase treatment capacity from 0.1 MGD to 1.5 MGD. The City currently uses an aerated pond treatment system that discharges into an unnamed tributary to North Fork Broad River. This existing facility will be used as emergency storage.

C. Economic Analysis

Compare feasibility and costs of proposed treatment with the feasibility and costs of alternative or enhanced treatment technologies that may result in more complete pollutant removal.

To provide valid cost comparisons among all technologically possible wastewater alternatives identified above and the proposed discharge project, a 20-year Present Worth analysis should be performed. The analysis should include all monetary costs associated with construction, startup, and annual operation and maintenance of a facility. All unit cost information should be provided, and costs should be supported (e.g., vendor quotes, realtor land quotes, past bids, Means Construction Index, etc.) and submitted. For each treatment alternative identified as technologically possible and the proposed discharge project, costs should include, but not be limited to, the following:

1. Capital Costs
   a. Land acquisition
   b. Equipment
   c. Construction
   d. Design

2. Recurring Costs
   a. Operation and maintenance
   b. Equipment replacement
   c. Laboratory for permit compliance and process control
   d. Operator and support staff
   e. Sludge disposal
   f. Utilities

3. Present Worth Calculation

The following standard formula for computing the present worth should be used in all cost estimates made under this evaluation:

$$PV = Co + C \{[(1+r)^n - 1]/[r(1+r)^n]\}$$

Where:

PV = Present value of costs
C_o = Costs incurred in the present year = Capital costs
C = Costs incurred annually = Recurring costs
n = Life of the facility = Typically 20 years
r = interest rate dependent on the type of debt instrument to be used

The results of the present worth analysis should be used in evaluating the cost of each alternative in relation to its benefits.

Please attach the economic viability for each alternative(s).

The Appendix includes economic analysis for each option considered.

D. Return Flow Considerations (Optional):

Demonstrate that water quantity in the receiving water is limited and there are potential water quantity gaps under low flow conditions, then the water quantity benefits of allowing a surface water discharge outweigh the effects of lower water quality resulting from the discharge provided the water quality to protect the existing uses will be maintained. This demonstration might include, but is not limited to, references to surface water flow needs identified in an applicable Regional Water Plan, TMDL, applicable recommendations for water management or the need to support aquatic life and drinking water supplies.

N/A

Section 4. Practicable Alternative Chosen – Include rationale.

After evaluating the alternatives to address the current and future wastewater needs for the City of Franklin Springs, the most technically and economically feasible alternative is to construct a 1.5 MGD mechanical water pollution control plant with a direct discharge at North Fork Broad River. The direct discharge alternative is the only feasible option.

The direct discharge alternative will meet the effluent limits in the wasteload allocation provided by Georgia EPD and allow for continued growth within the City's sewerage service area. The City selected the Carrousel design option for the proposed aeration basin, which they believe has the best treatment vs. operability characteristics.

Section 5. Certification	
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.	
Name: Lee Moore	**Date:** 4/15/24
Title: Mayor	**Telephone:** 706-4198-5656
Signature:	

Appendix

Appendix A	Cost Estimate
Appendix B	Inflow and Infiltration Analysis
Appendix C	Population Projections
Appendix D	Soil Resource Report
Appendix E	LAS Site Report
Appendix F	Industrial Flow Documentation
Appendix G	LAS Calculations
Appendix H	Plant Flow Schematic
Appendix I	Recent Property Sale Values
Appendix J	LAS Site Map

Appendix A:
Cost Estimate

CITY OF FRANKLIN SPRINGS, GEORGIA
ALTERNATIVE 1 - 1.5 MGD MECHANICAL PLANT W/ DIRECT DISCHARGE
PRELIMINARY PROJECT COST ESTIMATE
APRIL 2023

Item No.	Est. Qty.	Units	Description	Unit Cost	Total Cost
1.			**Mobilization, Bonds and Insurance**		**$750,000**
a.	1	LS	Bonds and Insurance	525,000.00	$525,000
b.	1	LS	Mobilization & Demobilization	100,000.00	$225,000
2.			**Influent Sewer**		**$982,500**
a.	1500	LF	24" Influent Sewer	575.00	$862,500
b.	8	EA	Manholes	15,000.00	$120,000
3.			**Site Work**		**$3,830,500**
a.	1	LS	Clearing & Grubbing	150,000.00	$20,000
b.	1	LS	Grading - Site	400,000.00	$650,000
c.	1	LS	Grassing	35,000.00	$35,000
d.	1	LS	Soil Erosion & Sedimentation Control	200,000.00	$200,000
e.	1	LS	Asphalt Drives	180,000.00	$180,000
f.	1	LS	Pavement Striping	5,500.00	$5,500
g.	1	LS	Concrete Sidewalks	65,000.00	$65,000
h.	1	LS	Fencing	135,000.00	$135,000
i.	1	LS	Storm Drains	65,000.00	$65,000
j.	1	LS	Yard Piping - DIP, Fitting, and Appurtenances	1,500,000.00	$1,500,000
k	1	LS	Yard Piping -Water Lines and Appurtenances	85,000.00	$85,000
l.	1	LS	Chemical Feed Lines and Appurtenances	15,000.00	$15,000
m.	1	LS	Sewer Manholes	125,000.00	$125,000
n.	1	LS	Electrical - Duct Banks and Site Lighting	750,000.00	$750,000
4.			**Raw Sewage Pump Station**		**$1,926,500**
a.	1	LS	Structural Excavation - including Stone and Backfill	160,000.00	$160,000
b.	1	LS	Concrete - Slab on Grade	90,000.00	$90,000
c.	1	LS	Concrete - Walls	560,000.00	$560,000
d.	1	LS	Concrete - Elevated Slabs	90,000.00	$90,000
e.	1	LS	Concrete or Grout Fill	3,500.00	$3,500
f.	1	LS	Misc. Metals	140,000.00	$140,000
g.	1	LS	Piping	310,000.00	$310,000
h.	1	LS	Painting	25,000.00	$25,000
i.	1	LS	Hoist and Frame	38,000.00	$38,000
j.	1	LS	Submersible Pumps	425,000.00	$425,000
k	1	LS	Electrical	85,000.00	$85,000
5.			**Grit Structure**		**$1,172,500**
a.	1	LS	Structural Excavation - including Stone & Backfill	55,000.00	$55,000

Item No.	Est. Qty.	Units	Description	Unit Cost	Total Cost
b.	1	LS	Concrete - Slab on Grade	50,000.00	$50,000
c.	1	LS	Concrete - Walls	24,000.00	$24,000
d.	1	LS	Concrete Paving	22,000.00	$22,000
e.	1	LS	Concrete - Grout & Concrete Fill	18,000.00	$18,000
f.	1	LS	Misc. Metals	15,000.00	$15,000
g.	1	LS	Piping	110,000.00	$110,000
h.	1	LS	Painting	8,500.00	$8,500
i.	1	LS	Grit Equipment	410,000.00	$410,000
j.	1	LS	Mechanical Bar Screen	385,000.00	$385,000
k.	1	LS	Electrical	75,000.00	$75,000
6.	**Aeration Basin**				**$5,007,500**
a.	1	LS	Structural Excavation - including Stone & Backfill	500,000.00	$500,000
b.	1	LS	Concrete - Slab on Grade	675,000.00	$675,000
c.	1	LS	Concrete - Walls	1,750,000.00	$1,750,000
d.	1	LS	Concrete - Elevated Slabs	650,000.00	$650,000
e.	1	LS	Concrete Pipe Encasement	45,000.00	$45,000
f.	1	LS	Misc. Metals	150,000.00	$150,000
g.	1	LS	Piping	75,000.00	$75,000
h.	1	LS	Painting	12,500.00	$12,500
i.	1	LS	Aeration Equipment	1,095,000.00	$1,095,000
j.	1	LS	Electrical	55,000.00	$55,000
7.	**Clarifiers**				**$2,059,000**
a.	1	LS	Structural Excavation - including Stone & Backfill	250,000.00	$250,000
b.	1	LS	Concrete - Slab on Grade	250,000.00	$250,000
c.	1	LS	Concrete - Walls	450,000.00	$450,000
d.	1	LS	Concrete - Elevated Slabs	75,000.00	$75,000
d.	1	LS	Concrete or Grout Fill	45,000.00	$45,000
e.	1	LS	Concrete Pipe Encasement	25,000.00	$25,000
f.	1	LS	Misc. Metals	115,000.00	$115,000
g.	1	LS	Piping	215,000.00	$215,000
h.	1	LS	Painting	50,000.00	$50,000
i.	1	LS	Clarifier Equipment	534,000.00	$534,000
j.	1	LS	Electrical	50,000.00	$50,000
8.	**Effluent Structure**				**$2,889,000**
a.	1	LS	Structural Excavation - including Stone & Backfill	65,000.00	$65,000
b.	1	LS	Concrete - Slab on Grade	105,000.00	$105,000
c.	1	LS	Concrete - Walls	250,000.00	$250,000
d.	1	LS	Concrete - Elevated Slabs	25,000.00	$25,000
e.	1	LS	Concrete or Grout Fill	60,000.00	$60,000
f.	1	LS	Concrete Pipe Encasement	9,000.00	$9,000
g.	1	LS	Canopy	150,000.00	$150,000
h.	1	LS	Misc. Metals	70,000.00	$70,000
i.	1	LS	Piping	165,000.00	$165,000

Item No.	Est. Qty.	Units	Description	Unit Cost	Total Cost
j.	1	LS	Parshall Flume and Meter	15,000.00	$15,000
k.	1	LS	Painting	50,000.00	$50,000
l.	1	LS	Filter Equipment	1,050,000.00	$1,050,000
m.	1	LS	UV Equipment	775,000.00	$775,000
n.	1	LS	Effluent Sampler	10,000.00	$10,000
o.	1	LS	Electrical	90,000.00	$90,000
9.	**Cascade Aerator**				**$235,000**
a.	1	LS	Structural Excavation - including Stone & Backfill	50,000.00	$50,000
b.	1	LS	Concrete - Slab on Grade	65,000.00	$65,000
c.	1	LS	Concrete - Walls	55,000.00	$55,000
d.	1	LS	Concrete Pipe Encasement	5,000.00	$5,000
e.	1	LS	Misc. Metals	30,000.00	$30,000
f.	1	LS	Piping	30,000.00	$30,000
10.	**RAS Pump Station**				**$865,000**
a.	1	LS	Structural Excavation - including Stone & Backfill	45,000.00	$45,000
b.	1	LS	Concrete - Slab on Grade	50,000.00	$50,000
c.	1	LS	Concrete - Walls	100,000.00	$100,000
d.	1	LS	Concrete - Elevated Slabs	25,000.00	$25,000
e.	1	LS	Concrete or Grout Fill	7,500.00	$7,500
f.	1	LS	Concrete Pipe Encasement	2,500.00	$2,500
g.	1	LS	Misc. Metals	25,000.00	$25,000
h.	1	LS	Piping	125,000.00	$125,000
i.	1	LS	Painting	35,000.00	$35,000
j.	1	LS	Montana Flume and Meter	15,000.00	$15,000
k.	1	LS	Submersible Pumps	375,000.00	$375,000
l.	1	LS	Electrical	60,000.00	$60,000
11.	**Aerobic Digesters**				**$1,125,000**
a.	1	LS	Structural Excavation - including Stone & Backfill	80,000.00	$80,000
b.	1	LS	Concrete - Slab on Grade	210,000.00	$210,000
c.	1	LS	Concrete - Walls	275,000.00	$275,000
d.	1	LS	Concrete - Elevated Slabs	50,000.00	$50,000
e.	1	LS	Concrete Pipe Encasement	5,000.00	$5,000
f.	1	LS	Misc. Metals	35,000.00	$35,000
g.	1	LS	Piping	100,000.00	$100,000
h.	1	LS	Painting	20,000.00	$20,000
i.	1	LS	Aeration Equipment	275,000.00	$275,000
j.	1	LS	Electrical	75,000.00	$75,000
12.	**Sludge Dewatering Building**				**$2,360,000**
a.	1	LS	Structural Excavation - including Stone & Backfill	35,000.00	$35,000
b.	1	LS	Concrete - Slab on Grade	200,000.00	$200,000
c.	1	LS	Concrete - Walls	75,000.00	$75,000
d.	1	LS	Concrete or Grout Fill	5,000.00	$5,000

Item No.	Est. Qty.	Units	Description	Unit Cost	Total Cost
e.	1	LS	Concrete - Pipe Encasement	15,000.00	$15,000
f.	1	LS	Masonry	110,000.00	$110,000
g.	1	LS	Roofing System Complete	175,000.00	$175,000
h.	1	LS	Overhead Door	25,000.00	$25,000
i.	1	LS	Exterior Doors	15,000.00	$15,000
j.	1	LS	Windows	25,000.00	$25,000
k.	1	LS	HVAC	50,000.00	$50,000
l.	1	LS	Misc. Metals	40,000.00	$40,000
m.	1	LS	Piping	65,000.00	$65,000
n.	1	LS	Painting	75,000.00	$75,000
o.	1	LS	Equipment	1,000,000.00	$1,000,000
p.	1	LS	Electrical	450,000.00	$450,000
13.	**Chemical Feed Structure**				**$773,000**
a.	1	LS	Structural Excavation - including Stone & Backfill	15,000.00	$15,000
b.	1	LS	Concrete - Slab on Grade	100,000.00	$100,000
c.	1	LS	Concrete - Walls	35,000.00	$35,000

Item No.	Est. Qty.	Units	Description	Unit Cost	Total Cost
d.	1	LS	Misc. Metals	15,000.00	$15,000
e.	1	LS	Piping	80,000.00	$80,000
f.	1	LS	Painting	18,000.00	$18,000
g.	1	LS	Chemical Tanks	175,000.00	$175,000
h.	1	LS	Chemical Feed Equipment	250,000.00	$250,000
i.	1	LS	Electrical	85,000.00	$85,000
14.	**Control Buildng**				**$1,593,000**
a.	1	LS	Structural Excavation - including Stone & Backfill	12,000.00	$12,000
b.	1	LS	Concrete	45,000.00	$45,000
c.	1	LS	Masonry	125,000.00	$125,000
d.	1	LS	Roofing System Complete	100,000.00	$100,000
e.	1	LS	Siding, Soffits, & Facia	18,000.00	$18,000
f.	1	LS	Exterior Doors	18,000.00	$18,000
g.	1	LS	Interior Doors	25,000.00	$25,000
h.	1	LS	Windows	25,000.00	$25,000
i.	1	LS	Framing and Wall Coverings	30,000.00	$30,000
j.	1	LS	Floor Coverings	20,000.00	$20,000
k.	1	LS	Suspended Ceilings	20,000.00	$20,000
l.	1	LS	HVAC	75,000.00	$75,000
m.	1	LS	Plumbing & Plumbing Fixtures	75,000.00	$75,000
n.	1	LS	Casework and Counters	125,000.00	$125,000
o.	1	LS	Specialties	15,000.00	$15,000
p.	1	LS	Office Furnishings	35,000.00	$35,000
q.	1	LS	Painting	85,000.00	$85,000
r.	1	LS	Electrical	145,000.00	$145,000
s.	1	LS	MCC & Gear Package	600,000.00	$600,000
15.	**Generator**				**$527,500**
a.	1	LS	Concrete Pad	27,500.00	$27,500
b.	1	LS	Generator Equipment	500,000.00	$500,000
16.	**SCADA**				**$350,000**
a.	1	LS	SCADA/ Instrumentation	350,000.00	$350,000
17.	**Project Allowances**				**$222,000**
a.	1	LS	Landscaping	40,000.00	$40,000
b.	1	LS	Spare Parts	30,000.00	$30,000
c.	1	LS	Laboratory Equipment	50,000.00	$50,000
d.	1	LS	Aeration Basin Velocity and Oxygen Testing	90,000.00	$90,000
e.	1	LS	Seed Sludge Hauling	12,000.00	$12,000
Total Estimated Construction Cost					**$26,668,000**

Capital Cost Estimate

Project Name: City of Franklin Springs, GA
1.5 MGD Mecahanical Plant w/ Direct Discharge

Planning period (years): 20
Initial Year: 2023

Estimated Construction Costs	
Mobilization, Bonds and Insurance	$750,000
Influent Sewer	$982,500
Site Work	$3,830,500
Grit Structure	$1,172,500
Raw Sewage Pump Station	$1,926,500
Aeration Basin	$5,007,500
Clarifiers	$2,059,000
Effluent Structure	$2,889,000
Cascade Aerator	$235,000
RAS Pump Station	$865,000
Aerobic Digesters	$1,125,000
Sludge Dewatering Building	$2,360,000
Chemical Feed Structure	$773,000
Control Buildng	$1,593,000
Generator	$527,500
SCADA	$350,000
Project Allowances	$222,000
Total Estimated Construction Costs	$26,668,000
Contingencies	$2,666,800
Engineering	$2,133,440
Inspection	$800,040
Antidegradation Report	$10,000
Environmental Review and Planning Document	$10,000
Design Development Report	$10,000
Permits	$10,000
Testing, Topo Survey	$25,000
O&M Manual	$15,000
Watershed Assessment	$80,000
Administration & Legal	$15,000
Total Estimated Project Costs	$32,443,280

Cost Effective Analysis

Project Name: City of Franklin Springs, GA | Planning period (years): 20
1.5 MGD Mecahanical Plant w/ Direct Discharge | Discount Rate 4.20% | 2023

Itemized Depreciation:		Initial Costs	Useful Life (years)	Salvage Value
1 Mobilization, Bonds and Insurance	$	750,000	20	$0
2 Influent Sewer	$	982,500	20	$0
3 Site Work	$	3,830,500	20	$0
4 Grit Structure	$	1,172,500	20	$0
5 Raw Sewage Pump Station	$	1,926,500	20	$0
6 Aeration Basin	$	5,007,500	20	$0
7 Clarifiers	$	2,059,000	20	$0
8 Effluent Structure	$	2,889,000	20	$0
9 Cascade Aerator	$	235,000	20	$0
10 RAS Pump Station	$	865,000	20	$0
11 Aerobic Digesters	$	1,125,000	20	$0
12 Sludge Dewatering Building	$	2,360,000	20	$0
13 Chemical Feed Structure	$	773,000	20	$0
14 Control Buildng	$	1,593,000	40	$796,500
15 Generator	$	527,500	20	$0
16 SCADA	$	350,000	20	$0
17 Project Allowances	$	222,000	20	$0
sum =		$26,668,000		$796,500

Estimate of Additional Operation and Maintenance Costs

Constant O&M Costs	
Utilities	$104,200
Salaries	$84,000
Employee Benefits	$1,500
Payroll Tax	$3,000
Vehicle Maintenance	$1,500
Fuel	$2,500
Office Supplies/ Equipment	$2,000
Tools	$250
Uniforms	$300
Training & Seminars	$750
Insurance	$6,125
Advertising/ Legal Notices	$250
Miscellaneous	$2,948
Postage & Shipping	$1,425
Waste Water Lines Maintenance	$21,000
Waste Water Lift Pump Maintenance	$3,000
Waste Water Lab Analysis	$1,300
Waste Water Chemicals	$15,000
Capital Outlay	$6,159
Total Sewerage System O&M Costs	**$257,207**

Replacement Cost and Salvage Cost Summary

Project Name: City of Franklin Springs, GA
1.5 MGD Mecahanical Plant w/ Direct Discharge

Planning period (years): 20
4.20% 2023

Itemized Depreciation:

		Initial Costs	Life	Replacement Cost 5 Years	Replacement Cost 10 Years	Replacement Cost 15 Years	Salvage Value of Replacements
1	Mobilization, Bonds and Insurance	$750,000	20	$0	$0	$0	$0
2	Influent Sewer	$982,500	20	$0	$0	$0	$0
3	Site Work	$3,830,500	20	$0	$0	$0	$0
4	Grit Structure	$1,172,500	20	$0	$0	$0	$0
5	Raw Sewage Pump Station	$1,926,500	20	$0	$60,000	$0	$0
6	Aeration Basin	$5,007,500	20	$50,000	$50,000	$100,000	$66,667
7	Clarifiers	$2,059,000	20	$0	$0	$0	$0
8	Effluent Structure	$2,889,000	20	$0	$0	$0	$0
9	Cascade Aerator	$235,000	20	$0	$0	$0	$0
10	RAS Pump Station	$865,000	20	$0	$50,000	$0	$0
11	Aerobic Digesters	$1,125,000	20	$0	$0	$0	$0
12	Sludge Dewatering Building	$2,360,000	20	$0	$0	$0	$0
13	Chemical Feed Structure	$773,000	20	$0	$0	$0	$0
14	Control Buildng	$1,593,000	40	$0	$0	$0	$0
15	Generator	$527,500	20	$0	$0	$0	$0
16	SCADA	$350,000	20	$0	$0	$0	$0
17	Project Allowances	$222,000	20	$0	$0	$0	$0
		$26,668,000		$50,000	$160,000	$100,000	$66,667

Contingencies	$2,666,800
Engineering	$2,133,440
Inspection	$800,040
Antidegradation Report	$10,000
Environmental Review and Planning Document	$10,000
Design Development Report	$10,000
Permits	$10,000
Testing, Topo Survey	$25,000
O&M Manual	$15,000
Watershed Assessment	$80,000
Administration & Legal	$15,000
Total Estimated Project Cost	**$32,443,280**

Total Replacement Cost	$50,000	$160,000	$100,000	

Average Equivalent Annual Cost

Project Name: City of Franklin Springs, GA 4.20% 2023

1.5 MGD Mecahanical Plant w/ Direct Discharge

Planning Period (years)	**20 years**
Construction Period (years)	**1**
Initial Capital Cost of Project	$32,443,280
Replacement Cost at Year 5	$50,000
Replacement Cost at Year 10	$160,000
Replacement Cost at Year 15	$100,000
Constant O&M Cost	$257,207
Variable Annual O&M Cost	$0

Discount Rate from OMB Circ. A-94: 4.20%

Determine Present Worth and Average Equivalent Annual Cost of this Alternate over 20 years

Factors: 20 years	4.00%
Present Worth of Constant annual O&M cost (P/A):	13.35278
Present Worth of Variable annual O&M cost (annual increase) (P/G):	108.78860
Present Worth of Replacement Cost – Year 5 (P/F):	0.81407
Present Worth of Replacement Cost – Year 10 (P/F):	0.66271
Present Worth of Replacement Cost – Year 15 (P/F):	0.53949
Present Worth of salvage value:	0.43918
Interest During Construction:	$648,866

Equivalent Annual Cost = Total Present Worth * (A/P)

Calculations – Present Worth

Total Capital Cost of Project	P	$32,443,280
Constant O&M	P/A	$3,434,429
Variable O&M	P/G	$0
Replacement Cost	P/F	$200,686
Interest During Construction	P*I	$648,866
Total Present Worth		$36,727,261

Average Equivalent Annual Cost ***$2,750,532***

ALTERNATIVE 1 - CONSTRUCT LAND APPLICATION SYSTEM (1.5 MGD)
PRELIMINARY CONSTRUCTION COST ESTIMATE

Item No.	Est. Qty.	Units	Description	Unit Cost	Total Cost
1.	**Mobilization, Bonds and Insurance**				**$400,000**
a.	1	LS	Bonds and Insurance	$300,000	$300,000
b.	1	LS	Mobilization	$100,000	$100,000
2.	**Site Work**				**$5,582,240**
a.	391	AC	Clearing and Grubbing	$10,000	$3,910,000
b.	1	LS	Grading - Site	$100,000	$100,000
c.	300	AC	Grassing	$3,000	$900,000
d.	1	LS	Gravel Around Sprayfields	$150,000	$150,000
e.	14,890	LF	Fencing	$25	$372,240
f.	1	LS	Storm Drainage	$50,000	$50,000
g.	1	LS	Yard Piping	$25,000	$25,000
h.	1	LS	Soil Erosion and Sedimentation Control	$75,000	$75,000
3.	**Treatment, Holding Pond Facilities**				**$6,930,920**
a.	10	AC	Aerated Treatment Pond - Grading and Liner	$100,000	$1,000,000
b.	2	EA	Floating Baffle Curtains	$160,000	$320,000
c.	10	AC	Holding Pond, Grading, and Liner	$125,000	$1,250,000
d.	30	EA	Floating Aerators - 10 HP	$50,000	$1,500,000
e.	1	LS	Standby Generator, Auto Transfer Switch	$150,000	$150,000
f.	1	LS	Mechanical Bar Screen	$200,000	$200,000
g.	1	LS	Controls and Electrical	$250,000	$250,000
h.	1	LS	Site Improvements	$75,000	$75,000
i.	24,288	LF	10" Force Main	$90	$2,185,920
4.	**Construct Proposed Sprayfields**				**$7,072,064**
a.	1	LS	Irrigation Pump Station	$1,200,000	$1,200,000
b.	274	AC	Irrigation Site Preparation	$800	$219,200
c.	504,708	LF	Irrigation Piping (Aluminum)	$8	$4,037,664
d.	21,920	EA	Irrigation Spray Heads	$60	$1,315,200
e.	20	EA	Monitoring Wells	$12,500	$250,000
f.	1	LS	Miscellaneous, Signage	$50,000	$50,000
5.	**Raw Sewage Pump Station**				**$1,926,500**
a.	1	LS	Structural Excavation - including Stone and Backfill	$160,000	$160,000
b.	1	LS	Concrete - Slab on Grade	$90,000	$90,000
c.	1	LS	Concrete - Walls	$560,000	$560,000
d.	1	LS	Concrete - Elevated Slabs	$90,000	$90,000
e.	1	LS	Concrete or Grout Fill	$3,500	$3,500
f.	1	LS	Misc. Metals	$140,000	$140,000
g.	1	LS	Piping	$310,000	$310,000
h.	1	LS	Painting	$25,000	$25,000
i.	1	LS	Hoist and Frame	$38,000	$38,000
j.	1	LS	Submersible Pumps	$425,000	$425,000

Item No.	Est. Qty.	Units	Description	Unit Cost	Total Cost
k	1	LS	Electrical	$85,000	$85,000

Total Estimated Construction Cost	***$21,911,724***

Item No.	Est. Qty.	Units	Description	Unit Cost	Total Cost
			Project Cost Summary		
			Total Estimated Construction Cost		$21,911,724
			Contingencies		$2,191,123
			Engineering		$1,149,700
			Inspection		$583,200
			Permits and Easements		$30,000
			Testing, Topographic Survey		$60,000
			Reports/O&M		$50,000
			Administration and Legal		$80,000
			Equipment		$75,000
			Land Acquisition Cost (1,540 acres @ $1,800/ac.)		$2,772,000
			Total Estimated Project Cost		**$28,902,747**

Capital Cost Estimate

Project Name: City of Franklin Springs, GA | Planning period (years): 20
Alternative 1: Construct LAS (1.5 MGD) | Initial Year: 2023

Estimated Construction Costs	
Mobilization, Bonds and Insurance	$400,000
Site Work	$5,582,240
Treatment, Holding Pond Facilities	$6,930,920
Construct Proposed Sprayfields	$7,072,064
Pump Station	$1,926,500
Total Estimated Construction Costs	$21,911,724
Contingencies	$2,191,200
Engineering	$1,752,938
Inspection	$657,352
Antidegradation Report	$10,000
Environmental Review and Planning Document	$10,000
Design Development Report	$10,000
Permits	$10,000
Topo Survey/ Soil Reports	$90,000
O&M Manual	$25,000
Permits & Easement Assistance	$30,000
Sprayfield Site Maintenance Equipment	$100,000
Land Acquisition Cost (391 acres @ $7622/ac.)	$2,980,202
Legal/ Administrative	$80,000
Total Estimated Project Costs	$29,858,416

Cost Effective Analysis

Project Name: City of Franklin Springs, GA — Planning period (years): 20
Alternative 1: Construct LAS (1.5 MGD) — Discount Rate 4.20%

Itemized Depreciation:	Initial Costs	Useful Life (years)	Salvage Value
1 Mobilization, Bonds and Insurance	$ 400,000	20	$0
2 Site Work	$ 5,582,240	20	$0
3 Treatment, Holding Pond Facilities	$ 6,930,920	20	$0
4 Construct Proposed Sprayfields	$ 7,072,064	20	$0
5 Pump Station	$ 1,926,500	20	$0
sum =	$21,911,724		$0

Estimate of Additional Operation and Maintenance Costs

Constant O&M Costs	
Utilities	$80,000
Salaries	$54,000
Employee Benefits	$1,500
Payroll Tax	$3,000
Vehicle Maintenance	$1,500
Fuel	$2,500
Office Supplies/ Equipment	$2,000
Tools	$250
Uniforms	$300
Training & Seminars	$750
Insurance	$6,125
Advertising/ Legal Notices	$250
Miscellaneous	$2,948
Postage & Shipping	$1,425
Waste Water Lines Maintenance	$21,000
Waste Water Lift Pump Maintenance	$3,000
Waste Water Lab Analysis	$1,300
Waste Water Chemicals	$15,000
Capital Outlay	$6,159
Total Sewerage System O&M Costs	**$203,007**

Replacement Cost and Salvage Cost Summary

Project Name: City of Dawsonville, GA
Alternative 1: Construct LAS (1.5 MGD)

Planning period (years): 20
Initial Year: 2023

Itemized Depreciation:

		Initial Costs	Life	Replacement Cost 5 Years	Replacement Cost 10 Years	Replacement Cost 15 Years	Salvage Value of Replacements
1	Mobilization, Bonds and Insurance	$400,000	20	$0	$0	$0	$0
2	Site Work	$5,582,240	20	$0	$0	$0	$0
3	Treatment, Holding Pond Facilities	$6,930,920	20	$0	$0	$500,000	$333,333
4	Construct Proposed Sprayfields	$7,072,064	20	$20,000	$80,000	$20,000	$13,333
5	Pump Station	$1,926,500	20	$0	$30,000	$0	$0
Total Estimated Construction Costs		**$21,911,724**		$20,000	$110,000	$520,000	$346,666
	Contingencies	$2,191,200					
	Engineering	$1,752,938					
	Inspection	$657,352					
	Antidegradation Report	$10,000					
	Environmental Review and Planning Document	$10,000					
	Design Development Report	$10,000					
	Topo Survey/ Soil Reports	$90,000					
	O&M Manual	$25,000					
	Permits & Easement Assistance	$30,000					
	Sprayfield Site Maintenance Equipment	$100,000					
	Land Acquisition Cost (391 acres @ $7622/ac.)	$2,980,202					
	Legal/ Administrative	$80,000					
Total Estimated Project Cost		**$29,848,416**					
Total Replacement Cost				$20,000	$110,000	$520,000	
Total Salvage Value							$346,666

Average Equivalent Annual Cost

Project Name: City of Dawsonville, GA

Alternative 1: Construct LAS (1.5 MGD)

Planning Period (years)	**20**	**years**
Construction Period (years)	**1**	
Initial Capital Cost of Project	$29,858,416	
Replacement Cost at Year 5	$20,000	
Replacement Cost at Year 10	$110,000	
Replacement Cost at Year 15	$520,000	
Salvage Value at Year 20	$346,666	
Constant O&M Cost	$203,007	
Variable Annual O&M Cost	$0	
Discount Rate from OMB Circ. A-94:	4.20%	

Determine Present Worth and Average Equivalent Annual Cost of this Alternate over 20 years

Factors:	20 years	4.00%
Present Worth of Constant annual O&M cost (P/A):		13.35278
Present Worth of Variable annual O&M cost (annual increase) (P/G):		108.78860
Present Worth of Replacement Cost – Year 5 (P/F):		0.81407
Present Worth of Replacement Cost – Year 10 (P/F):		0.66271
Present Worth of Replacement Cost – Year 15 (P/F):		0.53949
Present Worth of salvage value:		0.43918
Interest During Construction:		$597,168

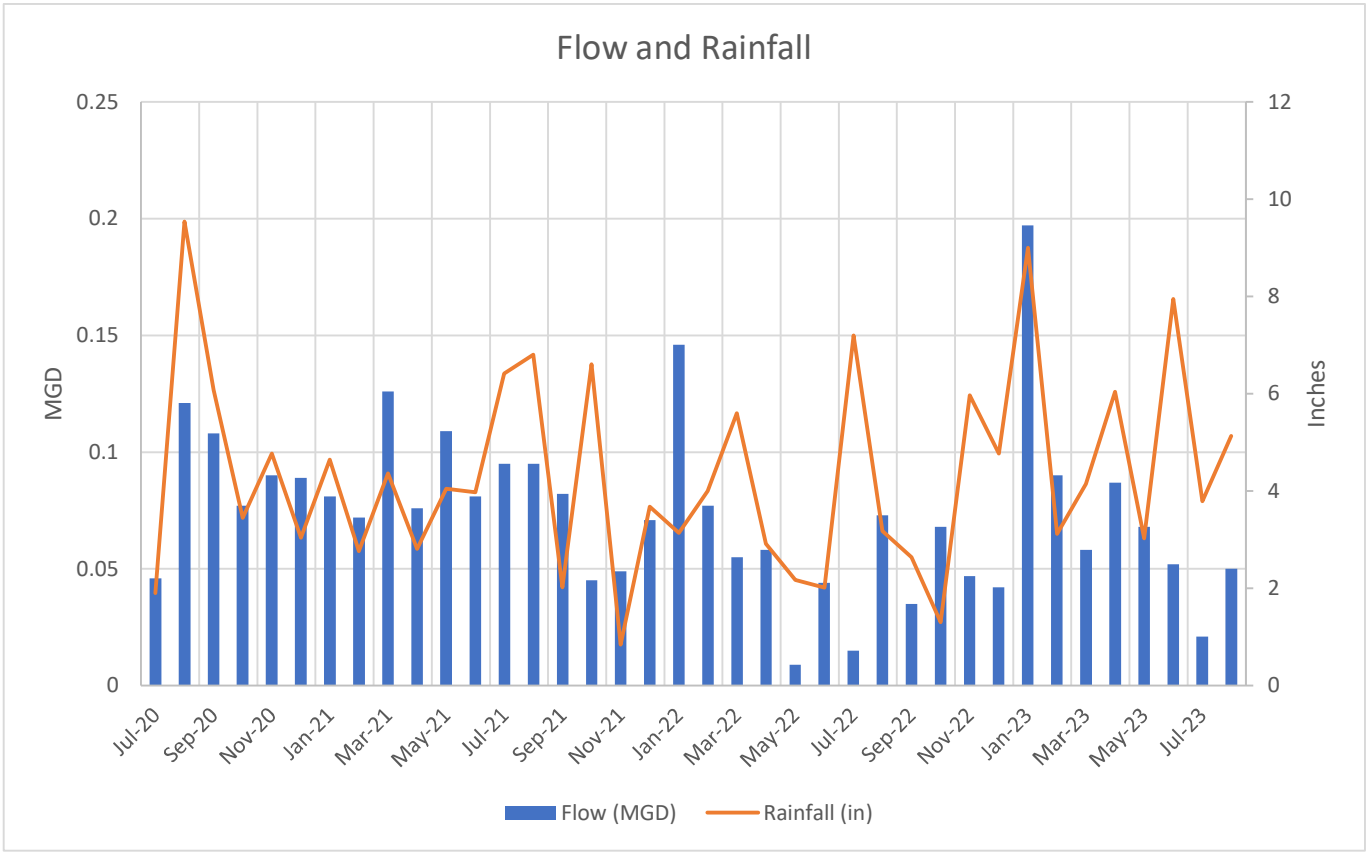
Equivalent Annual Cost = Total Present Worth * (A/P)

Calculations – Present Worth

Total Capital Cost of Project	P	$29,858,416
Constant O&M	P/A	$2,710,708
Variable O&M	P/G	$0
Replacement Cost	P/F	$369,715
Salvage Value	P/F	($152,250)
Interest During Construction	P*I	$597,168
Total Present Worth		$33,383,757

Average Equivalent Annual Cost	***$2,500,135***

Appendix B:
Inflow and Infiltration Analysis

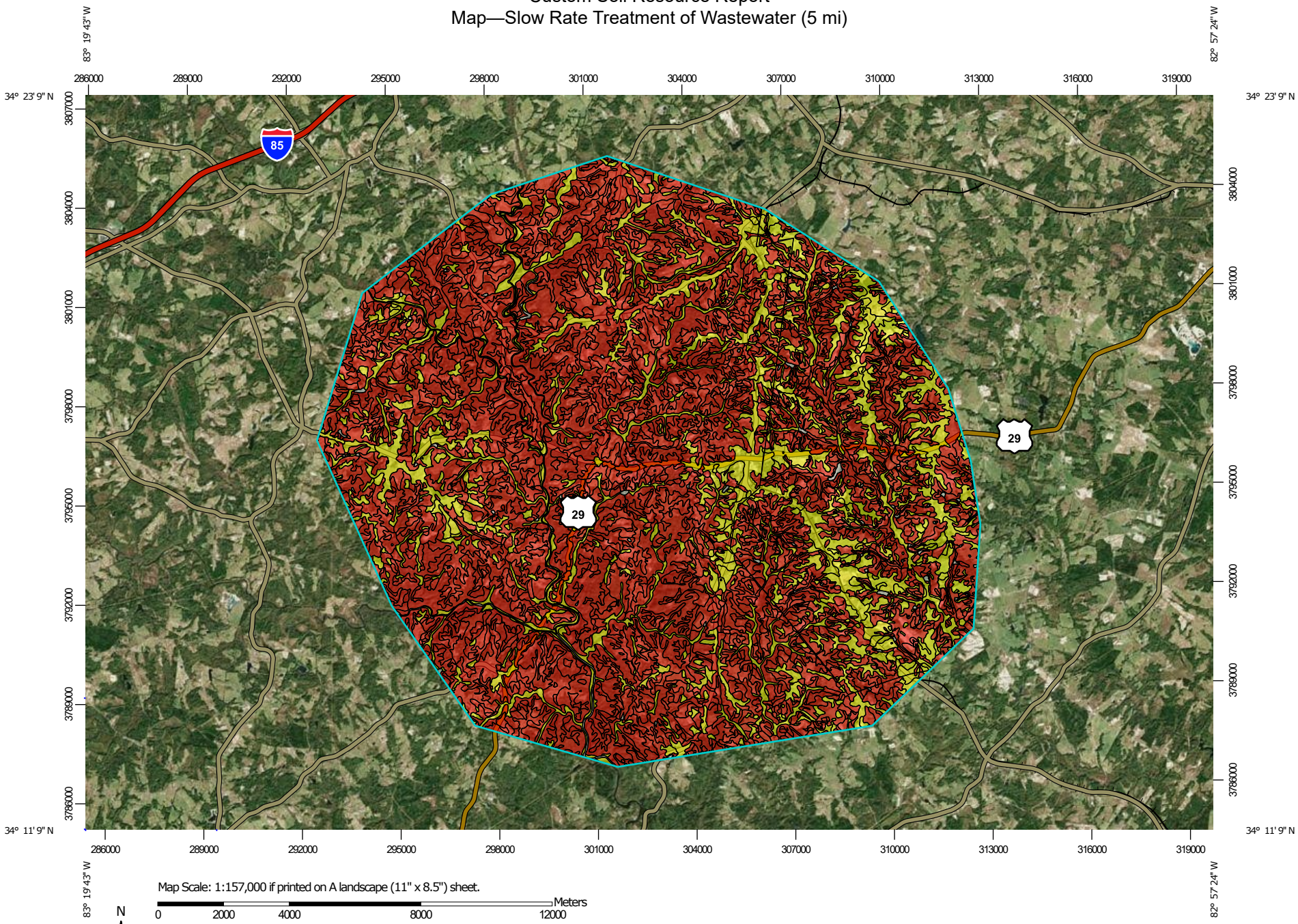

Flow and Rainfall
MGD
Inches
0.25
0.2
0.15
0.1
0.05
0
12
10
8
6
4
2
0
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
May-21
Jul-21
Sep-21
Nov-21
Jan-22
Mar-22
May-22
Jul-22
Sep-22
Nov-22
Jan-23
Mar-23
May-23
Jul-23
Flow (MGD)
Rainfall (in)

Appendix C:
Population Projections

Year	Franklin County (OPB Projections)	Annual Growth Rate	Franklin Springs (OPB Projections)	Flow (gpd)	Gallons per day per Capita	
2020	23,424		1,155	99,000	86	Actual
2022	23,917	1.05%	1,179	82,000	70	
2023	24,136	0.92%	1,190	56,000	47	
2024	24,373	0.98%	1,202	132,183	110	Projected
2025	24,636	1.08%	1,215	133,609	110	
2026	24,866	0.93%	1,226	134,857	110	
2027	25,135	1.08%	1,239	136,316	110	
2028	25,481	1.38%	1,256	138,192	110	
2029	25,867	1.51%	1,275	140,286	110	
2030	26,166	1.16%	1,290	141,907	110	
2031	26,513	1.33%	1,307	143,789	110	
2032	26,891	1.43%	1,326	145,839	110	
2033	27,233	1.27%	1,343	147,694	110	
2034	27,645	1.51%	1,363	149,928	110	
2035	28,073	1.55%	1,384	152,249	110	
2036	28,437	1.30%	1,402	154,224	110	
2037	28,766	1.16%	1,418	156,008	110	
2038	29,137	1.29%	1,437	158,020	110	
2039	29,543	1.39%	1,457	160,222	110	
2040	29,925	1.29%	1,475	162,294	110	
2041	30,344	1.40%	1,496	164,566	110	
2042	30,709	1.20%	1,514	166,545	110	
2043	31,118	1.33%	1,534	168,764	110	

Appendix D:
Soil Resource Report

Map—Slow Rate Treatment of Wastewater (5 mi)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Elbert, Franklin, and Madison Counties, Georgia
Survey Area Data: Version 15, Sep 14, 2022

Soil Survey Area: Hart County, Georgia
Survey Area Data: Version 14, Sep 13, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

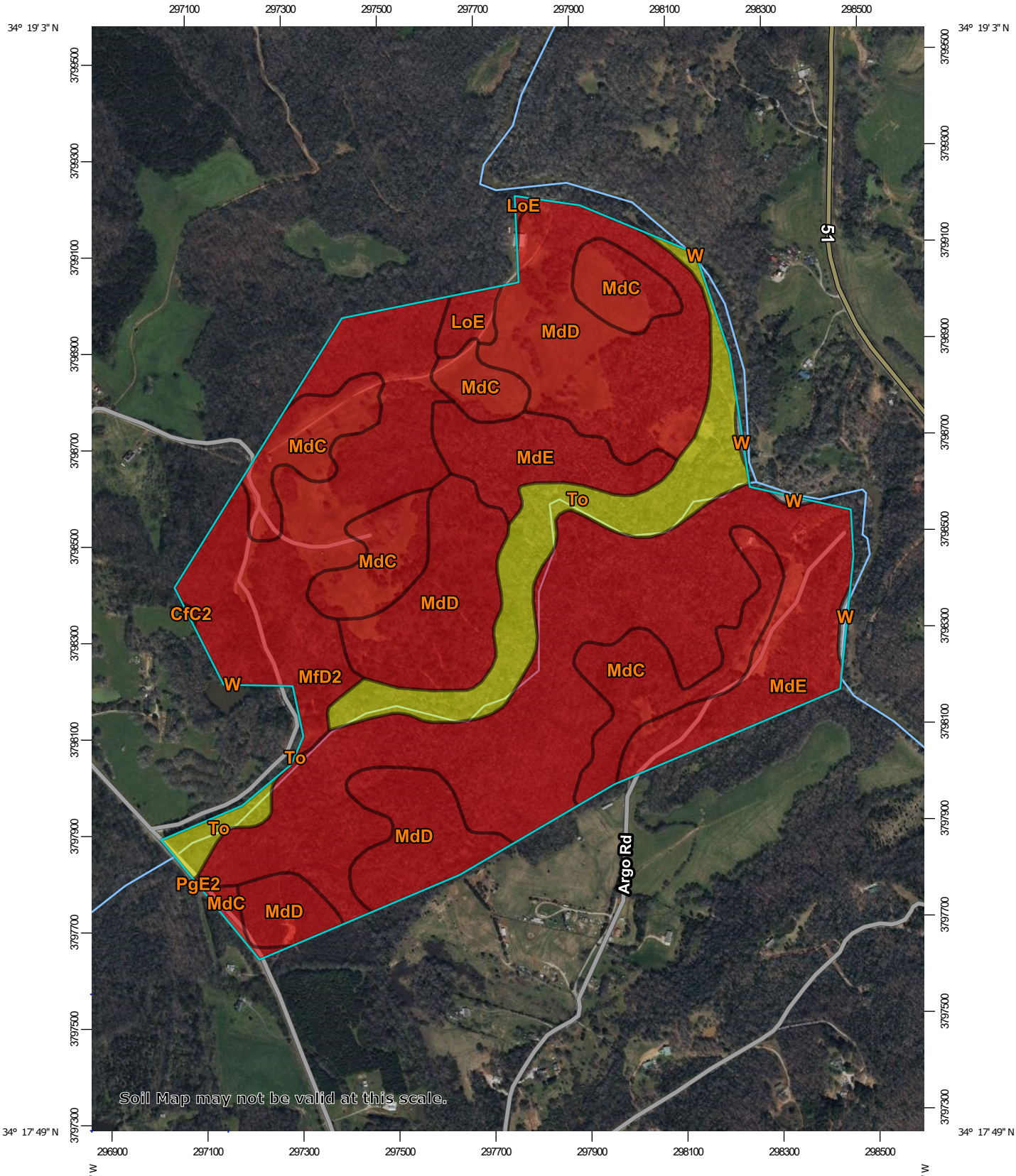
MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Appendix E:
LAS Site Report

Slow Rate Treatment of Wastewater—Elbert, Franklin, and Madison Counties, Georgia
(Potential LAS Site)



Map Scale: 1:11,200 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Elbert, Franklin, and Madison Counties, Georgia
Survey Area Data: Version 16, Aug 30, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 19, 2022—Apr 20, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Slow Rate Treatment of Wastewater

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
CfC2	Cecil sandy clay loam, 6 to 10 percent slopes, eroded	Very limited	Cecil (100%)	Too steep for surface application (1.00)	0.1	0.0%
				Too acid (0.77)		
				Low adsorption (0.72)		
				Too steep for sprinkler irrigation (0.22)		
LoE	Louisa gravelly loam, 10 to 30 percent slopes	Very limited	Louisa (100%)	Slow water movement (1.00)	3.6	1.1%
				Depth to bedrock (1.00)		
				Too steep for surface application (1.00)		
				Too steep for sprinkler irrigation (1.00)		
				Too acid (0.92)		
MdC	Madison sandy loam, 6 to 10 percent slopes	Very limited	Madison (99%)	Too steep for surface application (1.00)	49.9	15.1%
				Too acid (0.77)		
				Too steep for sprinkler irrigation (0.22)		
MdD	Madison sandy loam, 10 to 15 percent slopes	Very limited	Madison (97%)	Too steep for surface application (1.00)	80.4	24.3%
				Too steep for sprinkler irrigation (1.00)		
				Too acid (0.77)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
MdE	Madison sandy loam, 15 to 25 percent slopes	Very limited	Madison (97%)	Too steep for surface application (1.00)	113.1	34.2%
				Too steep for sprinkler irrigation (1.00)		
				Too acid (0.77)		
MfD2	Madison sandy clay loam, 10 to 15 percent slopes, moderately eroded	Very limited	Madison, moderately eroded (100%)	Too steep for surface application (1.00)	50.9	15.4%
				Too steep for sprinkler irrigation (1.00)		
				Too acid (0.77)		
PgE2	Pacolet sandy clay loam, 15 to 25 percent slopes, moderately eroded	Very limited	Pacolet, moderately eroded (98%)	Too steep for surface application (1.00)	0.0	0.0%
				Too steep for sprinkler irrigation (1.00)		
				Too acid (0.77)		
				Low adsorption (0.07)		
To	Toccoa fine sandy loam	Somewhat limited	Toccoa (100%)	Flooding (0.60)	31.9	9.6%
				Too acid (0.42)		
				Depth to saturated zone (0.02)		
W	Water	Not rated	Water (100%)		1.0	0.3%
Totals for Area of Interest					**331.0**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	298.1	90.1%
Somewhat limited	31.9	9.6%
Null or Not Rated	1.0	0.3%
Totals for Area of Interest	**331.0**	**100.0%**

Description

Slow rate treatment of wastewater is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water may percolate to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented either through control of the application rate or through the use of tile drains, or both.

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. The effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, and the application of waste. The properties that affect absorption include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, saturated hydraulic conductivity (Ksat), depth to bedrock or a cemented pan, reaction, the cation-exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. The wind erodibility group, soil erosion factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and

moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix F:
Industrial Flow Documentation

Michael McCracken

From: John Phillips <ptsengineeringinc@gmail.com>
Sent: Wednesday, March 20, 2024 1:23 PM
To: David Tyre; Ken Bryan; Michael McCracken
Subject: Fwd: Fw: New Rendering plant loadings - 4x Douglas

David,

Does this help?
Please let me know if you need anything else.

Thank you,

John

PTS, Inc.
John Phillips, PE
706-680-0999

---------- Forwarded message ---------
From: **Lee Moore** <levydmoore@yahoo.com>
Date: Wed, Mar 20, 2024 at 11:23 AM
Subject: Fw: New Rendering plant loadings - 4x Douglas
To: John Phillips <ptsengineeringinc@gmail.com>

Sent from Yahoo Mail for iPhone

Begin forwarded message:

On Wednesday, March 20, 2024, 11:23 AM, Lee Moore <levydmoore@yahoo.com> wrote:

> Yes. Thank you
>
> Sent from Yahoo Mail for iPhone
>
> On Wednesday, March 20, 2024, 10:24 AM, Glover, Mark <Mark.Glover@pilgrims.com> wrote:

We estimated being around 1 million GPD. This would give us capacity to grow. Is this what you are looking for?

From: Paulsen, Brian <Brian.Paulsen@pilgrims.com>
Sent: Wednesday, March 20, 2024 10:15 AM
To: Glover, Mark <Mark.Glover@pilgrims.com>
Subject: FW: New Rendering plant loadings - 4x Douglas

Mark :

The forward is from Wade Tanner on the designed concentration loadings from the Douglas Plant . If the Franklin Springs facility is going to 4 times larger than the Douglas Facility all the engineer has to do is multiply these numbers by 4 to get a design estimate . The best numbers will come from Douglas at once we reach steady state operations. Also , if we install our anaerobic digester system in front of the city treatment plant these numbers will be different . More ammonia , less BOD, less FOG, lower TSS, reduction in TP possible.

Will this help.

Brian

Brian Paulsen

Head of Environmental Engineering

Brian.Paulsen@pilgrims.com

660-748-5468

Our foundation & our strength is in our values

From: Wade Tanner <wtanner@reidengineering.com>
Sent: Monday, March 18, 2024 2:16 PM
To: Paulsen, Brian <Brian.Paulsen@pilgrims.com>
Cc: Wade Tanner <wtanner@reidengineering.com>
Subject: [Ext]- New Rendering plant loadings - 4x Douglas

Brian,

Following up on your call from Friday.

The Douglas WWPTS was designed for MDF of 300,000 gpd and a production capacity of 10M#rm/wk.

Below is a high level breakdown of the 300,000 gpd flow volume:

Pretreatment DAF Effluent = 70,000 gpd

Condensate and Scrubber ww = 163,000 gpd

Other (stormwater and misc.) = 67,000 gpd

If you are looking for ball park estimates for total flow and loadings to the WWPTS for a plant 4 times the size of Douglas, the flows and pollutant loadings for Douglas could be multiplied by 4.

Table #6 below is a summary of the flows and loadings going to the DAF at Douglas.

Table #6
Summary of Estimated Wastewater Pollutant Loadings and Concentration
FET #1 Influent in Raw Wastewater Sources

Wastewater Source	WW Flow Volume gpd[1]	Pollutant Loadings (			
		BOD	TKN	O&G	Ammor
SPN Condensate WW	26,160	4,473	283	61	11
Blood Serum WW	18,247	1,600	234	1.0	139
Washdown Plant Sanitation WW	20,766	3,551	225	173	9
Truck Drainage WW	2,014	345	22	17	1.0
Total Flow or Loading	67,187	9,969	764	25	160
Total Concentration (mg/L)[2]		17,791	1,363	450	286

[1]from Table #2
[2]Total Concentration = Total Loading ÷ (8.34 x 0.0672 MGD)

Table #11 below is a summary of the flows and loadings going to the biological plant (influent to the 7-Day FET).

Table #11
Summary of Estimated Wastewater Pollutant Loadings and Concentrations in FET

Wastewater Source	WW Flow Volume gpd[1]	Pollutant Loadings			
		BOD	TKN	O&G	Ammo
Condensate and Scrubber[2]	0.163	6,164	1,298	127	1,19
DAF Cell Effluent including SPN[3]	0.07	5,254	555	53	16
Industrial Stormwater[4]	0.0513	77	103	64	98
Other Misc. Sources[5]	0.015	[8]	[8]	[8]	[8]
Total Flow and Loading	0.30	11,495	1,956	244	1,43
Total Concentration (mg/L)[2]		4,600	782	98	58

[1]Pollutant Loadings are on Production Days, 5.5 days to 6.5 days/week
[2]From Table #5
[3]From Table #10
[4]From Table #4
[5]From Table #4
[6]From Table #4

Thank You,

Wade Tanner, P.E. |Director of Engineering
Reid Engineering, Co. Inc.| *Responsible Engineering*

1210 Princess Anne Street | Fredericksburg, VA 22401
Phone (w) 540-371-8500 (c) 540-903-8751 (f) 540-371-8576

www.reidengineering.com

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Appendix G:
LAS Calculations

Franklin Springs, Georgia
Land Application System Feasibility (1.5 MGD)

Preliminary Wetted Area Calculations
Area of Existing Sprayfields is
(Assumes Area Required for Water Balance Storage is 0 acres)

ADF =	**1,500,000**	gpd	Design Average Daily Flow
WLR =	**1.60**	in/wk	Wastewater Loading Rate (Must be ≤ 2.5 in/wk)
Storage $_{WW/E}$ =	**12**	days	Days of Wet Weather & Emergency Storage
Storage $_{OP}$ =	**0**	days	Operational Storage

$A_{(ADF)}$ = (7 days flow/wk) x (ADF gpd) x (12 in./ft) / (7.48 gal/cf) x (43,560 sq.ft/acre) x (WLR in/wk)

$$A_{(ADF)} = \frac{(7 \text{ days flow/wk}) \times (1500000 \text{ gpd}) \times (12 \text{ in./ft})}{(7.48 \text{ gal/cf}) \times (43{,}560 \text{ sq.ft/acre}) \times (1.6 \text{ in/wk})} = 241.69 \text{ acres}$$

$A_{(WW/E)}$ = (WW/E Days) x (ADF gpd) x (7 days flow/wk) x (12 in./ft) / (90 days) x (7.48 gal/cf) x (43,560 sq.ft/acre) x (WLR in/wk)

$$A_{(WW/E)} = \frac{(12 \text{ days}) \times (1500000 \text{ gpd}) \times (7 \text{ days flow/wk}) \times (12 \text{ in./ft})}{(90 \text{ days}) \times (7.48 \text{ gal/cf}) \times (43{,}560 \text{ sq.ft/acre}) \times (1.6 \text{ in/wk})} = 32.23 \text{ acres}$$

$A_{(OP)}$ = (OP Days) x (ADF gpd) x (7 days flow/wk) x (12 in./ft) / (90 days) x (7.48 gal/cf) x (43,560 sq.ft/acre) x (WLR in/wk)

$$A_{(OP)} = \frac{(0 \text{ days}) \times (1500000 \text{ gpd}) \times (7 \text{ days flow/wk}) \times (12 \text{ in./ft})}{(90 \text{ days}) \times (7.48 \text{ gal/cf}) \times (43{,}560 \text{ sq.ft/acre}) \times (1.6 \text{ in/wk})} = 0.00 \text{ acres}$$

Total Estimated Wetted Area = 273.92 acres

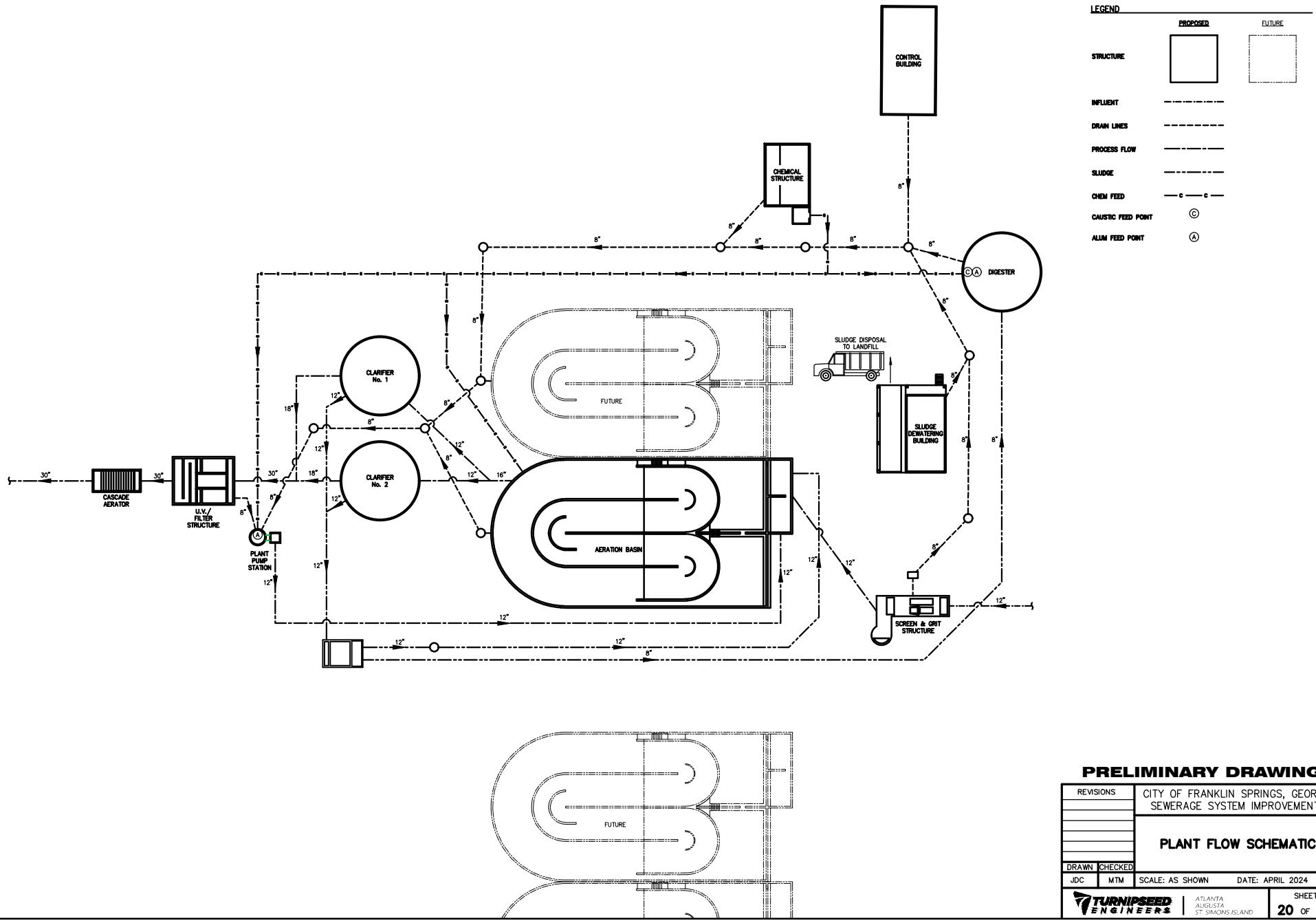
$A_{(BUFFER)} = A_{(TOTAL)} - A_{(WETTED)}$ = **117 acres**

$A_{(BUFFER)} = A_{(TOTAL)} \times 30\%$

$A_{(TOTAL)} = A_{(WETTED)} + A_{(BUFFER)}$

$$A_{(TOTAL)} = \frac{A_{(wetted)}}{0.7} = \textbf{391 acres}$$

Appendix H:
Plant Flow Schematic



PRELIMINARY DRAWING

REVISIONS	CITY OF FRANKLIN SPRINGS, GEORGIA SEWERAGE SYSTEM IMPROVEMENTS
	PLANT FLOW SCHEMATIC
DRAWN: JDC	CHECKED: MTM
SCALE: AS SHOWN	DATE: APRIL 2024

TURNIPSEED ENGINEERS | ATLANTA AUGUSTA ST. SIMONS ISLAND

SHEET 20 OF 94

P:\Franklin Springs\232651 Franklin Springs WPCP\Drawings\232651 Plant Flow Schematic.dwg

Appendix I:
Recent Property Sale Values

Parcel ID		Address	Sale Date	Sale Price	Qualified Sales	Acres	Parcel Class	Assessed Value	Price / Acre
019	025	2969 HWY 320	3/21/2024	$1,224,349.00	Qualified	128.07	Agricultural	$653,007.00	$ 9,560.00
046	066	2245 CASEY RD	11/27/2023	$385,516.00	Qualified	62.18	Consv Use	$307,122.00	$ 6,200.00
048	135	SANDY CROSS RD	9/8/2023	$357,500.00	Qualified	65.18	Agricultural	$332,418.00	$ 5,484.81
003	007	565 BANKS ACADEMY RD	8/31/2023	$1,000,000.00	Qualified	112.23	Consv Use	$706,900.00	$ 8,910.27
028	005	524 GOOLSBY RD	7/14/2023	$420,000.00	Qualified	57.87	Consv Use	$336,767.00	$ 7,257.65
008	041	3300 WILLIAMS BRIDGE RD	5/31/2023	$480,000.00	Qualified	55.32	Consv Use	$411,482.00	$ 8,676.79
028	080 D	GAINESVILLE ST	4/14/2023	$445,000.00	Qualified	74.91	Consv Use	$442,250.00	$ 5,940.46
034	075	CLARKS CREEK RD	4/12/2023	$287,357.00	Qualified	125.49	Agricultural	$413,998.00	$ 2,289.88
049	054	6045 HWY 29	1/10/2023	$1,450,000.00	Qualified	101.53	Agricultural	$851,224.00	$ 14,281.49
								Average	$ 7,622.37

Appendix J:
LAS Site Map

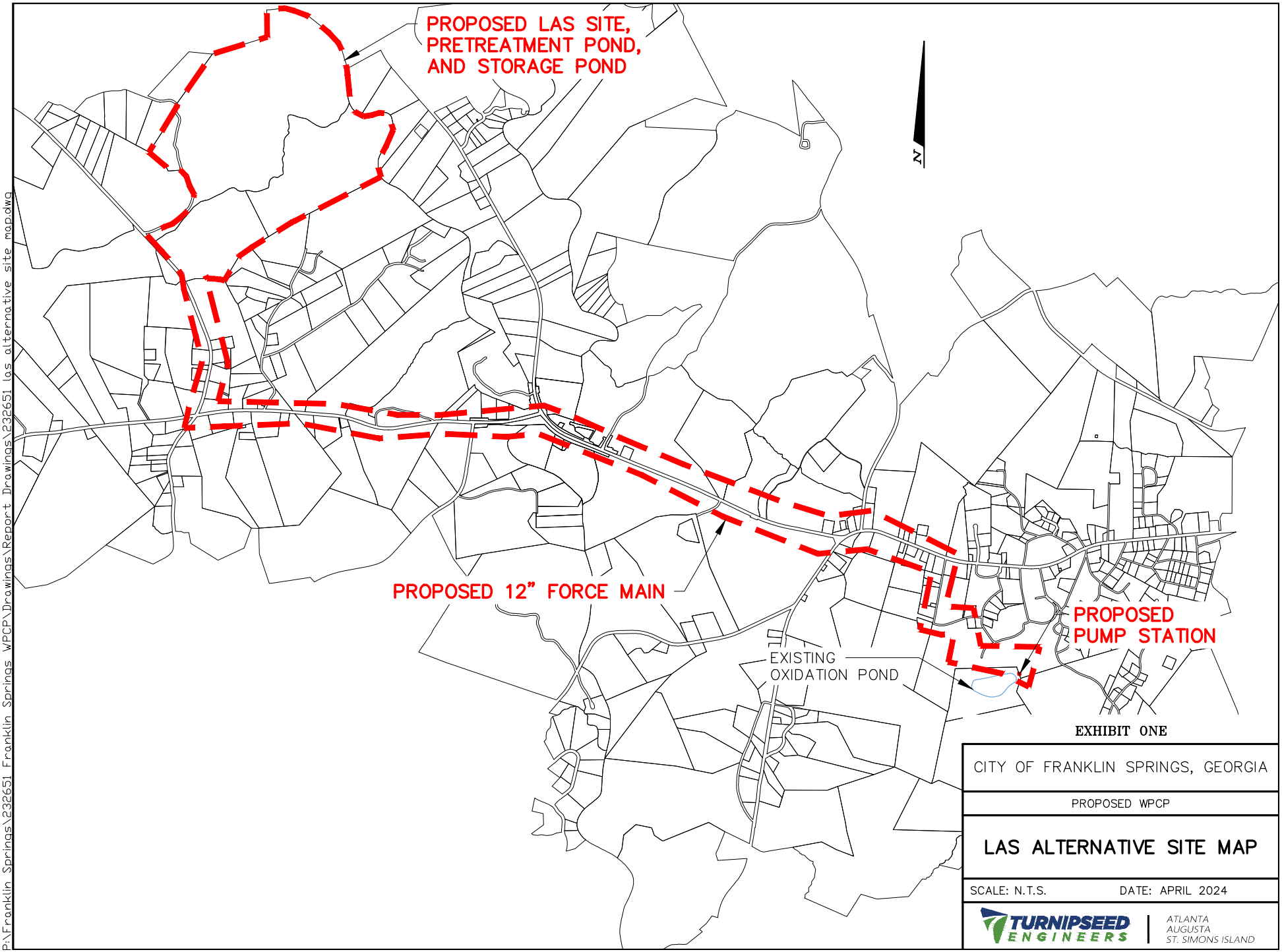


EXHIBIT ONE

CITY OF FRANKLIN SPRINGS, GEORGIA

PROPOSED WPCP

LAS ALTERNATIVE SITE MAP

SCALE: N.T.S. DATE: APRIL 2024

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P:\Franklin Springs\232651 Franklin Springs WPCP\Drawings\Report Drawings\232651 las alternative site map.dwg