Genesee County Economic Development Center

Power People Incentives

June 29, 2020

Re: State Environmental Quality Review Act Update for Proposed Improvements to Western New York Science & Technology Advanced Manufacturing Park

Dear Interested or Involved Agency:

The Genesee County Industrial Development Agency d/b/a the Genesee County Economic Development Center ("**GCEDC**"), in conjunction with the Genesee Gateway Local Development Corporation ("**GGLDC**"), the non-profit real estate affiliate of the GCEDC, have been working to develop the Western New York Science & Technology Advanced Manufacturing Park ("**STAMP**" or the "**Project**"), an advanced manufacturing technology campus on approximately 1,262 acres located on the west side of New York State Route 63/77, approximately five miles north of the I-90/New York State Thruway ("**Site**") in the Town of Alabama, New York ("**Town**"). STAMP is intended to be an economic development engine, providing opportunities for economic growth unlike any other in the greater Buffalo/Niagara and Rochester regions. At full build out, STAMP will feature 6.1 million square feet of development in a natural, sustainable, campus setting. The development on the Site will accommodate various uses such as technology and manufacturing facilities, tech space, agri-businesses, support facilities, office space and ancillary retail. STAMP was specifically designed to accommodate world-class, high-tech companies and as such, it focuses on attracting large, technology advanced manufacturing tenants, with an emphasis on tenants operating in renewable energy industries.

Over the past ten years, STAMP has undergone extensive environmental review pursuant to the State Environmental Quality Review Act ("**SEQR**"). In 2009, the GCEDC declared its intent to act as lead agency for coordinated review of the Project. Thereafter, in its capacity as lead agency, the GCEDC issued a positive declaration determining that the Project may have a potential significant adverse impact on the environment. Pursuant to such positive declaration a generic environmental impact statement was prepared for the Project. The GCEDC accepted a Draft Generic Environmental Impact Statement in 2011 and subsequently issued a Final Generic Environmental Impact Statement (collectively "**GEIS**") in 2012. Ultimately, following thorough consideration of the issues presented in the GEIS, the GCEDC issued a

findings statement ("**Findings Statement**") approving the Project and committing to its undertaking. In 2013, a Smart Growth Impact Statement was prepared which provided comprehensive analysis of New York's Smart Growth criteria.

In 2016, a number of changes were made to the Project, including proposed changes to the Master Plan ("**2016 Project Changes**"), which further reduced impacts to on-Site wetlands. The Project Changes necessitated further environmental review and such review was undertaken by the GCEDC to determine whether the Project Changes would result in any significant adverse environmental impacts not previously addressed in the GEIS. ("**2016 SEQR Update**") Following a coordination process to re-establish itself as the lead agency, after careful review of the Project Changes, GCEDC, issued an amended findings statement that considered each of the Project Changes and found that any potential adverse environmental impact has been adequately analyzed in the GEIS and sufficiently addressed in the Findings Statement.

In August of 2019, the GCEDC circulated a notice of intent to re-establish itself as lead agency for purposes of evaluating certain infrastructure modifications to the Project. All involved agencies consented to the GCEDC acting as lead agency and thus, the GCEDC has properly been re-established as the lead agency for purposes of these infrastructure improvements. Since last August, there have been some changes to the infrastructure plans based on various factors including an effort to mitigate potential adverse environmental impacts. There have also been some other Project related changes that the GCEDC is obligated to consider in an updated SEQR process. Thus, the GCEDC is now providing a revised description of the current proposed Project modifications for purposes of an updated SEQR process (hereinafter, "**Project Modifications**"). *See* **Exhibit A**.

GCEDC, as lead agency for the Project, is distributing copies of relevant information to assist interested and involved agencies in providing comments to the lead agency about potential adverse environmental impacts associated with the Project Modifications. This information includes the following:

Exhibit	Description
Exhibit A:	Description of Project Modifications
Exhibit B:	Full Environmental Assessment Form
Exhibit C:	Updated List of Interested and Involved Agencies

In addition, the following reports are provided on the enclosed disc:

- Force Main, Main Pump Station, & Onsite WWTF Basis of Design Report
- STAMP 6 MGD Water Basis of Design Report
- Oak Orchard Hydraulic Report
- Iroquois National Wildlife Refuge ROW Environmental Assessment

- STAMP Water Main & Wastewater Wetland & Stream Delineation Summary

Interested and involved agencies are encouraged to review the materials contained herein and provide comments to the GCEDC relative to the proposed Project Modifications and/or potential adverse environmental impacts related to same.

Lead Agency Contact Person:
Mark Masse,
Senior Vice President of Operations
99 MedTech Drive, Suite 106
Batavia, New York 14020
Telephone: (585) 343-4866, ext. 17.
Email: mmasse@gcedc.com

Sincerely,

Genesee County Economic Development Center

By:

Mark A. Masse, CPA
Senior Vice President of Operations

cc: Adam Walters, Esq.

The Project Modifications include all actions necessary to undertake the following:

- Construction of a wastewater treatment facility ("WWTF") on the STAMP Site within the utility infrastructure area to treat the sanitary wastewater generated by STAMP's manufacturing and other tenants. The WWTF will not treat the manufacturing tenants' process wastewater, rather the tenants will treat their own process wastewaters directly before discharging to the main pump station wet well. The main pump station will then pump the combined flows through a proposed force main ("Force Main") to a new discharge point to be located on Oak Orchard Creek in the Town of Shelby, Orleans County, New York.

- Construction of the Force Main which involves the installation of approximately 44,750 linear feet of sanitary force main, metering vaults, and maintenance manholes. The vast majority of installation of sewer related infrastructure will be along public roads via a combination of open cut method and directional drill methods. The Force Main will convey up to six (6) million gallons per day ("MGD") of treated wastewater from the STAMP Site to a new discharge in Oak Orchard Creek.

- A new water main ("Water Main") of approximately 23,000 linear feet to be installed along the Lewiston Road right of way between the Genesee County line with Niagara County and the STAMP Site. The new water main will bring up to six (6) MGD of water from the Niagara County Water District ("NCWD") to the STAMP Site.

- The development of an approximate 20 acre parcel located immediately north of STAMP. This landlocked parcel lies between the STAMP Site and a utility corridor which houses the Empire Pipeline and a 345 KV Power Line which will ultimately supply power to STAMP tenants. This parcel is located to the west of the intersection of Lewiston Road (NYS Route 77) and Crosby Road in the Town of Alabama and is bounded by the Empire Pipeline/345 KV Power Line utility corridor to the north, hedgerows to the east and south, and woods and brush to the west. It is anticipated that this parcel will be the site of an electrical substation.

Full Environmental Assessment Form
Part 1 - Project and Setting

Instructions for Completing Part 1

Part 1 is to be completed by the applicant or project sponsor. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification.

Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information; indicate whether missing information does not exist, or is not reasonably available to the sponsor; and, when possible, generally describe work or studies which would be necessary to update or fully develop that information.

Applicants/sponsors must complete all items in Sections A & B. In Sections C, D & E, most items contain an initial question that must be answered either "Yes" or "No". If the answer to the initial question is "Yes", complete the sub-questions that follow. If the answer to the initial question is "No", proceed to the next question. Section F allows the project sponsor to identify and attach any additional information. Section G requires the name and signature of the applicant or project sponsor to verify that the information contained in Part 1is accurate and complete.

A. Project and Applicant/Sponsor Information.

<table>
<tr><td colspan="3">Name of Action or Project:
STAMP WWTF, FM, Substation, and Water Supply</td></tr>
<tr><td colspan="3">Project Location (describe, and attach a general location map):
Town of Alabama, Genesee County, NY; Town of Shelby, Orleans County, NY</td></tr>
<tr><td colspan="3">Brief Description of Proposed Action (include purpose or need):
See description, attached</td></tr>
<tr><td rowspan="2">Name of Applicant/Sponsor:
Genesee Gateway Local Development Corp. and the Genesee County Industrial Development Agency d/b/a Genesee County Economic Development Center</td><td colspan="2">Telephone: (585) 343-4866</td></tr>
<tr><td colspan="2">E-Mail: mmasse@gcedc.com</td></tr>
<tr><td colspan="3">Address: 99 Medtech Drive</td></tr>
<tr><td>City/PO: Batavia</td><td>State: NY</td><td>Zip Code: 14020</td></tr>
<tr><td rowspan="2">Project Contact (if not same as sponsor; give name and title/role):</td><td colspan="2">Telephone:</td></tr>
<tr><td colspan="2">E-Mail:</td></tr>
<tr><td colspan="3">Address:</td></tr>
<tr><td>City/PO:</td><td>State:</td><td>Zip Code:</td></tr>
<tr><td rowspan="2">Property Owner (if not same as sponsor):
See property owner list, attached</td><td colspan="2">Telephone:</td></tr>
<tr><td colspan="2">E-Mail:</td></tr>
<tr><td colspan="3">Address:</td></tr>
<tr><td>City/PO:</td><td>State:</td><td>Zip Code:</td></tr>
</table>

B. Government Approvals

B. Government Approvals, Funding, or Sponsorship. ("Funding" includes grants, loans, tax relief, and any other forms of financial assistance.)

Government Entity	If Yes: Identify Agency and Approval(s) Required	Application Date (Actual or projected)
a. City Counsel, Town Board, or Village Board of Trustees ☑Yes ☐No	Town Board: Shelby, Alabama	TBD
b. City, Town or Village Planning Board or Commission ☑Yes ☐No	Town of Alabama Site Plan Review	TBD
c. City, Town or Village Zoning Board of Appeals ☐Yes ☑No		
d. Other local agencies ☑Yes ☐No	See Appendix	TBD
e. County agencies ☑Yes ☐No	Genesee County Highway, Orleans County Highway. See SEQR Update, Appendix	TBD
f. Regional agencies ☑Yes ☐No	See Appendix	TBD
g. State agencies ☑Yes ☐No	NYSDOT-Right of Way/Access, NYSDAM-NOI, NYSDEC, PSC	TBD
h. Federal agencies ☑Yes ☐No	USFWS, INWR, USACE	

i. Coastal Resources.

i. Is the project site within a Coastal Area, or the waterfront area of a Designated Inland Waterway? ☐Yes ☑No

ii. Is the project site located in a community with an approved Local Waterfront Revitalization Program? ☐Yes ☑No

iii. Is the project site within a Coastal Erosion Hazard Area? ☐Yes ☑No

C. Planning and Zoning

C.1. Planning and zoning actions.

Will administrative or legislative adoption, or amendment of a plan, local law, ordinance, rule or regulation be the only approval(s) which must be granted to enable the proposed action to proceed? ☐Yes ☑No

- **If Yes,** complete sections C, F and G.
- **If No,** proceed to question C.2 and complete all remaining sections and questions in Part 1

C.2. Adopted land use plans.

a. Do any municipally- adopted (city, town, village or county) comprehensive land use plan(s) include the site where the proposed action would be located? ☑Yes ☐No

If Yes, does the comprehensive plan include specific recommendations for the site where the proposed action would be located? ☑Yes ☐No

b. Is the site of the proposed action within any local or regional special planning district (for example: Greenway; Brownfield Opportunity Area (BOA); designated State or Federal heritage area; watershed management plan; or other?) ☑Yes ☐No

If Yes, identify the plan(s):

NYS Heritage Areas:West Erie Canal Corridor, Federal Recreation Land:Iroquois National Wildlife Refuge

c. Is the proposed action located wholly or partially within an area listed in an adopted municipal open space plan, or an adopted municipal farmland protection plan? ☑Yes ☐No

If Yes, identify the plan(s):

Genesee County Agricultural and Farmland Protection Plan

C.3. Zoning

a. Is the site of the proposed action located in a municipality with an adopted zoning law or ordinance. ☑ Yes ☐ No
If Yes, what is the zoning classification(s) including any applicable overlay district?

Road Right of Way (FM, Water). Zoning classifications: Technology District (STAMP Site, FM, Water, Substation; TD-1 & TD-2, Town of Alabama), Agricultural Residential (FM, Water; A-R, Town of Alabama, Town of Shelby), Residential (FM, Water; R, Town of Alabama), Commercial (FM; C, Town of Alabama), Land Conservation (FM, Water; LC, Town of Alabama), General Business (FM, Town of Shelby)

b. Is the use permitted or allowed by a special or conditional use permit? Road Right of Way (ROW) ☑ Yes ☐ No

c. Is a zoning change requested as part of the proposed action? ☐ Yes ☑ No
If Yes,
i. What is the proposed new zoning for the site? _____

C.4. Existing community services.

a. In what school district is the project site located? Oakfield-Alabama School District, Medina Central School District

b. What police or other public protection forces serve the project site?
Genesee County Sheriff's Office, Orleans County Sheriff's Office

c. Which fire protection and emergency medical services serve the project site?
Town of Alabama Fire Department; Genesee County Emergency Management Services (EMS), Orleans County EMS, Medina Fire Department, Shelby Fire Department

d. What parks serve the project site?
N/A

D. Project Details

D.1. Proposed and Potential Development

a. What is the general nature of the proposed action (e.g., residential, industrial, commercial, recreational; if mixed, include all components)? Industrial

b. a. Total acreage of the site of the proposed action? 43 acres (10 Acres ROW + 16 acre utility infrastructure area within STAMP Site + 17 acre substation parcel)
b. Total acreage to be physically disturbed? 43 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? Road ROW + 1,262 acres (Entire STAMP Site (1,262 acres))

c. Is the proposed action an expansion of an existing project or use? ☐ Yes ☑ No
i. If Yes, what is the approximate percentage of the proposed expansion and identify the units (e.g., acres, miles, housing units, square feet)? % _____ Units: _____

d. Is the proposed action a subdivision, or does it include a subdivision? ☐ Yes ☑ No
If Yes,
i. Purpose or type of subdivision? (e.g., residential, industrial, commercial; if mixed, specify types)
ii. Is a cluster/conservation layout proposed? ☐ Yes ☑ No
iii. Number of lots proposed? _____
iv. Minimum and maximum proposed lot sizes? Minimum _____ Maximum _____

e. Will the proposed action be constructed in multiple phases? ☑ Yes ☐ No
i. If No, anticipated period of construction: 12 months
ii. If Yes:
- Total number of phases anticipated 3
- Anticipated commencement date of phase 1 (including demolition) _____ month _____ year
- Anticipated completion date of final phase _____ month _____ year
- Generally describe connections or relationships among phases, including any contingencies where progress of one phase may determine timing or duration of future phases: Onsite WWTF will be constructed in phases in response to increased generation of wastewater by manufacturing tenants occupying the site.

f. Does the project include new residential uses? ☐ Yes ☑ No

If Yes, show numbers of units proposed.

	One Family	Two Family	Three Family	Multiple Family (four or more)
Initial Phase				
At completion of all phases				

g. Does the proposed action include new non-residential construction (including expansions)? ☑ Yes ☐ No

If Yes,

i. Total number of structures 4

ii. Dimensions (in feet) of largest proposed structure: 10 height; 114 width; and 94 length

iii. Approximate extent of building space to be heated or cooled: 4,600 square feet

h. Does the proposed action include construction or other activities that will result in the impoundment of any liquids, such as creation of a water supply, reservoir, pond, lake, waste lagoon or other storage? ☑ Yes ☐ No

If Yes,

i. Purpose of the impoundment: Stormwater Runoff Retention

ii. If a water impoundment, the principal source of the water: ☐ Ground water ☐ Surface water streams ☑ Other specify: Stormwater surface runoff

iii. If other than water, identify the type of impounded/contained liquids and their source.
N/A

iv. Approximate size of the proposed impoundment. Volume: <1 million gallons; surface area: 1.5 +/- acres

v. Dimensions of the proposed dam or impounding structure: 6 - 8 height; N/A length

vi. Construction method/materials for the proposed dam or impounding structure (e.g., earth fill, rock, wood, concrete):
N/A

D.2. Project Operations

a. Does the proposed action include any excavation, mining, or dredging, during construction, operations, or both? (Not including general site preparation, grading or installation of utilities or foundations where all excavated materials will remain onsite) ☐ Yes ☑ No

If Yes:

i .What is the purpose of the excavation or dredging?

ii. How much material (including rock, earth, sediments, etc.) is proposed to be removed from the site?

- Volume (specify tons or cubic yards):
- Over what duration of time?

iii. Describe nature and characteristics of materials to be excavated or dredged, and plans to use, manage or dispose of them.

iv. Will there be onsite dewatering or processing of excavated materials? ☐ Yes ☐ No
If yes, describe.

v. What is the total area to be dredged or excavated? acres

vi. What is the maximum area to be worked at any one time? acres

vii. What would be the maximum depth of excavation or dredging? feet

viii. Will the excavation require blasting? ☐ Yes ☐ No

ix. Summarize site reclamation goals and plan:

b. Would the proposed action cause or result in alteration of, increase or decrease in size of, or encroachment into any existing wetland, waterbody, shoreline, beach or adjacent area? ☑ Yes ☐ No

If Yes:

i. Identify the wetland or waterbody which would be affected (by name, water index number, wetland map number or geographic description): Portions of the force main will be installed with horizontal directional drilling methods to avoid impacts to several wetlands along force main route, see location map. Outlet structure will be installed in Oak Orchard Creek (0301-0014). Portions of the water main will be installed with horizontal directional drilling methods to avoid impacts to several wetlands along force main route, see location map.

ii. Describe how the proposed action would affect that waterbody or wetland, e.g. excavation, fill, placement of structures, or alteration of channels, banks and shorelines. Indicate extent of activities, alterations and additions in square feet or acres:
Temporary disturbance during construction. Project impacts to wetlands will be mitigated by horizontal direction drilling installation methods through all wetland and stream crossings. Outlet structure will be installed using open cut methods in the stream. Temporary dewatering will be required using a temporary cofferdam. Following construction, the creek bed will be restored using native materials.

iii. Will the proposed action cause or result in disturbance to bottom sediments? ☑ Yes ☐ No
If Yes, describe: Outlet structure installation in Oak Orchard Creek will require streambank restoration after construction

iv. Will the proposed action cause or result in the destruction or removal of aquatic vegetation? ☑ Yes ☐ No
If Yes:

- acres of aquatic vegetation proposed to be removed: 0.02
- expected acreage of aquatic vegetation remaining after project completion: 0.015
- purpose of proposed removal (e.g. beach clearing, invasive species control, boat access):
  To install a new outlet structure to discharge treated wastewaters to Oak Orchard Creek.
- proposed method of plant removal: physical removal
- if chemical/herbicide treatment will be used, specify product(s):

v. Describe any proposed reclamation/mitigation following disturbance:
Creek bed will be restored using native materials. Concrete encasement will be covered with boulders/rip rap found on site.

c. Will the proposed action use, or create a new demand for water? ☑ Yes ☐ No
If Yes:

i. Total anticipated water usage/demand per day: 6,000,000 gallons/day

ii. Will the proposed action obtain water from an existing public water supply? ☑ Yes ☐ No
If Yes:

- Name of district or service area: Niagara County Water District
- Does the existing public water supply have capacity to serve the proposal? Currently under design ☐ Yes ☑ No
- Is the project site in the existing district? ☐ Yes ☑ No
- Is expansion of the district needed? ☐ Yes ☑ No
- Do existing lines serve the project site? ☐ Yes ☑ No

iii. Will line extension within an existing district be necessary to supply the project? ☑ Yes ☐ No
If Yes:

- Describe extensions or capacity expansions proposed to serve this project:
  23,000 LF of transmission main from the Niagara County border to the STAMP site
- Source(s) of supply for the district: Niagara County Water District

iv. Is a new water supply district or service area proposed to be formed to serve the project site? ☑ Yes ☐ No
If, Yes:

- Applicant/sponsor for new district: Genesee Gateway Local Development Corp. to form a STAMP Water Works Corp. and water district
- Date application submitted or anticipated: TBD
- Proposed source(s) of supply for new district: Niagara County Water District

v. If a public water supply will not be used, describe plans to provide water supply for the project:

vi. If water supply will be from wells (public or private), what is the maximum pumping capacity: _____ gallons/minute.

d. Will the proposed action generate liquid wastes? ☑ Yes ☐ No
If Yes:

i. Total anticipated liquid waste generation per day: 6,000,000 gallons/day

ii. Nature of liquid wastes to be generated (e.g., sanitary wastewater, industrial; if combination, describe all components and approximate volumes or proportions of each):
Treated sanitary wastewater up to 1 MGD and treated industrial wastewater up to 5 MGD, including up to 2.7 MGD of non-contact cooling water

iii. Will the proposed action use any existing public wastewater treatment facilities? ☐ Yes ☑ No
If Yes:

- Name of wastewater treatment plant to be used:
- Name of district:
- Does the existing wastewater treatment plant have capacity to serve the project? ☐ Yes ☐ No
- Is the project site in the existing district? ☐ Yes ☐ No
- Is expansion of the district needed? ☐ Yes ☐ No

- Do existing sewer lines serve the project site? ☐Yes ☑No
- Will a line extension within an existing district be necessary to serve the project? ☑Yes ☐No

  If Yes:
  - Describe extensions or capacity expansions proposed to serve this project: A new force main will be constructed to convey treated sanitary from the Onsite WWTF and treated process wastewater from the STAMP site to the new discharge point in Oak Orchard Creek.

iv. Will a new wastewater (sewage) treatment district be formed to serve the project site? ☑Yes ☐No

If Yes:
- Applicant/sponsor for new district: GENESEE GATEWAY LOCAL DEVELOPMENT CORPORATION (GGLDC)
- Date application submitted or anticipated: TBD
- What is the receiving water for the wastewater discharge? OAK ORCHARD CREEK, UPPER, AND TRIBUTARIES

v. If public facilities will not be used, describe plans to provide wastewater treatment for the project, including specifying proposed receiving water (name and classification if surface discharge or describe subsurface disposal plans):
Discharge to OAK ORCHARD CREEK, UPPER, AND TRIBUTARIES (PWL ID 0301-0014) Class C Stream

vi. Describe any plans or designs to capture, recycle or reuse liquid waste: _____

e. Will the proposed action disturb more than one acre and create stormwater runoff, either from new point sources (i.e. ditches, pipes, swales, curbs, gutters or other concentrated flows of stormwater) or non-point source (i.e. sheet flow) during construction or post construction? ☑Yes ☐No

If Yes:

i. How much impervious surface will the project create in relation to total size of project parcel?

_____ Square feet or 9.7 acres (impervious surface) 1.7 acre from Utility Infrastructure Area + 8 acres from Substation Parcel

_____ Square feet or 43 acres (parcel size) 10 Acre ROW + 16 acre Utility Infrastructure Area + 17 acre Substation Parcel

ii. Describe types of new point sources. _____

iii. Where will the stormwater runoff be directed (i.e. on-site stormwater management facility/structures, adjacent properties, groundwater, on-site surface water or off-site surface waters)?
On-site stormwater management facility

- If to surface waters, identify receiving water bodies or wetlands: _____
- Will stormwater runoff flow to adjacent properties? ☐Yes ☑No

iv. Does the proposed plan minimize impervious surfaces, use pervious materials or collect and re-use stormwater? ☑Yes ☐No

f. Does the proposed action include, or will it use on-site, one or more sources of air emissions, including fuel combustion, waste incineration, or other processes or operations? ☐Yes ☑No

If Yes, identify:

i. Mobile sources during project operations (e.g., heavy equipment, fleet or delivery vehicles)

ii. Stationary sources during construction (e.g., power generation, structural heating, batch plant, crushers)

iii. Stationary sources during operations (e.g., process emissions, large boilers, electric generation)

g. Will any air emission sources named in D.2.f (above), require a NY State Air Registration, Air Facility Permit, or Federal Clean Air Act Title IV or Title V Permit? ☐Yes ☑No

If Yes:

i. Is the project site located in an Air quality non-attainment area? (Area routinely or periodically fails to meet ambient air quality standards for all or some parts of the year) ☐Yes ☐No

ii. In addition to emissions as calculated in the application, the project will generate:
- _____Tons/year (short tons) of Carbon Dioxide (CO_2)
- _____Tons/year (short tons) of Nitrous Oxide (N_2O)
- _____Tons/year (short tons) of Perfluorocarbons (PFCs)
- _____Tons/year (short tons) of Sulfur Hexafluoride (SF_6)
- _____Tons/year (short tons) of Carbon Dioxide equivalent of Hydroflourocarbons (HFCs)
- _____Tons/year (short tons) of Hazardous Air Pollutants (HAPs)

h. Will the proposed action generate or emit methane (including, but not limited to, sewage treatment plants, landfills, composting facilities)? ☐Yes ☑No
Biosolids from WWTF will be processed with aerobic digestion which will not generate methane.

If Yes:

i. Estimate methane generation in tons/year (metric): _____

ii. Describe any methane capture, control or elimination measures included in project design (e.g., combustion to generate heat or electricity, flaring): _____

_____

i. Will the proposed action result in the release of air pollutants from open-air operations or processes, such as quarry or landfill operations? ☐Yes ☑No

If Yes: Describe operations and nature of emissions (e.g., diesel exhaust, rock particulates/dust):

_____

_____

j. Will the proposed action result in a substantial increase in traffic above present levels or generate substantial new demand for transportation facilities or services? ☐Yes ☑No

If Yes:

i. When is the peak traffic expected (Check all that apply): ☐ Morning ☐ Evening ☐Weekend
☐ Randomly between hours of _____ to _____.

ii. For commercial activities only, projected number of truck trips/day and type (e.g., semi trailers and dump trucks): _____

_____

iii. Parking spaces: Existing _____ Proposed _____ Net increase/decrease _____

iv. Does the proposed action include any shared use parking? ☐Yes ☐No

v. If the proposed action includes any modification of existing roads, creation of new roads or change in existing access, describe:

_____

vi. Are public/private transportation service(s) or facilities available within ½ mile of the proposed site? ☐Yes ☐No

vii Will the proposed action include access to public transportation or accommodations for use of hybrid, electric or other alternative fueled vehicles? ☐Yes ☐No

viii. Will the proposed action include plans for pedestrian or bicycle accommodations for connections to existing pedestrian or bicycle routes? ☐Yes ☐No

k. Will the proposed action (for commercial or industrial projects only) generate new or additional demand for energy? ☑Yes ☐No

If Yes:

i. Estimate annual electricity demand during operation of the proposed action: _____
1,725 kW

ii. Anticipated sources/suppliers of electricity for the project (e.g., on-site combustion, on-site renewable, via grid/local utility, or other):
National Grid, National Fuel

iii. Will the proposed action require a new, or an upgrade, to an existing substation? ☑Yes ☐No

l. Hours of operation. Answer all items which apply.

i. During Construction:

- Monday - Friday: 6:00AM - 6:00 PM
- Saturday: 6:00AM - 6:00 PM
- Sunday: 6:00AM - 6:00 PM
- Holidays: 6:00AM - 6:00 PM

ii. During Operations:

- Monday - Friday: 24 hours/day, 7 days/week
- Saturday: _____
- Sunday: _____
- Holidays: _____

m. Will the proposed action produce noise that will exceed existing ambient noise levels during construction, operation, or both? ☑ Yes ☐ No

If yes:

i. Provide details including sources, time of day and duration:

Slight increase in noise during daylight hours only for the duration of the project as a result of construction equipment. Extent of the increases will likely be contained to property itself. Increased noise during the construction phase will be temporary in nature, limited to the property, and similar in duration and intensity as other commercial construction activities.

ii. Will the proposed action remove existing natural barriers that could act as a noise barrier or screen? ☐ Yes ☑ No

Describe: _____

n. Will the proposed action have outdoor lighting? ☑ Yes ☐ No

If yes:

i. Describe source(s), location(s), height of fixture(s), direction/aim, and proximity to nearest occupied structures:

The utility parcel will include lamp posts to light the entrance to the utility parcel and the vicinity of the WWTF operations for maintenance and emergency situations. Lights will turn off to be Dark Sky Compliant

ii. Will proposed action remove existing natural barriers that could act as a light barrier or screen? ☐ Yes ☑ No

Describe: _____

o. Does the proposed action have the potential to produce odors for more than one hour per day? ☑ Yes ☐ No

If Yes, describe possible sources, potential frequency and duration of odor emissions, and proximity to nearest occupied structures:

WWTF is designed to mitigate odors. Headworks will be enclosed within a building. Biosolids will be processed with aerobic digestion and dewatered within an enclosed building.

p. Will the proposed action include any bulk storage of petroleum (combined capacity of over 1,100 gallons) or chemical products 185 gallons in above ground storage or any amount in underground storage? ☑ Yes ☐ No

If Yes:

i. Product(s) to be stored Aluminum Sulfate (Alum) for chemical phosphorus removal

ii. Volume(s) 1,000 gal per unit time month (e.g., month, year)

iii. Generally, describe the proposed storage facilities:

Storage facilities will include double containment areas in compliance with bulk chemical storage requirements, see BOD report.

q. Will the proposed action (commercial, industrial and recreational projects only) use pesticides (i.e., herbicides, insecticides) during construction or operation? ☐ Yes ☑ No

If Yes:

i. Describe proposed treatment(s):

ii. Will the proposed action use Integrated Pest Management Practices? ☐ Yes ☐ No

r. Will the proposed action (commercial or industrial projects only) involve or require the management or disposal of solid waste (excluding hazardous materials)? ☑ Yes ☐ No

If Yes:

i. Describe any solid waste(s) to be generated during construction or operation of the facility:

- Construction: N/A tons per _____ (unit of time)
- Operation : 1,770 tons per year (unit of time)

ii. Describe any proposals for on-site minimization, recycling or reuse of materials to avoid disposal as solid waste:

- Construction: _____
- Operation: _____

iii. Proposed disposal methods/facilities for solid waste generated on-site:

- Construction: _____
- Operation: The WWTF will produce digested and dewatered biosolids that will be transported to a landfill for disposal

s. Does the proposed action include construction or modification of a solid waste management facility? ☐ Yes ☑ No

If Yes:

i. Type of management or handling of waste proposed for the site (e.g., recycling or transfer station, composting, landfill, or other disposal activities): _____

ii. Anticipated rate of disposal/processing:

- _____ Tons/month, if transfer or other non-combustion/thermal treatment, or
- _____ Tons/hour, if combustion or thermal treatment

iii. If landfill, anticipated site life: _____ years

t. Will the proposed action at the site involve the commercial generation, treatment, storage, or disposal of hazardous waste? ☐ Yes ☑ No

If Yes:

i. Name(s) of all hazardous wastes or constituents to be generated, handled or managed at facility: _____

ii. Generally describe processes or activities involving hazardous wastes or constituents: _____

iii. Specify amount to be handled or generated _____ tons/month

iv. Describe any proposals for on-site minimization, recycling or reuse of hazardous constituents: _____

v. Will any hazardous wastes be disposed at an existing offsite hazardous waste facility? ☐ Yes ☐ No

If Yes: provide name and location of facility: _____

If No: describe proposed management of any hazardous wastes which will not be sent to a hazardous waste facility:

E. Site and Setting of Proposed Action

E.1. Land uses on and surrounding the project site

a. Existing land uses.

i. Check all uses that occur on, adjoining and near the project site.

☐ Urban ☑ Industrial ☑ Commercial ☑ Residential (suburban) ☑ Rural (non-farm)
☑ Forest ☑ Agriculture ☑ Aquatic ☐ Other (specify): _____

ii. If mix of uses, generally describe:

The STAMP site is located on technology district zoned lands (utility parcel is 16 acres, substation parcel is 17 acres). The force main passes through various lands along road right of ways (6 acres). The discharge structure is located within Oak Orchard Creek (0.02 acres). The water main main passes through various lands along road right of ways (4 acres)

b. Land uses and covertypes on the project site.

Land use or Covertype	Current Acreage	Acreage After Project Completion	Change (Acres +/-)
• Roads, buildings, and other paved or impervious surfaces		9.7	+9.7
• Forested			
• Meadows, grasslands or brushlands (non-agricultural, including abandoned agricultural)	43	33.3	-9.7
• Agricultural (includes active orchards, field, greenhouse etc.)			
• Surface water features (lakes, ponds, streams, rivers, etc.)	0.02	0.02	0
• Wetlands (freshwater or tidal)	1.00	1.00	0
• Non-vegetated (bare rock, earth or fill)			
• Other Describe: _____ _____ _____			

c. Is the project site presently used by members of the community for public recreation? ☑ Yes ☐ No

i. If Yes: explain: Upper Oak Orchard Creek is a Class C waterbody, suitable for general recreation use and support of aquatic life, but not as a water supply or for public bathing. Force main will discharge treated wastewater to Oak Orchard Creek at the new discharge location North of Shelby Center

d. Are there any facilities serving children, the elderly, people with disabilities (e.g., schools, hospitals, licensed day care centers, or group homes) within 1500 feet of the project site? ☐ Yes ☑ No

If Yes,

i. Identify Facilities:

_____

_____

e. Does the project site contain an existing dam? ☐ Yes ☑ No

If Yes:

i. Dimensions of the dam and impoundment:

- Dam height: _____ feet
- Dam length: _____ feet
- Surface area: _____ acres
- Volume impounded: _____ gallons OR acre-feet

ii. Dam's existing hazard classification: _____

iii. Provide date and summarize results of last inspection:

_____

_____

f. Has the project site ever been used as a municipal, commercial or industrial solid waste management facility, or does the project site adjoin property which is now, or was at one time, used as a solid waste management facility? ☐ Yes ☑ No

If Yes:

i. Has the facility been formally closed? ☐ Yes ☐ No

- If yes, cite sources/documentation: _____

ii. Describe the location of the project site relative to the boundaries of the solid waste management facility:

_____

_____

iii. Describe any development constraints due to the prior solid waste activities: _____

_____

g. Have hazardous wastes been generated, treated and/or disposed of at the site, or does the project site adjoin property which is now or was at one time used to commercially treat, store and/or dispose of hazardous waste? ☐ Yes ☑ No

If Yes:

i. Describe waste(s) handled and waste management activities, including approximate time when activities occurred:

_____

_____

h. Potential contamination history. Has there been a reported spill at the proposed project site, or have any remedial actions been conducted at or adjacent to the proposed site? ☑ Yes ☐ No

Spill Record Closed 04/14/2004.
Successful remediation of soils

If Yes:

i. Is any portion of the site listed on the NYSDEC Spills Incidents database or Environmental Site Remediation database? Check all that apply: ☑ Yes ☐ No

☑ Yes – Spills Incidents database — Provide DEC ID number(s): 9607396

☐ Yes – Environmental Site Remediation database — Provide DEC ID number(s): _____

☐ Neither database

ii. If site has been subject of RCRA corrective activities, describe control measures: _____

_____

_____

iii. Is the project within 2000 feet of any site in the NYSDEC Environmental Site Remediation database? ☐ Yes ☑ No

If yes, provide DEC ID number(s): _____

iv. If yes to (i), (ii) or (iii) above, describe current status of site(s):

_____

_____

v. Is the project site subject to an institutional control limiting property uses? ☐ Yes ☑ No

- If yes, DEC site ID number: _____
- Describe the type of institutional control (e.g., deed restriction or easement): _____
- Describe any use limitations: _____
- Describe any engineering controls: _____
- Will the project affect the institutional or engineering controls in place? ☐ Yes ☐ No
- Explain: _____

E.2. Natural Resources On or Near Project Site

a. What is the average depth to bedrock on the project site? +5 feet

b. Are there bedrock outcroppings on the project site? ☐ Yes ☑ No
If Yes, what proportion of the site is comprised of bedrock outcroppings? _____ %

c. Predominant soil type(s) present on project site:

Odessa Silt Loam	8.8 %
Ontario Loam	5.9 %
Collamer Silt Loam	5.8 %

d. What is the average depth to the water table on the project site? Average: +/- 1 feet

e. Drainage status of project site soils:

☐	Well Drained:	29.5 % of site
☐	Moderately Well Drained:	24.6 % of site
☑	Poorly Drained	45.9 % of site

f. Approximate proportion of proposed action site with slopes:

☑	0-10%:	88.8 % of site
☐	10-15%:	8.9 % of site
☐	15% or greater:	2.3 % of site

g. Are there any unique geologic features on the project site? ☐ Yes ☑ No
If Yes, describe: _____

h. Surface water features.

i. Does any portion of the project site contain wetlands or other waterbodies (including streams, rivers, ponds or lakes)? ☑ Yes ☐ No

ii. Do any wetlands or other waterbodies adjoin the project site? ☑ Yes ☐ No

If Yes to either *i* or *ii*, continue. If No, skip to E.2.i.

iii. Are any of the wetlands or waterbodies within or adjoining the project site regulated by any federal, state or local agency? ☑ Yes ☐ No

iv. For each identified regulated wetland and waterbody on the project site, provide the following information:

- Streams: Name 837-78, 847-687, 837-76, 847-658, 847-683 Classification C
- Lakes or Ponds: Name _____ Classification _____
- Wetlands: Name Federal Waters, NYS Wetland , Federal Waters,... Approximate Size NYS Wetland
- Wetland No. (if regulated by DEC) AK-3, AK-5

v. Are any of the above water bodies listed in the most recent compilation of NYS water quality-impaired waterbodies? ☐ Yes ☑ No

If yes, name of impaired water body/bodies and basis for listing as impaired: _____

i. Is the project site in a designated Floodway? ☐ Yes ☑ No

j. Is the project site in the 100-year Floodplain? Discharge located in Oak Orchard Creek ☑ Yes ☐ No

k. Is the project site in the 500-year Floodplain? Discharge located in Oak Orchard Creek ☑ Yes ☐ No

l. Is the project site located over, or immediately adjoining, a primary, principal or sole source aquifer? ☐ Yes ☑ No
If Yes:

i. Name of aquifer: _____

m. Identify the predominant wildlife species that occupy or use the project site:
Common songbirds
White-tailed Deer
Squirrels other small mammals

n. Does the project site contain a designated significant natural community? ☐ Yes ☑ No
If Yes:
i. Describe the habitat/community (composition, function, and basis for designation): _____
ii. Source(s) of description or evaluation: _____
iii. Extent of community/habitat:
- Currently: _____ acres
- Following completion of project as proposed: _____ acres
- Gain or loss (indicate + or -): _____ acres

o. Does project site contain any species of plant or animal that is listed by the federal government or NYS as endangered or threatened, or does it contain any areas identified as habitat for an endangered or threatened species? ☑ Yes ☐ No

If Yes:
i. Species and listing (endangered or threatened):
Bald Eagle, Sedge Wren, Least Bittern, Pied-billed Grebe, Henslow's Sparrow, Short-eared Owl, Northern Harrier, Black Tern, Upland Sandpiper

p. Does the project site contain any species of plant or animal that is listed by NYS as rare, or as a species of special concern? ☐ Yes ☑ No

If Yes:
i. Species and listing:

q. Is the project site or adjoining area currently used for hunting, trapping, fishing or shell fishing? ☑ Yes ☐ No
If yes, give a brief description of how the proposed action may affect that use:
Hunting is prohibited on the STAMP site.

E.3. Designated Public Resources On or Near Project Site

a. Is the project site, or any portion of it, located in a designated agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304? ☑ Yes ☐ No
If Yes, provide county plus district name/number: GENE002, ORLEcn1

b. Are agricultural lands consisting of highly productive soils present? ☐ Yes ☑ No
i. If Yes: acreage(s) on project site? _____
ii. Source(s) of soil rating(s): _____

c. Does the project site contain all or part of, or is it substantially contiguous to, a registered National Natural Landmark? ☐ Yes ☑ No
If Yes:
i. Nature of the natural landmark: ☐ Biological Community ☐ Geological Feature
ii. Provide brief description of landmark, including values behind designation and approximate size/extent: _____

d. Is the project site located in or does it adjoin a state listed Critical Environmental Area? ☐ Yes ☑ No
If Yes:
i. CEA name: _____
ii. Basis for designation: _____
iii. Designating agency and date: _____

e. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places? ☐ Yes ☑ No

If Yes:

i. Nature of historic/archaeological resource: ☐ Archaeological Site ☐ Historic Building or District

ii. Name: _____

iii. Brief description of attributes on which listing is based:

_____

f. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory? ☑ Yes ☐ No

g. Have additional archaeological or historic site(s) or resources been identified on the project site? ☐ Yes ☑ No

If Yes:

i. Describe possible resource(s): See SEQR Update

ii. Basis for identification: _____

h. Is the project site within fives miles of any officially designated and publicly accessible federal, state, or local scenic or aesthetic resource? ☐ Yes ☑ No

If Yes:

i. Identify resource: _____

ii. Nature of, or basis for, designation (e.g., established highway overlook, state or local park, state historic trail or scenic byway, etc.): _____

iii. Distance between project and resource: _____ miles.

i. Is the project site located within a designated river corridor under the Wild, Scenic and Recreational Rivers Program 6 NYCRR 666? ☐ Yes ☑ No

If Yes:

i. Identify the name of the river and its designation: _____

ii. Is the activity consistent with development restrictions contained in 6NYCRR Part 666? ☐ Yes ☐ No

F. Additional Information

Attach any additional information which may be needed to clarify your project.

If you have identified any adverse impacts which could be associated with your proposal, please describe those impacts plus any measures which you propose to avoid or minimize them.

G. Verification

I certify that the information provided is true to the best of my knowledge.

Applicant/Sponsor Name Mark A Masse Date 06/13/2019

Signature _____ Title Senior Vice President of Operations

PRINT FORM

EAF Mapper Summary Report

Thursday, June 04, 2020 8:51 AM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.



B.i.i [Coastal or Waterfront Area]	No
B.i.ii [Local Waterfront Revitalization Area]	No
C.2.b. [Special Planning District]	Yes - Digital mapping data are not available for all Special Planning Districts. Refer to EAF Workbook.
C.2.b. [Special Planning District - Name]	NYS Heritage Areas:West Erie Canal Corridor, Federal Recreation Land:Iroquois National Wildlife Refuge
E.1.h [DEC Spills or Remediation Site - Potential Contamination History]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Listed]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Environmental Site Remediation Database]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.iii [Within 2,000' of DEC Remediation Site]	No
E.2.g [Unique Geologic Features]	No
E.2.h.i [Surface Water Features]	Yes
E.2.h.ii [Surface Water Features]	Yes
E.2.h.iii [Surface Water Features]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
E.2.h.iv [Surface Water Features - Stream Name]	837-78, 847-687, 837-76, 847-658, 847-683
E.2.h.iv [Surface Water Features - Stream Classification]	C
E.2.h.iv [Surface Water Features - Wetlands Name]	Federal Waters, NYS Wetland
E.2.h.iv [Surface Water Features - Wetlands Size]	NYS Wetland (in acres):404.7, NYS Wetland (in acres):1362.3

E.2.h.iv [Surface Water Features - DEC Wetlands Number]	AK-3, A-5
E.2.h.v [Impaired Water Bodies]	No
E.2.i. [Floodway]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.2.j. [100 Year Floodplain]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.2.k. [500 Year Floodplain]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.2.l. [Aquifers]	No
E.2.n. [Natural Communities]	No
E.2.o. [Endangered or Threatened Species]	Yes
E.2.o. [Endangered or Threatened Species - Name]	Bald Eagle, Sedge Wren, Least Bittern, Pied-billed Grebe, Henslow's Sparrow, Short-eared Owl, Northern Harrier, Black Tern, Upland Sandpiper
E.2.p. [Rare Plants or Animals]	No
E.3.a. [Agricultural District]	Yes
E.3.a. [Agricultural District]	GENE002, ORLEcn1
E.3.c. [National Natural Landmark]	No
E.3.d [Critical Environmental Area]	No
E.3.e. [National or State Register of Historic Places or State Eligible Sites]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.3.f. [Archeological Sites]	Yes
E.3.i. [Designated River Corridor]	No

STAMP WWTF, FM, Substation, and Water Supply EAF Mapper Summary



The Project Modifications include all actions necessary to undertake the following:

- Construction of a wastewater treatment facility ("WWTF") on the STAMP Site within the utility infrastructure area to treat the sanitary wastewater generated by STAMP's manufacturing and other tenants. The WWTF will not treat the manufacturing tenants' process wastewater, rather the tenants will treat their own process wastewaters directly before discharging to the main pump station wet well. The main pump station will then pump the combined flows through a proposed force main ("Force Main") to a new discharge point to be located on Oak Orchard Creek in the Town of Shelby, Orleans County, New York.

- Construction of the Force Main which involves the installation of approximately 44,750 linear feet of sanitary force main, metering vaults, and maintenance manholes. The vast majority of installation of sewer related infrastructure will be along public roads via a combination of open cut method and directional drill methods. The Force Main will convey up to six (6) million gallons per day ("MGD") of treated wastewater from the STAMP Site to a new discharge in Oak Orchard Creek.

- A new water main ("Water Main") of approximately 23,000 linear feet to be installed along the Lewiston Road right of way between the Genesee County line with Niagara County and the STAMP Site. The new water main will bring up to six (6) MGD of water from the Niagara County Water District ("NCWD") to the STAMP Site.

- The development of an approximate 20 acre parcel located immediately north of STAMP. This landlocked parcel lies between the STAMP Site and a utility corridor which houses the Empire Pipeline and a 345 KV Power Line which will ultimately supply power to STAMP tenants. This parcel is located to the west of the intersection of Lewiston Road (NYS Route 77) and Crosby Road in the Town of Alabama and is bounded by the Empire Pipeline/345 KV Power Line utility corridor to the north, hedgerows to the east and south, and woods and brush to the west. It is anticipated that this parcel will be the site of an electrical substation.

Genesee County Economic Development Center
WNY STAMP - Off Site Sewer
Permanent Easements

	Property Owner Name		
Road	Last	First	Tax Account #
Lewiston Road	Chiro	Tammy	6.-1-46.2
Allegany Road	Andrews	Jay	6.-1-38
Allegany Road	Johnson	Richard	6.-1-37.1
Allegany Road	John Mangunus Living Trust		6.-1-47.11
Allegany Road	Weaver	Brian	6.-1-26.1
South Gravel Road	Strickland	James H.	112.-1-29.111
South Gravel Road	Fuller Sales & Leasing		101.-1-29.1
South Gravel Road	Grimes	Gorden D.	101.-1-25
South Gravel Road	Zelazny	Walter	101.-1-16.1
South Gravel Road	Zelazny	Walter	101.-1-14
South Gravel Road	Hassan Family Trust		90.20-1-1.22
South Gravel Road	Islamic Center of Medina		90.20-1-1.21
South Gravel Road	Young	Josef A.	90.16-2-6
South Gravel Road	Walters	Lawrence M. Sr.	90.16-1-47
South Gravel Road	Smith	Garra H.	90.-1-35.11
South Gravel Road	Smith	Garra H.	90.-1-35.11
South Gravel Road	Smith	Garra H.	90.-1-35.12

STAMP
6 MGD Water Transmission Main
MASTER LIST
Last Updated **6/3/2020**

Tonawanda Wildlife Management Area

Easement #	Tax Map #	Owner	Property Address	Mailing Address	Permanent or Temporary	Comments
1	1.-1-9	NYS DEC	Lewiston Road		Permanent	
2	1.-1-8	NYS DEC	Lewiston Road		Permanent	
3	1.-1-7	NYS DEC	Lewiston Road		Permanent	
4	5.-1-4	NYS DEC	Lewiston Road		Permanent	
5	6.-1-76	NYS DEC	Lewiston Road		Permanent	
6	6.-1-77	NYS DEC	Lewiston Road		Permanent	intermittent properties/parcels
7	6.-1-77	NYS DEC	Lewiston Road		Permanent	intermittent properties/parcels
8	6.-1-77	NYS DEC	Lewiston Road		Permanent	intermittent properties/parcels
9	6.-1-77	NYS DEC	Lewiston Road		Permanent	intermittent properties/parcels

Town of Alabama

Easement #	Tax Map #	Owner	Property Address	Mailing Address	Permanent or Temporary	Comments
1	6.-1-6	Laverne Smith	748 Lewiston Road	748 Lewiston Road Basom, NY 14013	Permanent	
2	6.-1-7	Kenneth Wagner	750 Lewiston Road	750 Lewiston Road Basom, NY 14013	Permanent	
3	6.-1-10	Matthew Moden	802 Lewiston Road	802 Lewiston Road Basom, NY 14013	Permanent	
4	6.-1-12	Robert Peters	818 Lewiston Road	818 Lewiston Road Basom, NY 14013	Permanent	
5	6.-1-74	Louise Cieszynski	916 Lewiston Road	916 Lewiston Road Basom, NY 14013	Permanent	
6	6.-1-73	Larry Horine	980 Lewiston Road	980 Lewiston Road Basom, NY 14013	Permanent	
7	6.-1-72.21	Clayton Fry	994 Lewiston Road	994 Lewiston Road Basom, NY 14013	Permanent	
8	6.-1-72.111	Del Mar Farms Inc	Lewiston Road	2684 Pratt Road Batavia, NY 14020	Permanent	intermittent property/parcel
9	6.-1.81	Jarrod Cramer	1018 Lewiston Road	1018 Lewiston Road Basom, NY 14013	Permanent	
10	6.-1-72.111	Del Mar Farms Inc	Lewiston Road	2684 Pratt Road Batavia, NY 14020	Permanent	intermittent property/parcel
11	6.-1-80	Carl Shetler	1050 Lewiston Road	1050 Lewiston Road Alabama, NY 14013	Permanent	
12	6.-1-72.112	Carl Shetler	1062 Lewiston Road	1062 Lewiston Road Alabama, NY 14013	Permanent	
13	6.-1-60.1	Joyce Anderson	1096 Lewiston Road	1096. Lewiston Road Alabama, NY 14013	Permanent	
14	6.-1-60.2	Victoria Pelton	1118 Lewiston Road	1118 Lewiston Road Basom, NY 14013	Permanent	
15	6.-1-60.1	Joyce Anderson	1096 Lewiston Road	1096. Lewiston Road Alabama, NY 14013	Permanent	intermittent property/parcel
16	6.-1-56	Thomas Carlo	1130 Lewiston Road	1130 Lewiston Road Basom, NY 14013	Permanent	
17	6.-1-55	Casey McKenzie	1138 Lewiston Road	1138 Lewiston Road Alabama, NY 14013	Permanent	

STAMP Infrastructure Project Modifications
List of Potentially Interested and Involved Agencies

The following is a list of potentially interested and involved agencies:

The Town of Alabama Town Board
2218 Judge Road
Oakfield, NY 14125
Attn: Rob Crossen, Town Supervisor

The Town of Alabama Planning Board
2218 Judge Road
Oakfield, NY 14125
Attn: Ronald Gilbert, Planning Board Chairman

Town of Alabama Superintendent of Highways
2218 Judge Road
Oakfield, NY 14125
Attn: Jeffrey Covel

The Town of Alabama Fire Department
P.O. Box 798
Basom, NY 14013
Attn: Gary Patnode, Chief

The Town of Shelby Town Board
Shelby Town Hall
4062 Salt Works Road
Medina, NY 14103
Attn: Jeff Smith, Supervisor

Town of Shelby Superintendent of Highways
Shelby Town Hall
4062 Salt Works Road
Medina, NY 14103
Attn: Dale Root

The Genesee County Department of Planning
County Building 2
3837 West Main Street Road
Batavia, NY 14020
Attn: Felipe Oltramari, Director

The Genesee County Health Department
County Building 2
3837 West Main Street Road
Batavia, NY 14020
Attn: Paul Pettit, Public Health Director

The Genesee County Legislature
Old Courthouse
7 Main Street
Batavia, NY 14020
Attn: Shelley Stein, Chairman

The Genesee County Highway Superintendent
29 Liberty Street, Suite #3
Batavia, NY 14020
Attn: Tim Hens

Genesee County Emergency Management
7690 State Street Road
Batavia, NY 14020
Attn: Bill Schutt, Deputy Coordinator

The Genesee County Water Resources Board
29 Liberty Street, Suite #3
Batavia, NY 14020
Attn: Earl LaGrou, Chair

The County of Orleans
3 South Main Street
Albion, NY 14411-1495
Attn: John C. Welch, Jr., Chief Administrative Officer

Orleans County Department of Health
14016 State Route 31, Suite 101
Albion, NY 14411
Attn: Paul A. Pettit, Director

Orleans County Emergency Management
14064 W County House Rd,
Albion, NY 14411
Attn: Dale Banker, Director

The Niagara County Water District
5450 Ernest Road., PO Box 315
Lockport, NY 14095-0315
Attn: Jennifer Bieber, Administrative Director

The New York State Department of Transportation
5441 East Main Street Road
Batavia, NY 14020
Attn: Dan Stahley, Asst. Resident Engineer

The New York State Department of Environmental Conservation
Region 8 Office
6274 E. Avon-Lima Road
Avon, NY 14414-9519
Attn: Kimberly Merchant, Regional Permit Administrator

The New York State Department of Health
Corning Tower
Empire State Plaza
Albany, NY 12237

The New York State Office of Parks, Recreation and Historic Preservation
P.O. Box 189
Waterford, NY 12188-0189
Attn: Nancy Herter, Archeology Unit Program Coordinator

The New York State Department of Agriculture and Markets
10B Airline Drive
Albany, NY 12235
Attn: Bob Sommers, Manager Farmland Protection Unit

New York State Power Authority
123 Main Street
Corporate Communications
Mail Stop 10 B
White Plains, NY 10601-3170
Attn: Gil C. Quiniones, President and CEO

The New York State Thruway Authority
Administrative Headquarters
200 Southern Blvd.
Albany, NY 12209
Attn: Elizabeth Novak, Director of Transportation Planning and Environmental Services

Empire State Development Corporation
633 Third Avenue
New York, NY 10017
Attn: Soo Kang, Planning and Environmental Review

New York State Public Service Commission
Empire State Plaza
Agency Building 3
Albany, NY 12223-1350
Attn: Hon. Michelle L. Phillips, Secretary to the Commission

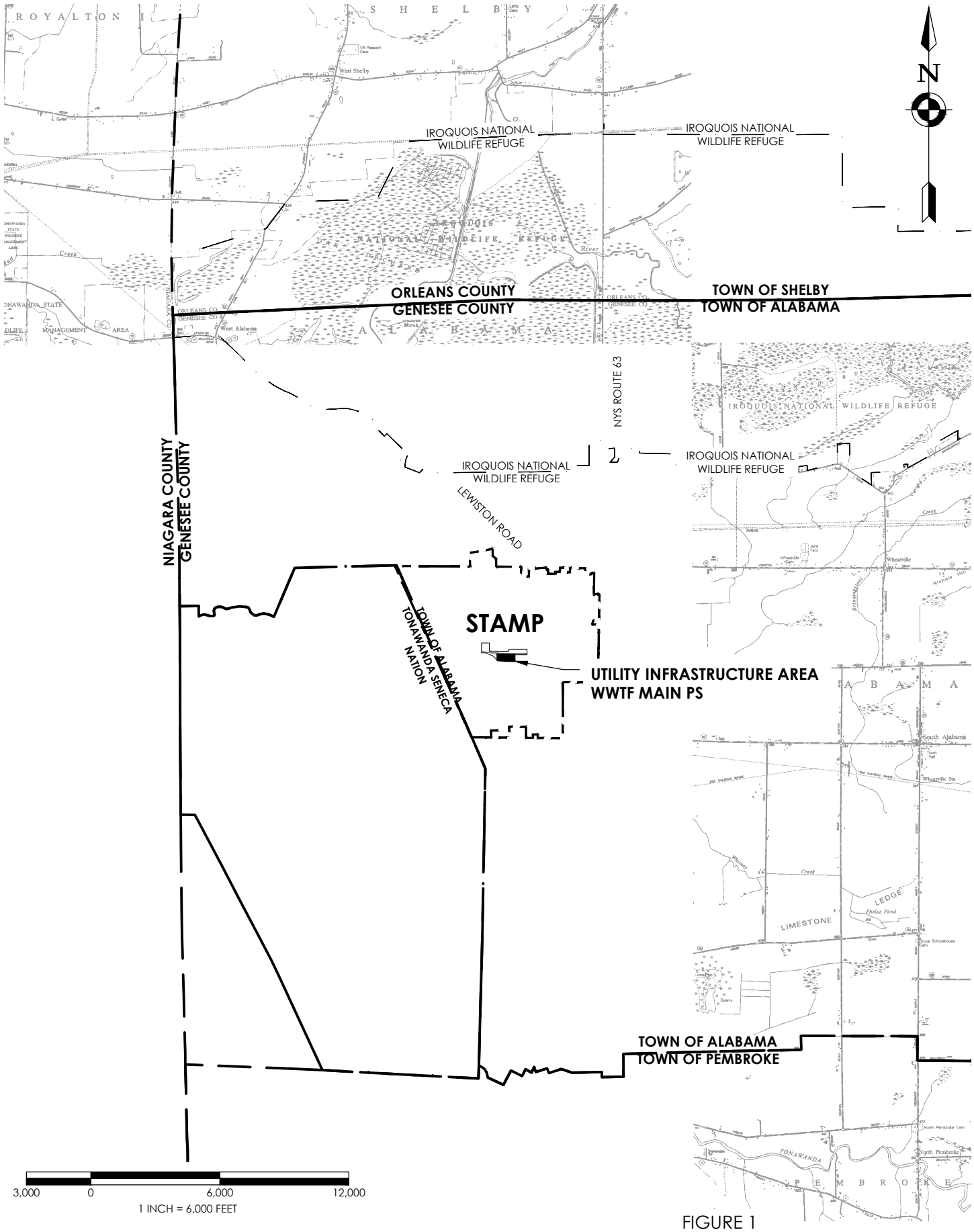


FIGURE 1

205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
CPLteam.com
ARCHITECTURE ▪ ENGINEERING ▪ PLANNING

DATE:	4/27/20
DRAWN:	ZLA
CHECKED:	ARK
SCALE:	AS NOTED
PROJ. #:	14822.00

STAMP SITE GENERAL LOCATION MAP

WNY STAMP OFFSITE SEWER

TOWN OF ALABAMA AND TOWN OF SHELBY, NEW YORK STATE

Referenced Drawings: None
Drawing Name: J:\PROJECTS\GCEDC\STAMP Offsite Sewer\D Design\ACAD\Civil\Figures\Location Map May 2020.dwg
Date last accessed: 5/18/2020 3:33 PM
Date last plotted: 5/21/2020 8:12 AM
Plotted By: Nick Bayer

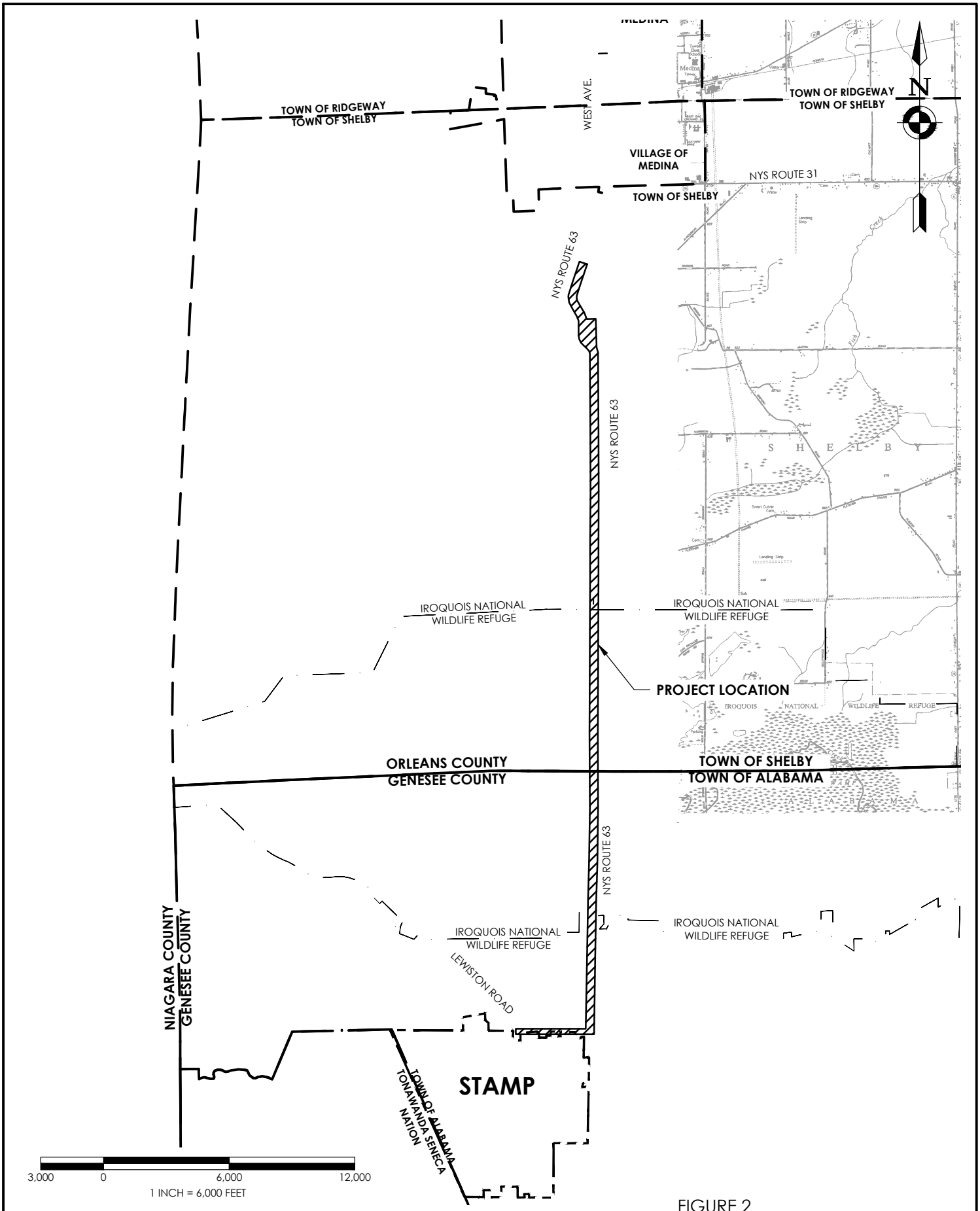


FIGURE 2

205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
CPLteam.com
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DATE:	4/27/20
DRAWN:	ZLA
CHECKED:	ARK
SCALE:	AS NOTED
PROJ. #:	14822.00

FORCE MAIN GENERAL LOCATION MAP

WNY STAMP OFFSITE SEWER

TOWN OF ALABAMA AND TOWN OF SHELBY, NEW YORK STATE

Referenced Drawings: None
Drawing Name: J:\PROJECTS\GCEDC\STAMP Offsite Sewer\D Design\ACAD\Civil\Figures\Location Map May 2020.dwg
Date last accessed: 5/18/2020 3:31 PM
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Plotted By: Zach Anderson

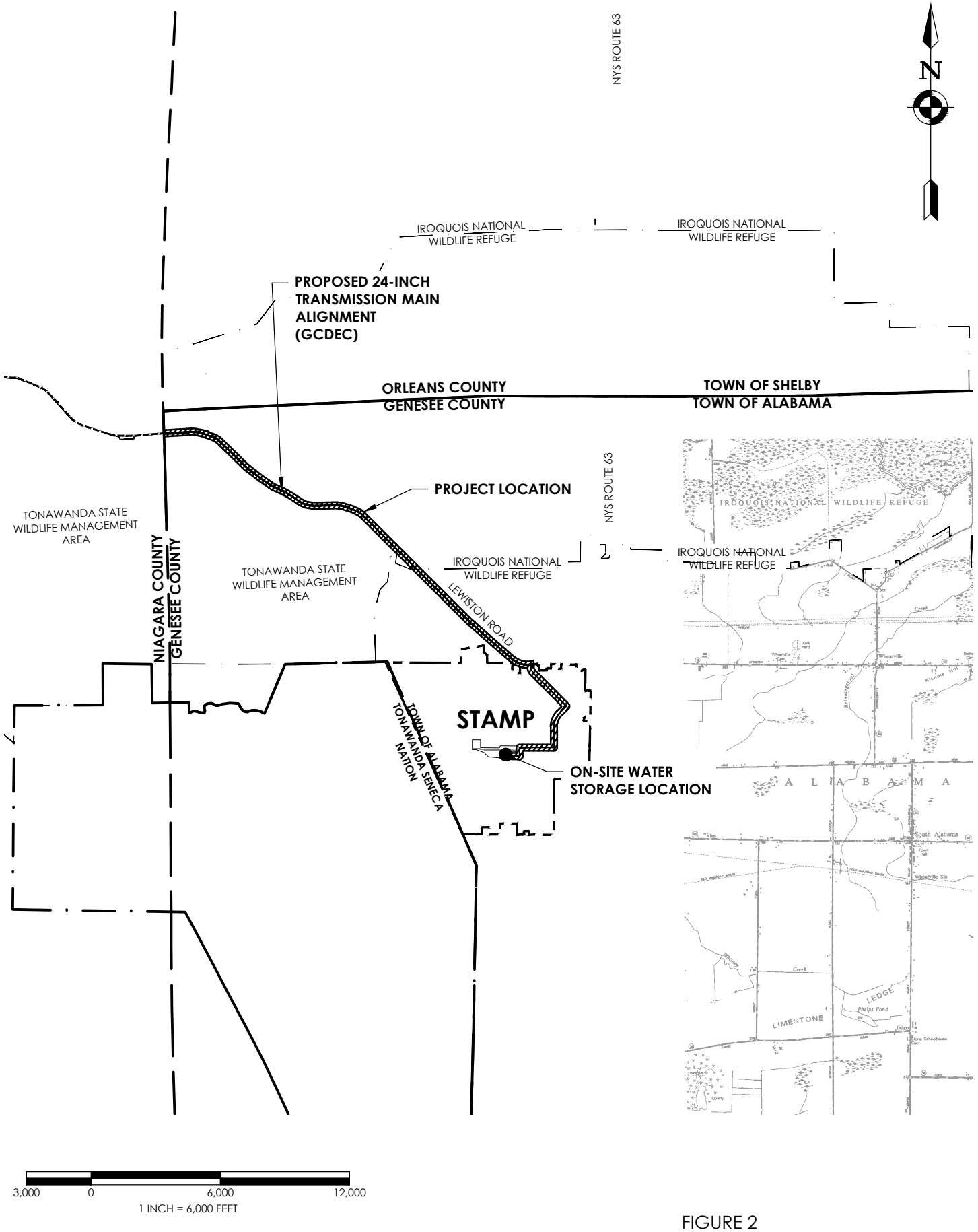


FIGURE 2

205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
CPLteam.com
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DATE:	5/22/20
DRAWN:	RRT
CHECKED:	JF
SCALE:	AS NOTED
PROJ. #:	14822.00

WATER TRANSMISSION MAIN GENERAL LOCATION MAP

WNY STAMP 6 MGD WATER

TOWN OF ALABAMA, NEW YORK STATE

Referenced Drawings: None
Drawing Name: \\clarkpatterson.local\dfs\Projects2\PROJECTS\GCEDC\STAMP 6 MGD\D Design\ACAD\Civil\Figures\Location Map May 2020.dwg
Date last accessed: 5/22/2020 11:25 AM
Date last plotted: 5/22/2020 11:34 AM
Plotted By: Nick Bayer

STAMP Infrastructure Project Modifications
List of Potentially Interested and Involved Agencies

The following is a list of potentially interested and involved agencies:

The Town of Alabama Town Board
2218 Judge Road
Oakfield, NY 14125
Attn: Rob Crossen, Town Supervisor

The Town of Alabama Planning Board
2218 Judge Road
Oakfield, NY 14125
Attn: Ronald Gilbert, Planning Board Chairman

Town of Alabama Superintendent of Highways
2218 Judge Road
Oakfield, NY 14125
Attn: Jeffrey Covel

The Town of Alabama Fire Department
P.O. Box 798
Basom, NY 14013
Attn: Gary Patnode, Chief

The Town of Shelby Town Board
Shelby Town Hall
4062 Salt Works Road
Medina, NY 14103
Attn: Jeff Smith, Supervisor

Town of Shelby Superintendent of Highways
Shelby Town Hall
4062 Salt Works Road
Medina, NY 14103
Attn: Dale Root

The Genesee County Department of Planning
County Building 2
3837 West Main Street Road
Batavia, NY 14020
Attn: Felipe Oltramari, Director

The Genesee County Health Department
County Building 2
3837 West Main Street Road
Batavia, NY 14020
Attn: Paul Pettit, Public Health Director

The Genesee County Legislature
Old Courthouse
7 Main Street
Batavia, NY 14020
Attn: Shelley Stein, Chairman

The Genesee County Highway Superintendent
29 Liberty Street, Suite #3
Batavia, NY 14020
Attn: Tim Hens

Genesee County Emergency Management
7690 State Street Road
Batavia, NY 14020
Attn: Bill Schutt, Deputy Coordinator

The Genesee County Water Resources Board
29 Liberty Street, Suite #3
Batavia, NY 14020
Attn: Earl LaGrou, Chair

The County of Orleans
3 South Main Street
Albion, NY 14411-1495
Attn: John C. Welch, Jr., Chief Administrative Officer

Orleans County Department of Health
14016 State Route 31, Suite 101
Albion, NY 14411
Attn: Paul A. Pettit, Director

Orleans County Emergency Management
14064 W County House Rd,
Albion, NY 14411
Attn: Dale Banker, Director

The Niagara County Water District
5450 Ernest Road., PO Box 315
Lockport, NY 14095-0315
Attn: Jennifer Bieber, Administrative Director

The New York State Department of Transportation
5441 East Main Street Road
Batavia, NY 14020
Attn: Dan Stahley, Asst. Resident Engineer

The New York State Department of Environmental Conservation
Region 8 Office
6274 E. Avon-Lima Road
Avon, NY 14414-9519
Attn: Kimberly Merchant, Regional Permit Administrator

The New York State Department of Health
Corning Tower
Empire State Plaza
Albany, NY 12237

The New York State Office of Parks, Recreation and Historic Preservation
P.O. Box 189
Waterford, NY 12188-0189
Attn: Nancy Herter, Archeology Unit Program Coordinator

The New York State Department of Agriculture and Markets
10B Airline Drive
Albany, NY 12235
Attn: Bob Sommers, Manager Farmland Protection Unit

New York State Power Authority
123 Main Street
Corporate Communications
Mail Stop 10 B
White Plains, NY 10601-3170
Attn: Gil C. Quiniones, President and CEO

The New York State Thruway Authority
Administrative Headquarters
200 Southern Blvd.
Albany, NY 12209
Attn: Elizabeth Novak, Director of Transportation Planning and Environmental Services

Empire State Development Corporation
633 Third Avenue
New York, NY 10017
Attn: Soo Kang, Planning and Environmental Review

New York State Public Service Commission
Empire State Plaza
Agency Building 3
Albany, NY 12223-1350
Attn: Hon. Michelle L. Phillips, Secretary to the Commission

STAMP Force Main, Main Pump Station, & Onsite Wastewater Treatment Facility

Basis of Design Report

For The

Genesee County Economic Development Center



June 2020

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I. General

A. Background

The Genesee County Industrial Development Agency d/b/a/ the Genesee County Economic Development Center (GCEDC) and its affiliate, the Genesee Gateway Local Development Corporation (GGLDC), have been working for the last several years on the development of the Western New York Science & Technology Advanced Manufacturing Park (STAMP). The Site is planned as an advanced manufacturing campus on approximately 1,262 acres of land in the Town of Alabama, New York located along the west side of New York State Highway 77/63 (north of Judge Road) approximately five miles north of the I-90/New York State Thruway (STAMP Site).

At full build out, STAMP will be a high technology campus with the potential to accommodate over 6 million square feet of advanced technology manufacturing and related uses and to create up to 10,000 jobs. The GCEDC, as lead agency pursuant to the State Environmental Quality Review Act (SEQR), prepared a Generic Environmental Impact Statement (GEIS) and a Smart Growth Impact Statement ("SGIS") that analyzed the potential impacts of STAMP pursuant to the requirements of the SEQR and the State Smart Growth Public Information Policy Act.

In January 2012, the Final GEIS for STAMP was accepted as complete. The FGEIS identified alternatives for wastewater treatment for STAMP and assumed a maximum of 3 million gallons per day (MGD) of sanitary discharge would be needed. The preferred treatment alternative at that time included an onsite Wastewater Treatment Facility (WWTF) with a discharge to either Oak Orchard Creek, Whitney Creek or Tonawanda Creek. Based on feedback received during the GEIS process, several meetings with the neighboring Tonawanda Seneca Nation, and changes in the development of the STAMP Site to focus on the semiconductor industry, new alternatives for treatment were developed.

In August of 2013, a Conceptual Water and Wastewater Alternatives Analysis and Recommendations Report identified potential sanitary sewage conveyance and treatment options for the STAMP project, including 1.0 million gallons per day (MGD) of sanitary sewer effluent and 11.0 MGD of industrial process wastewater. Based on this report, the Village of Medina Wastewater Treatment Facility (Medina WWTF) was selected as the preferred sanitary sewer effluent treatment alternative.

The Tonawanda Seneca Nation voiced concerns with discharging effluent to Whitney Creek which flows into the Tonawanda Creek. The Tonawanda Creek flows through the Tonawanda Seneca Nation and it is an essential part of their cultural heritage. Another concern expressed by the New York State Department of Environmental Conservation (NYSDEC) was discharges to Whitney Creek and how that could affect the hydrology of the Tonawanda Wildlife Management Area. By utilizing the Medina WWTF and connecting to an established collection system, potential effects associated with discharging to Whitney Creek or directly to the Tonawanda Creek could be avoided.

A Memorandum of Understanding (MOU) was developed between the Village of Medina and the GCEDC which outlined the process of analyzing potential discharge routes through the Village, analyzing potential capacity upgrades at the Medina WWTF, and overall project implementation and ownership. However, in May 2017, the MOU with the Village expired so other means of wastewater disposal was deemed necessary. Additionally, by utilizing onsite recycling for the industrial process water, the overall potential total volume of wastewater has decreased significantly from 12 MGD to 6 MGD, causing a change in the proposed treatment methods and discharge location. More importantly, as noted in the 2013 Conceptual Water and Wastewater Alternatives Analysis and Recommendations Report, the need for a potential future large diameter force main "big sewer" for the disposal of process water is no longer needed.

With a reduced wastewater discharge maximum requirement of 6.0 MGD, onsite alternatives were once again considered feasible. Offsite effluent discharge locations were reviewed and analyzed as part of an ongoing effort to minimize environmental impacts and overall project costs for the overall wastewater solution. The review included input from the NYSDEC. Oak Orchard Creek near NYS Route 63, just north of the Iroquois Wildlife Refuge, was determined to be the preferred discharge location.

Several layout options were considered for an onsite WWTF, onsite pump station, and offsite discharge location. The preferred alternative involves an onsite Sequential Batch Reactor (SBR) sanitary sewer treatment facility that will discharge effluent to an onsite wastewater pump station. The WWTF will be designed to be easily expandable at treatment capacity levels of 0.25, 0.50, and 1.00 MGD. The onsite wastewater pump station involves a pump station and force main sewer that will collect and discharge pretreated manufacturing process wastewater effluent and treated effluent from the onsite WWTF. The pump station will be designed to be easily expandable at capacity levels of 3.0 MGD and 6.0 MGD. The STAMP team is currently working through the permit process with the U.S. Fish and Wildlife Service (USFWS) for the offsite force main and has begun design and permitting efforts for the onsite WWTF.

B. Purpose

A new onsite wastewater treatment facility (WWTF) will be constructed to treat the sanitary wastewater generated by the manufacturing tenants. The process wastewater generated by the tenants will be treated at the tenants' facilities. After treatment, the effluent flow from the onsite WWTF and the treated process wastewaters will be combined at the main pump station (MPS) wet well and then pumped to the discharge location in Oak Orchard Creek, north of Shelby Center in Orleans County through a force main (FM).

This report will outline the design of the FM, MPS, and the onsite WWTF, as well as describe the basis of design for the equipment and treatment processes. All work was designed within the accepted criteria of the Recommended Standards for Wastewater Facilities, 2004 Edition (commonly referred to as the "10 States Standards") and TR-16 Guides for the Design of Wastewater Treatment Works (referred to as "TR-16).

Force Main and Main Pump Station

II. Project Information

A. Site Location

The existing STAMP Site consists of agricultural land located within the Town of Alabama (Town). The location of the proposed STAMP Site including the location of the onsite MPS is shown in Figure 1, and the route of the new FM is shown in Figure 2.

B. Design Flows

The wastewater produced at the STAMP Site will increase incrementally as the STAMP Site is developed. Therefore, the MPS and wet well will be built in phases in response to these increasing flows up to the anticipated full-build flow rate of 6.0 MGD. The FM will be constructed to convey up to 6.0 MGD.

C. Effluent Discharge Location

Based on estimated construction costs, existing water quality, and input from the NYS DEC and all stakeholders, Oak Orchard Creek was determined to be the preferred body of water for discharge. The proposed discharge location is on the north side of the Hamlet of Shelby Center, along South Gravel Road (NYS Route 63). A map showing the selected route and discharge location is shown in Figure 2.

III. Proposed Project

The 2014 edition of the Recommended Standards for Wastewater Facilities, or Ten States Standards (10SS) and the 2011 Edition of the Guides for the Design of Wastewater Treatment Works, or TR-16, were used as references and guidance for the design of the proposed pump stations and force main.

A. Main Pump Station (MPS)

The treated onsite WWTF effluent and the tenant's treated process wastewater will be directed to the wet well of the MPS. The combined flow will be pumped to the outfall location through the FM. The proposed MPS will be constructed on the designated utility parcel located on the western side of Crosby Road, just south of the Main Access Road within the STAMP Site. The wet well and MPS building will be constructed to the east of the onsite WWTF. Figure 3 shows the utility parcel located on the overall STAMP site plan and Figure 4 shows the site plan of the WWTF and MPS within the utility parcel.

The MPS will utilize a rectangular concrete structure sized in accordance with Ten States Standards to handle flows from both the WWTF and the treated process water produced from the tenants at the STAMP Site. The full build-out wet well will have a storage volume of approximately 50,000 gallons. The storage will be provided by a 41'x15' tank, which will be separated by a divider wall in order to isolate flow to specific pumps. The operating range of the wet well will be approximately 10 feet vertically. Just outside of the wet well on the downstream side will be a precast concrete vault to house check valves and isolation valves for each pump.

Each section within the wet well will include two submersible pumps, with a total of 4 pumps. At full build out of the site and pump station, 3 submersible pumps will be in operation capable of pumping 6.0 MGD, with the 4th pump acting as a backup. Pumps will cycle in order to ensure equal wear on the pumps for maintenance purposes. The initial stage will include installation of 2 pumps with the ability to pump approximately 4.0 MGD, and new pumps will be added as flows onsite increase until full build out is reached.

The wet wells will include ventilation for both intake and exhaust of air using explosion proof equipment. In addition, a vault will be constructed to house a magnetic flow meter to measure flow pumped from the pump station. The ventilation of the full build-out wet well and dry well is designed to meet the requirements as outlined in Ten States Standards.

The controls for the submersible pumps will be housed in a metal sided enclosure. This enclosure will also house the utilities to the pump station including potable water and electric services.

B. Force Main

1. Location

The proposed force main is located between the MPS and the proposed discharge location. The route is along portions of Crosby Road and a proposed access roadway on the STAMP Site, north along Allegany Road (NYS Route 63) in the Town of Alabama, South Gravel Road in the Town of Shelby to the discharge point along Oak Orchard Creek. The discharge point is just north of the Hamlet of Shelby Center in Orleans County. The installation involves approximately 45,000 linear feet consisting of a combination of 24-inch DR-14 PVC, 20-inch diameter DR-11 HDPE, and 18-inch diameter DR-18 PVC sanitary force main, metering vaults, and maintenance manholes. The force main route is shown on Figure 2.

2. Design

The force main design considered effluent velocity, total dynamic head (TDH), and maximum rated working pressures for multiple diameters of PVC and HDPE sanitary force main. The system curve for the FM can be found in Appendix A at the end of this report.

A combination of pipe sizes and pressure ratings was selected to best accommodate the wide range of flow conditions and reduce pipe friction losses at the future higher flow. The force main was broken up into three conceptual sections, South of the Wildlife Refuge, inside the Wildlife Refuge, and north of the Wildlife Refuge. Given the anticipated soil conditions (moist peat and organics) and to reduce impacts, the force main within the Refuge will be installed by horizontal directional drilling (HDD) methods using fused high-density polyethylene pipe (HDPE). The wall thickness of HDPE pipe for the expected pressures is significantly greater than PVC pipe.

Pressures in the force main are expected to be highest within the southern section; in this area a 24” DR-14 PVC pipe was selected in order to ensure that the pipe could handle the higher expected head from the pump station. Inside of the refuge, the pipe size will be reduced to a 20” HDPE in order to accommodate the directional drilling methods required. On the north side of the refuge, the pipe will be further reduced since the anticipated pressure is lower. Outside of the refuge to the north, directional drilling methods will not be required, and therefore 18” DR-18 PVC pipe will be used.

To prevent settling of solids, the minimum flow required to maintain 2 ft/s in the 24” DR-14 PVC main (21.89” ID) is 2,346 gallons per minute (GPM). For the initial phases of the STAMP site, the temporary pump station will be operated to provide a flushing velocity through the main for an extended period of time. The temporary wet well has a volume of 0.50 MGD, this provides 3.6 hours of 2,346 gpm flow which will flush the entire length of FM to the outfall. It should also be noted that the proposed flow through the force main will be treated effluent and is not expected to have significant levels of solids or grit to settle in the pipe.

3. Profile

Overall, the force main route from the MPS to the discharge location is generally downhill with multiple high points along the route. The force main exits the MPS at 661.00' and the discharge structure invert in Oak Orchard Creek is approximately 616.00'. Therefore, the discharge elevation of the force main is approximately 45 vertical feet lower than the discharge elevation of pumps in the MPS.

The overall downhill alignment requires consideration of the effects of siphoning and gravity flow, especially for northern most section of the force main. An actuated control valve will be installed on the force main near the discharge point to prevent the force main from draining by gravity and to ensure the pipe remains full.

The PVC force main will be installed at a constant minimum slope of 0.5%, within the open cut areas and where the force main will be installed by HDD method, the HDPE pipe will be drilled at a minimum of 1.0% slope. The force main pipe is purposely installed sloping up and down along the route to provide designated high points for releasing air within the pipe. Air release valves will be installed within maintenance manholes at these high points.

4. Maintenance Manholes

Maintenance manholes will be installed at each high point along the route of the force main between the STAMP Site and the discharge location. Each manhole is a 6'-0" diameter precast concrete structure that contains an internal access ladder, a removable section of pipe, air release/vacuum breaker valve, and vent piping. Air-release/vacuum breaker valves are required to prevent air from becoming captured inside the force main pipe, which causes flow constrictions and results in poor pumping efficiencies. The removable fitting provides a means to access the force main for flushing, testing and bypass pumping purposes. The fitting consists of a 24" long straight section of ductile iron pipe that can easily be removed for the attachment of other fittings, testing equipment or bypass pumps. Each manhole will also have a 24" diameter cast iron manhole cover placed on top for access to the internal components. The cover will be installed so it is level with the finish grade will be placed over top of the pipe for access.

Since some of these maintenance manholes are in areas where the high-water level would be above the elevation of the air release/vacuum valve, the air release/vacuum breaker piping must extend above grade to ensure the air release valve vents the air properly. For these locations, a 2" diameter galvanized steel vent in the shape of a candy cane that extends approximately 2' above the high-water level will be required. The vent will contain a screen over the end of the pipe to prevent animals from entering the vent piping. The piping will be painted to blend in with the surroundings.

Main line valves will be installed approximately every 1,000 feet along the force main to provide a means to isolate sections of the force main for testing and maintenance purposes.

5. Sampling Metering

An 18" magnetic flow meter, located on the discharge piping within the new Main Pump Station building, will monitor the instantaneous and total flows exiting the STAMP Site. An automatic sample will collect a composite sample of the combined treated process wastewater and treated sanitary wastewater. Magnetic flow meters will also be installed at both the south and the north end of the Wildlife Refuge to monitor any unexpected loss within the Refuge limits.

6. Main Line Valves

The force main will require numerous main line valves along the route from the STAMP Site to the discharge location. Valves are located at each of the maintenance manholes and both of the metering manholes. The valves provide a means to isolate sections of the force main for testing and maintenance purposes. Each valve requires a cast iron valve box, installed to finish grade, for access to the valve's operating nut. The top of the valve box is approximately 8" in diameter and installed level with the finish grade.

7. Force Main Markers

Fiberglass pipeline markers will be placed at periodic intervals along the entire force main route. Each marker is approximately 4" wide and extends 5' above grade. The markers are used to help identify the location of the underground pipe, especially during the winter months and within heavily vegetated areas. A total of 14 markers will be installed within the Iroquois NWR area.

Onsite WWTF

IV. Project Information

A. Site Location

The existing STAMP Site consists of agricultural land located within the Town of Alabama (Town). The location of the proposed STAMP Site including the location of the onsite WWTF is shown in Figure 1.

B. Design Flows

The sanitary wastewater produced at the STAMP Site will increase incrementally as the STAMP Site is developed. Therefore, the WWTF will be built in phases in response to these increasing flows. The full-build WWTF described in this report will be able to treat the expected full-build flow including 100,000 gallons per day (GPD) of treatment capacity allocated to the Town for future use. Therefore, the design average daily flow rate will be 1.0 MGD. The design flow rate is described in the table below.

DESIGN FLOW RATE

Average Daily Flow	1.0 MGD

C. Design Loadings

The sanitary wastewater produced at the STAMP Site is anticipated to have typical sanitary wastewater characteristics. The WWTF will be designed to treat the influent concentrations and loadings of contaminants. The table below summarizes these contaminants including 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), total Kjeldahl nitrogen (TKN), ammonia, and total phosphorus (TP). The loadings were determined from the design average daily flow of 1.0 MGD.

DESIGN INFLUENT CONTAMINANT CONCENTRATIONS AND LOADINGS

Contaminant	Concentration (mg/L)	Loading (lbs/d)
BOD_5	300	2502
TSS	250	2085
TKN (as N)	60	500
Ammonia (as N)	40	334
TP (as P)	4	33

D. Design Water Quality Treatment Limits

The New York State Department of Environmental Conservation (NYSDEC) has provided draft State Pollutant Discharge Elimination System (SPDES) permit limits based on water quality in Oak Orchard Creek near the proposed discharge location. The WWTF is designed to remove the influent contaminants to meet these discharge permit limits at the design flow rate. The table below summarizes some parameters from these limits. Complete draft SPDES permit limits are provided in Appendix B.

SELECTED SPDES DRAFT PERMIT LIMITS

Parameter	Limit
Flow Rate	1.0 MGD
pH	6.0 - 9.0 S.U.
BOD5	5.0 mg/L
TSS	10 mg/L
Ammonia (as N)	1.2 mg/L, Summer
	1.9 mg/L, Winter
TP (as P)	0.20 mg/L
Fecal Coliform	200 CFU/100mL

These limits include very low phosphorus discharge limits and fecal coliform removal requirements. Therefore, the WWTF will include a disc filter to remove phosphorus and a UV system to provide effluent disinfection.

V. Proposed Design

The WWTF will utilize a sequencing batch reactor (SBR) process, as well as disc filters, and a UV disinfection system to treat sanitary wastewater. This biological treatment process is suited to accept sanitary wastewater and biological waste streams such as from food processing plants. The facility will also include a screw press to dewater solids for final landfill disposal. The process design calculations and proposed equipment are provided in Appendix C. The site plan and process flow diagram can be found in Figures 4 and 5, respectively.

The STAMP sewer collection system will flow by gravity to convey wastewater from the STAMP tenants to the WWTF. The STAMP gravity sewer will enter the WWTF site approximately 15 ft below grade. Therefore, the wastewater will need to be lifted to grade to flow through the treatment process. The STAMP gravity sewer would be extended to connect to the influent wet well where submersible pumps will lift the wastewater to grade allowing flow by gravity to occur through the remaining system. After the influent wet well, wastewater will flow through a mechanical bar screen, which will remove large particles and debris. It will then flow to a distribution box which will evenly distribute the flows to the SBR basins.

The SBRs operate in sequences of batch treatment cycles beginning with aeration, then settling, and decanting. During the aeration cycle, oxygen is added for bacteria to consume the contaminants within the wastewater. The air is then turned off to allow the bacteria to settle to the bottom of the tank. This allows treated effluent to be decanted from the end of the SBR basins.

To remove phosphorus a coagulating agent such as aluminum sulfate will be added to the SBR to precipitate out phosphorus. This chemical will be stored in a chemical bulk storage area located in the headworks and control building. The chemical bulk storage areas will include spill prevention measures including double containment equal to the largest storage volume per NYSDEC bulk storage requirements.

The SBR effluent would then be filtered through a disc filter to remove the phosphorus to the required discharge levels. The clear effluent would then flow through a UV disinfection system before discharge to the MPS wet well on the STAMP site.

The biomass removed from the SBR basins will be pumped to the aerated sludge holding tanks (SHT). A dewatering building will be constructed to press the sludge to a higher solids concentration. This material can then be disposed of through solids hauling to a landfill.

The proposed designs are in accordance with the standards specified in 10 States Standards as well as *TR-16*.

A. Headworks

The headworks will include the influent wet well and the influent channel which will include the bar screen and Parshall flume meter to measure the influent flow rate. The flow will then proceed to the distribution structure which will distribute flows evenly to the SBRs. The headworks equipment will be installed within the headworks and control building which will also include the

chemical bulk storage facilities, see below, and the process equipment to operate the SBRs including the aeration blowers. The headworks and control building will also house the controls for the SBRs and will serve as the operations center of the facility.

Influent Wet Well

The influent pipe will connect to the 10-foot manhole wet wells which will house submersible pumps to lift the influent flows to the influent channel at grade. One manhole will be installed initially, and the pumps will be expandable in response to increasing wastewater flows as the STAMP Site is developed.

Bar Screen

A new bar screen will be installed within the concrete influent channel to remove large particles and debris. The bar screen is designed for flows of 2.0 MGD and includes 1/4" wide bars with 1/4" openings, set at a 30-degree angle as specified in Sections 61.121 and 61.122 of 10 State Standards. The bar screen is automatically cleaned by a rake conveyor operated by a ½ HP premium efficiency motor and variable frequency drive (VFD).

Washer Compactor

The screenings will be emptied into a washer compactor. The washer compactor is designed to accept debris up to 4", including clothes, metal, wood, concrete and other harsh materials. Operating on a ¾ HP premium efficiency motor, the compactor will reduce the volume of trash and solids by more than 80% and will be run on variable speed drives (VFDs) to limit electric usage and operate more efficiently. The washer compactor will compact the screenings and will provide water to wash the screening to reduce odors.

B. Distribution Structure

Following the headworks, wastewater will flow into a distribution structure which will include chambers that distribute the flows evenly to the SBR treatment tanks. The chambers will include slide gate valves to isolate the flows from the SBRs for maintenance.

C. Treatment Tanks

Sequential Batch Reactors

The facilities will be constructed with two SBR plants, each treating 0.5 MGD. One plant will consist of three rectangular concrete tanks. The SBRs will utilize the Intermittent Cycle Extended Aeration (ICEAS) process which is a continuous flow biological treatment method which combines multiple treatment processes into one tank. The process is automatic and combines the aeration system, blowers, pumps, mixers, effluent decanter and monitoring via one control system. The process does not require primary or secondary settlement tanks or return sludge pumping like traditional activated sludge facilities. Influent flow is distributed to all three SBR tanks where any flow or loading variations are evenly spread across the tanks.

The 30’ wide by 86’ long SBR tanks will have a side water depth of 15’. A 12” thick precast concrete pre-react wall, located 10’ from the influent end of the tanks will be constructed within each SBR tank to create a pre-react zone. Each pre-react wall will contain four (4) 18” square openings located at the bottom to allow flows to exit the pre-react zone to the treatment portion of the tank. PVC aeration piping containing fine bubble diffusers will be installed along the entire bottom of the tank. The fine bubble diffusers consist of 9” diameter EPDM discs. The tanks will be partially buried, utilizing catwalks along the top of the tank for access to the equipment and pumps in the tanks. A new steel staircase will be installed leading up to the catwalk. At the effluent end of the SBR tanks will be a stainless-steel decanter which consists of an adjustable weir to allow the upper portion of the settled wastewater to be removed while also keeping out any floatable materials. A butterfly valve located on the effluent piping will be installed to control effluent flow or isolate the SBR tanks for maintenance purposes.

The SBRs will be operated in batches. Wastewater will enter the pre-react zone where air will be continuously provided at a high rate to oxygenate the wastewater and provide for enhanced organics removal before proceeding to the treatment portion of the SBR tanks. During normal average daily flows, the SBRs will aerate for 2 hours where biological oxidation and reduction occurs. After this period, the air will be shut off to the SBR via an actuated valve, and the aeration and mixing process will cease for one hour which allows the solids to settle to the bottom of the tank. This occurs while influent wastewater continues to flow into each SBR. After an hour of settling time, the decanter weir is slowly lowered for treated wastewater to flow to the effluent piping.

After water has been drawn down to a specified level, based on capacity designs, the decanter rises, and the aeration and mixing process begins again. During periods of wet weather and high flows the control system automatically enters the storm mode where each decant cycle operates for 75% of the normal cycle time, and capacity will increase.

Sludge Holding Tanks

The SBR tanks will be further sectioned at the influent end of the tanks for the sludge holding tanks (SHTs) Settled sludge will be removed from the SBR tanks using submersible solids handling pumps and discharged into the SHTs. The pumps will be mounted to rails on the side of each SBR tank and will operate for a pre-determined time and frequency based on the accumulated sludge level. The SHTs will be aerated with fine bubble diffusers to prevent the sludge from becoming anaerobic and to provide for some aerobic digestion. Sludge will be allowed to settle and thicken with the supernatant being removed from the SHTs and returned to the head of the plant. This thickened and digested sludge will then be removed from the SHTs using submersible solids handling pumps and sent to the screw press for dewatering.

D. Aeration Blowers (SBRs)

Aeration for the SBRs will be provided by positive displacement blowers installed within the headworks and controls building. The blowers will utilize premium efficiency motors and VFDs to control the amount of air flow delivered to the SBRs under a wide range of flow conditions. Dissolved oxygen sensors located within each SBR and local control panels will monitor the dissolved oxygen content and be used to automatically adjust the amount of air delivered to each SBR using an actuated butterfly valve. Blowers will also be provided for the SHTs.

E. Filter Building

To achieve the required discharge limits of effluent phosphorus, disc filters will be installed following the SBRs. Phosphorus will be removed by adding alum to the SBR tanks. The phosphorus will precipitate and settle out of the wastewater and the disc filters will provide further removal of precipitated phosphorus and particles from the SBR decant. These disc filters will be installed within a concrete block building, as required by TR-16 Section 7.2.10.4. The filters will bring the total suspended solids levels below 10 mg/L.

Inside the filters, influent water enters between a pair of discs and water passes outward across the discs. The filtered water then flows by gravity into a common collection well and exits the unit through the outlet pipe. The filtering discs are constructed using a woven 316 stainless steel mesh as the filtration medium. As water passes across the rotating discs, solids accumulate on the disc surface, which creates head loss. This causes the water level between the pairs of discs to increase. When the water reaches a certain level, a level sensor activates an automatic spray wash cleaning sequence. The filter units will be expandable to allow for increasing numbers of discs to be installed in response to increasing wastewater flows as the tenants occupy the site.

Each disc has its own spray header to ensure efficient disc cleaning. The spray wash water (backwash reject) from each set of discs is collected in a common channel and then purged from the unit through a stainless-steel drain valve. The reject water will flow by gravity to a pump station which will pump the filter backwash back to the head of the plant.

F. Disinfection

Following the disc filters a UV disinfection system will be installed to inactivate any microorganisms still in the treated water to meet the effluent disinfection requirements. Upon exiting the disc filters, the effluent will flow through a meter, to measure the flow rate, and into the new ultraviolet disinfection structure. The structure will contain a concrete channel with a serpentine weir near the outlet of the structure. The weir is used to maintain a constant water level within the channel, guaranteeing that all UV bulbs are submerged at all times.

The main components of a UV disinfection system are the arc lamps, a reactor, and ballasts. The UV equipment will be installed within the channel. The system will include expandable modules which will allow installation of increasing amounts of UV lamps in response to increasing wastewater flows as the STAMP Site is developed.

The proposed system utilizes low pressure, high output lamp technology in accordance with energy efficiency best practices. This system will contain two banks of UV lamps to provide redundancy. The UV system will provide a UV dose of 30 mJ/cm^2 at the peak design flows per standards.

Due to grading of the site and the required slopes and depths of the effluent pipe system, the UV channel will be housed within a recessed concrete structure. The operator will utilize a concrete stairway to access the lower level of the structure. All critical electrical panels will be placed at grade level, rather than in the vault to avoid potential damage in the event of a backup. A small davit crane will be installed to help lift the modules from the channel.

G. Screw Press Dewatering

The screw press machines will be installed in the dewatering building. The screw press will be installed above a recessed sump with grated flooring and drain for wash down of the machine. The screw press will be fed from the submersible pumps in the SHTs. The motion of the screw will increase the pressure of the sludge against the screen to dewater the material. The screw press drive and the filtrate recycle pump will be operated on VFDs.

The screw press will be able to process the aerobically digested sludge and will be able to dewater to greater than 20% total solids with 95% solids capture. The system includes a filtrate recycle system to ensure solids capture. An emulsion polymer make-down unit will meter polymer to an injection device adding polymer to the sludge before the screw press.

During pressing, the exterior of the screen is continually washed and following pressing, the screen is washed down. The filtrate will exit the machine from the bottom and will flow through the drain in the sump to the dewater return line to the head of the plant.

The dewater building will be designed for two screw press machines, each sized to handle the sludge generated from the 0.5 MGD SBR plants. The dewatered material will empty into a dump truck that will remove the material from the site for final disposal at a landfill.

H. Site & General Facility

A new asphalt driveway will be installed around the WWTF Site to provide access to the buildings and tanks. The new driveway will connect to the access road to the north of the site. A new generator will be installed on site and connected to the facility in order to provide backup power.

I. Odors

The treatment processes where odors are a concern are contained within buildings to mitigate odors. The only location where raw, untreated wastewater will be exposed to the atmosphere is enclosed within the headworks and control building. The SBR process and aerated sludge process will not produce strong odors. The dewatering process, where aerated sludge is dewatered, will be enclosed within the dewatering building and the material will be immediately removed from the site to the landfill for final disposal following dewatering.

J. Chemical Storage

The chemicals stored on site will include alum for phosphorus precipitation and polymer for screw press dewatering. The alum will be stored in a chemical bulk storage area located in the headworks and control building. The polymer will be stored in a chemical bulk storage area in the dewatering building. The chemical bulk storage areas will include spill prevention measures including double containment equal to the largest storage volume per NYSDEC bulk storage requirements.

VI. Operations

A. Facility Operations

The Town does not have a municipal sanitary sewer collection or conveyance system. Therefore, the GCEDC intends to form a sewer-works corporation to own and operate all STAMP sewer infrastructure including the WWTF.

B. Emergency Response

The local emergency management services such as fire departments and medical services will be trained for emergency safety and response at this facility. Specific procedures such as emergency startup of the backup generator and shutdown of specific equipment will be outlined, and training will be provided by the operators of the facility. The emergency management services will be taught the hazards of the chemicals stored on site. Diesel will be stored in a tank on-site for the emergency backup generator. This tank will be clearly marked, and the concerns will be defined for the emergency management services.

VII. Conclusion

The offsite sanitary sewer project is an integral and critical part of the necessary infrastructure for the STAMP Site. The project design avoids and minimizes potential environmental impacts. The GCEDC is committed to providing safe and reliable wastewater treatment at the onsite WWTF and developing a facility that will meet the current and future needs of water quality and treatment capacity at the STAMP Site. These specific projects will be imperative in achieving these goals.

Figure 1

General Location Map

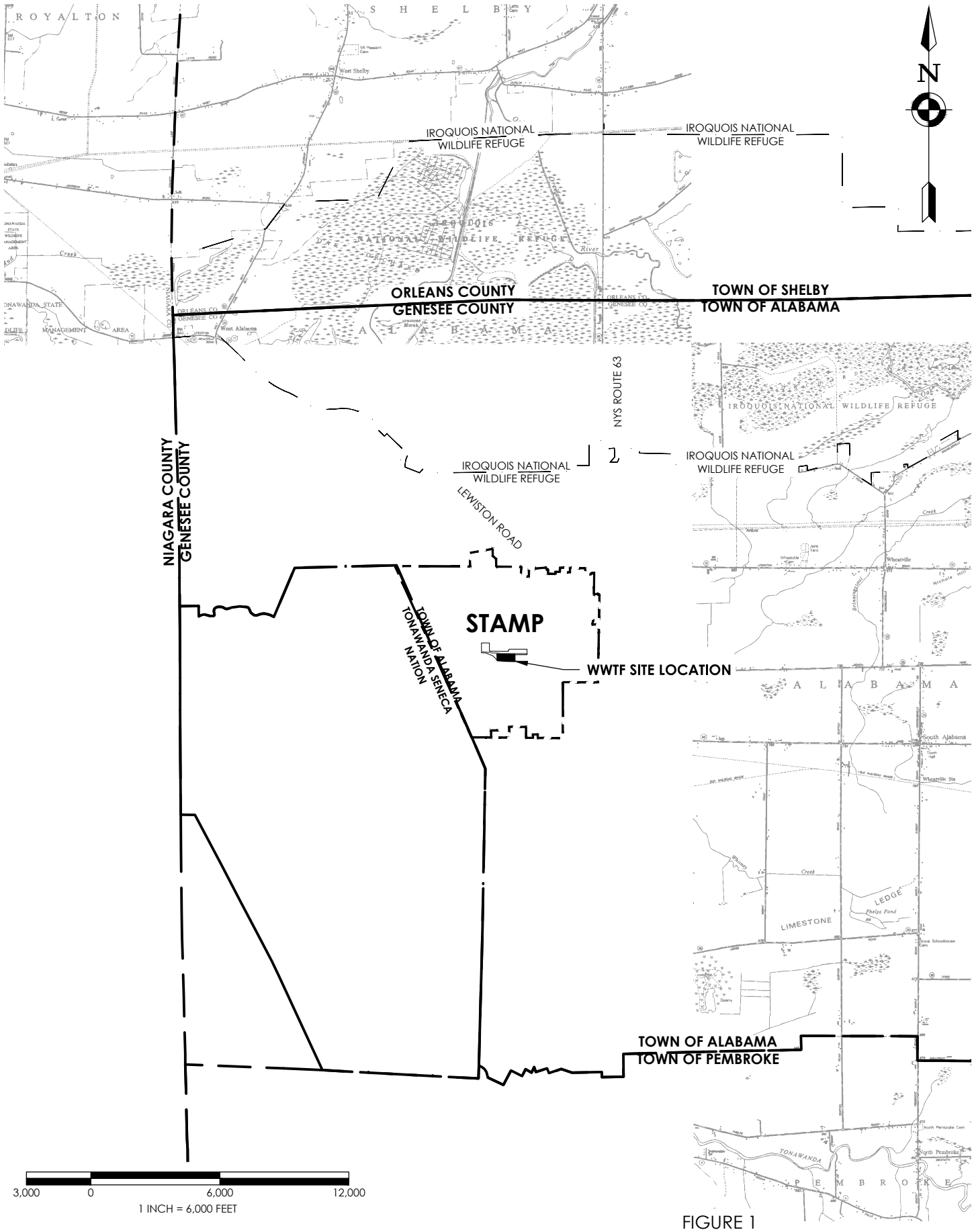


FIGURE 1

205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
CPLteam.com
ARCHITECTURE ▪ ENGINEERING ▪ PLANNING

DATE:	4/27/20
DRAWN:	ZLA
CHECKED:	ARK
SCALE:	AS NOTED
PROJ. #:	14822.00

STAMP SITE GENERAL LOCATION MAP

WNY STAMP OFFSITE SEWER

TOWN OF ALABAMA AND TOWN OF SHELBY, NEW YORK STATE

Referenced Drawings: None
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Date last accessed: 5/18/2020 3:33 PM
Date last plotted: 5/21/2020 8:12 AM
Plotted By: Nick Bayer

Figure 2

Proposed FM Route

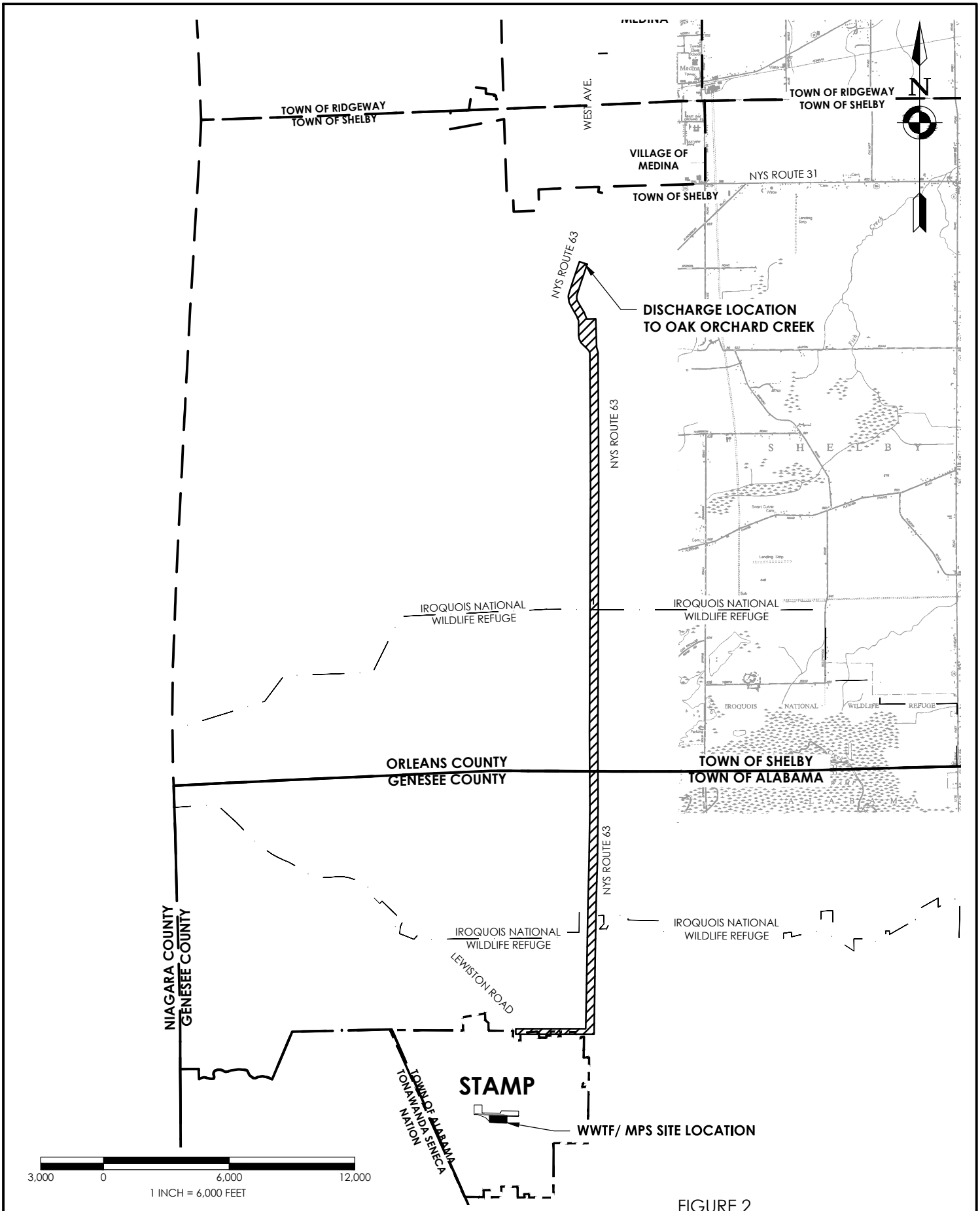


FIGURE 2

205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
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DATE:	4/27/20
DRAWN:	ZLA
CHECKED:	ARK
SCALE:	AS NOTED
PROJ. #:	14822.00

FORCE MAIN GENERAL LOCATION MAP

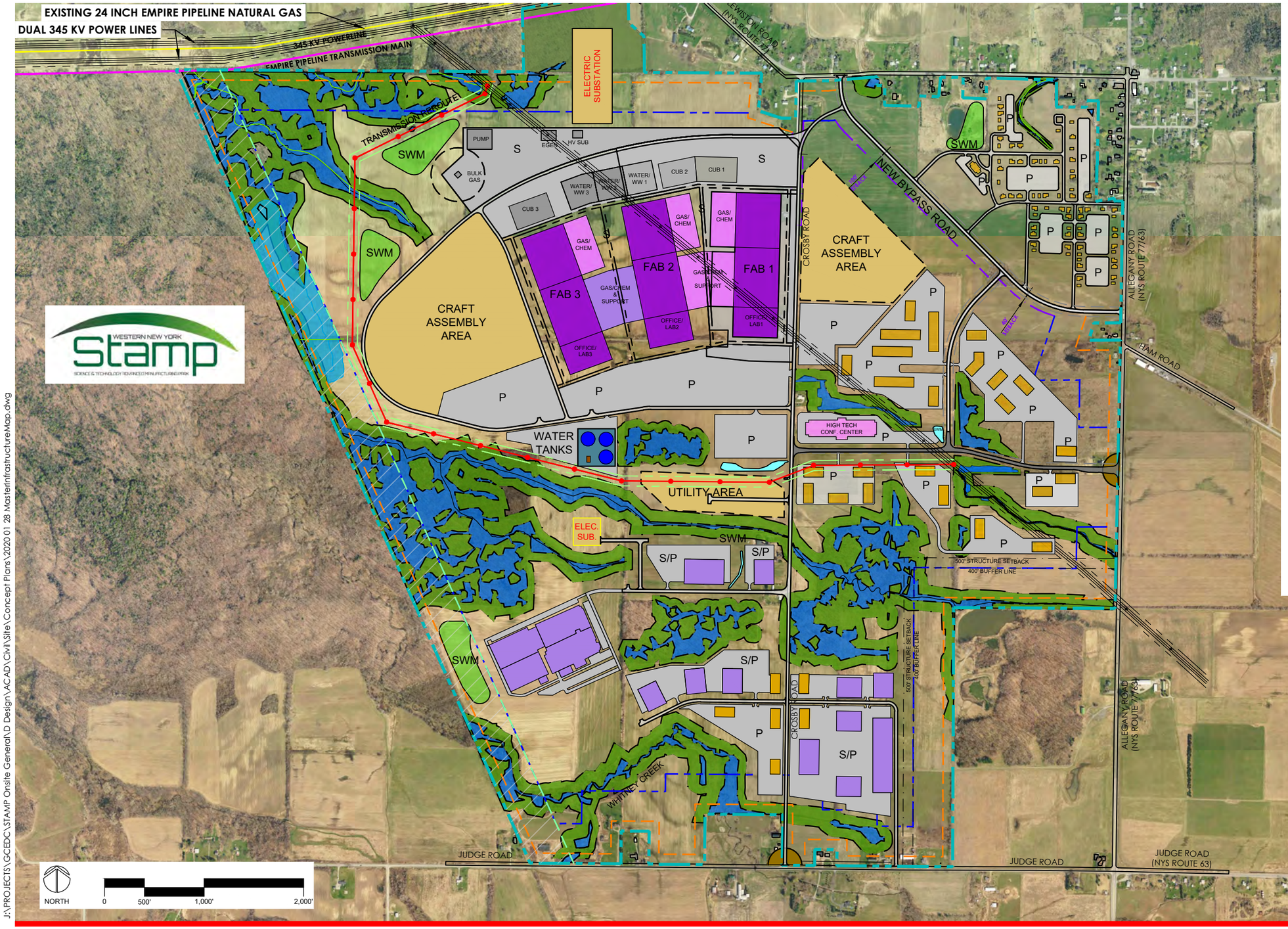
WNY STAMP OFFSITE SEWER

TOWN OF ALABAMA AND TOWN OF SHELBY, NEW YORK STATE

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Date last plotted: 5/26/2020 2:14 PM
Plotted By: Zach Anderson

Figure 3

Overall STAMP Site Plan



LEGEND

- STAMP BOUNDARY
- WESTERN BOUNDARY BUFFER
- PUBLIC ROADS
- DRAINAGE WAYS
- WALKING TRAILS
- SNOWMOBILE TRAILS
- 100' AG RESIDENTIAL BUFFER
- 300' OPEN SPACE BUFFER
- 500' STRUCTURE SETBACK
- ZONING SETBACK
- RELOCATED POWER LINE AND SETBACK
- PROPOSED TRIBUTARY 3 ROUTE
- DELINEATED WETLANDS
- FOREST/REFOREST/WETLANDS
- PROPOSED WETLAND MITIGATION AREA
- STORMWATER MANGEMENT FACILITIES
- EXISTING STORMWATER MANAGEMENT
- STREET TREES
- P S SURFACE PARKING / SERVICE YARDS
- SITE ENTRANCE POINT

FIGURE 3

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STAMP - MASTER BUILD OUT PLAN

WNY SCIENCE AND TECHNOLOGY ADVANCED MANUFACTURING PARK (STAMP)

JUNE 2020

Figure 4

MPS and WWTF Site Plan

NEW 2" DR-9 HDPE WATER SERVICE

NEW UTILITY PARCEL ACCESS ROAD (BY OTHERS)

UTILITY EASEMENT

UTILITY ACCESS ROAD

UTILITY EASEMENT

UTILITY ACCESS ROAD

UTILITY EASEMENT

TREATED PROCESS WASTEWATER

DISCHARGE TO OAK ORCHARD CREEK

UTILITY EASEMENT

HEADWORKS BUILDING

UTILITY AREA

SLUDGE HOLDING TANK 6 | PRE REACT ZONE 6 | SBR 6 REACTION ZONE

SLUDGE HOLDING TANK 5 | PRE REACT ZONE 5 | SBR 5 REACTION ZONE

SLUDGE HOLDING TANK 4 | PRE REACT ZONE 4 | SBR 4 REACTION ZONE

SLUDGE HOLDING TANK 3 | PRE REACT ZONE 3 | SBR 3 REACTION ZONE

SLUDGE HOLDING TANK 2 | PRE REACT ZONE 2 | SBR 2 REACTION ZONE

SLUDGE HOLDING TANK 1 | PRE REACT ZONE 1 | SBR 1 REACTION ZONE

DISTRIBUTION STRUCTURE

TRENCH DRAIN

DISC FILTER BUILDING

UV BUILDING

DEWATERING BUILDING

MAIN PUMP STATION

KEY NOTES:

1. 16" INFLUENT PIPE
2. 16" DISTRIBUTION PIPES
3. 6" FILTRATE RETURN PIPE
4. X" SHT SLUDGE WITHDRAWAL PIPE
5. 16" EFFLUENT PIPE TO UV

REVISIONS				
NO.	DATE	BY	CHKED	DESCRIPTION

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FAX (585) 232-5836
CPLteam.com
ARCHITECTURE = ENGINEERING = PLANNING

GENESEE COUNTY ECONOMIC DEVELOPMENT CENTER

TOWN OF ALABAMA GENESEE COUNTY NEW YORK STATE

DATE: 04/27/2020
DRAWN: MCZ
DESIGNED: NAB
CHECKED: TAC
SCALE: 1"=60'

STAMP ONSITE WASTEWATER TREATMENT FACILITY

WWTF AND MPS SITE PLAN

PROJECT NUMBER 14822.00

DRAWING NUMBER FIGURE 4

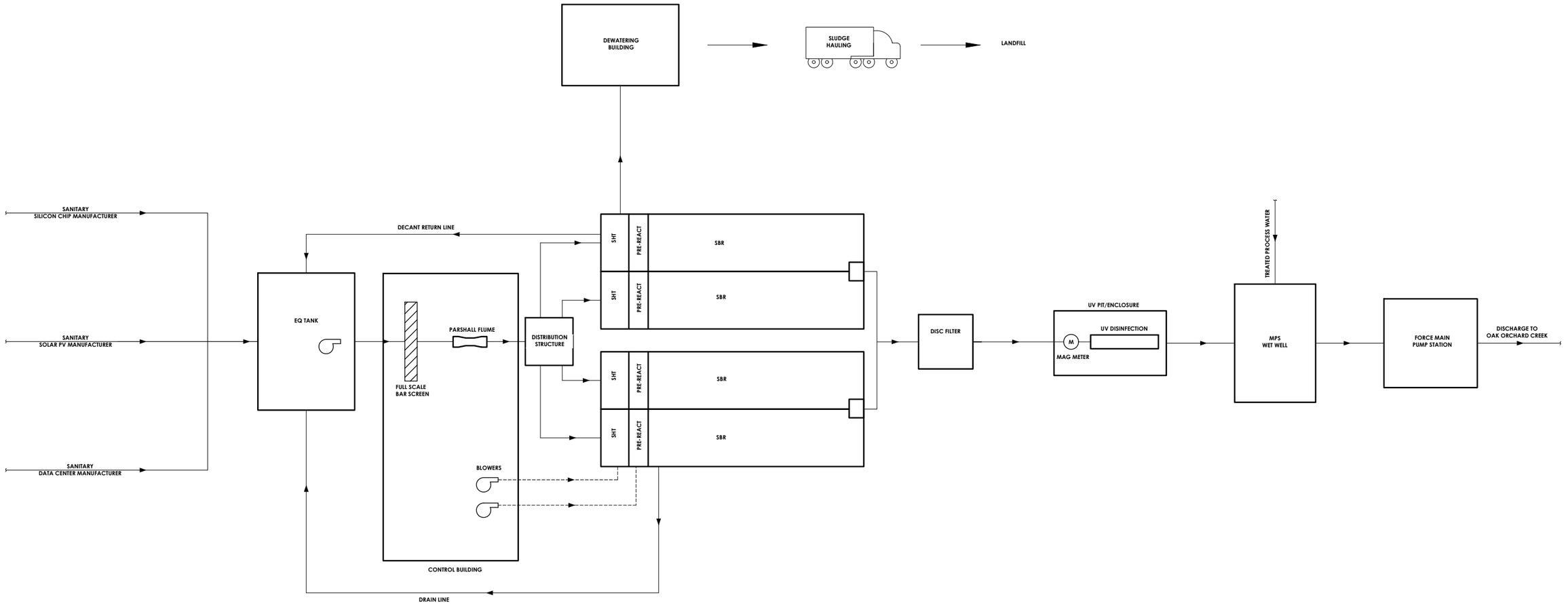
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Plotted By: Nick Boyer

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND THE COMMISSIONER'S REGULATIONS FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, ENGINEER OR LAND SURVEYOR, TO ALTER ANY WAY A SURVEY OF AN ITEM BEARING THE SEAL OF AN ARCHITECT, ENGINEER OR SURVEYOR AS ALTERED BY FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION

Figure 5

WWTF Process Flow Diagram

Plotted By: Nick Boyer
Date last plotted: 5/13/2020 4:19 PM
Date last accessed: 5/13/2020 3:00 PM
Referenced Drawings: None
Drawing Name: J:\PROJECTS\GCEDC\stamp onsite wwtf\D Design\ACAD\Civil\General\G-02_STAMP WWTF_PROCESS FLOW DIAGRAM.dwg



REVISIONS				
NO.	DATE	BY	CHKED	DESCRIPTION

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ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
CPLteam.com
ARCHITECTURE ▪ ENGINEERING ▪ PLANNING

GENESEE COUNTY ECONOMIC DEVELOPMENT CENTER

TOWN OF ALABAMA GENESEE COUNTY NEW YORK STATE

DATE:	04/27/2020
DRAWN:	MCZ
DESIGNED:	NAB
CHECKED:	ARK
SCALE:	NTS

STAMP ONSITE WASTEWATER TREATMENT FACILITY

PROCESS FLOW DIAGRAM FULL-BUILD SBR ALTERNATIVE

PROJECT NUMBER 14822.00

DRAWING NUMBER FIG 5

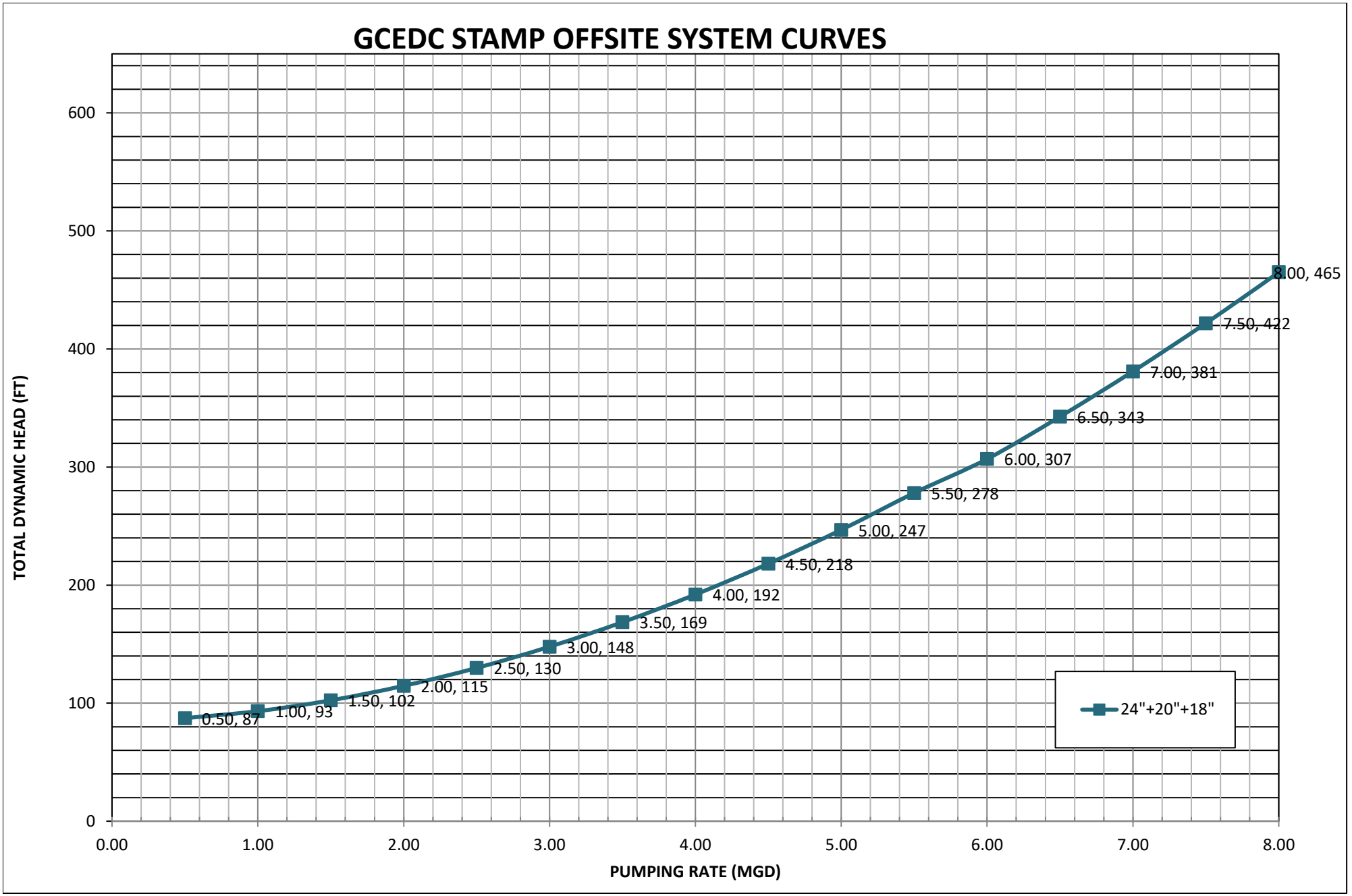
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Appendix A

FM System Curve

GCEDC

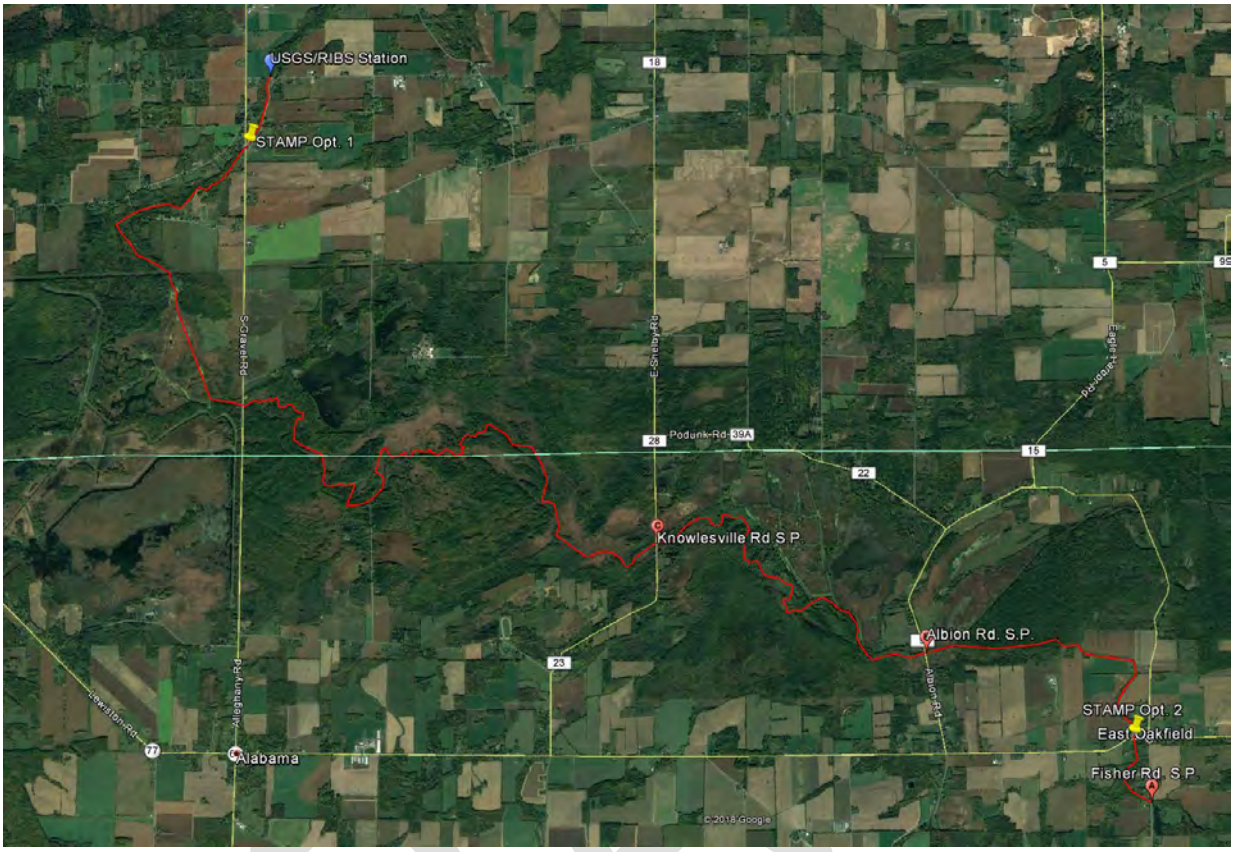
STAMP OFFSITE SEWER



Appendix B

WWTF Draft SPDES Permit Limits

Genesee County STAMP SPDES Permit Preliminary Limits Evalulation



OUTFALL OPTIONS

Option 1 – South Gravel Road Outfall

Lat/Long: 43° 09’ 58”, -78° 23’ 25”
Receiving waterbody: Oak Orchard Creek (Class C)
Impairments: Non-point source phosphorus (agriculture), not on 303(d) list
7Q10: 0.46 MGD
Dilution ratio: 0.5:1

Option 2 – Lewiston Road Outfall

Lat/Long: 43° 05’ 54”, -78° 15’ 00”
Receiving waterbody: Oak Orchard Creek (Class C)
Impairments: Non-point source phosphorus (agriculture), not on 303(d) list
7Q10: 0 MGD (ISEL as per TOGS 1.3.1)
Dilution ratio: 0:1

DRAFT

EFFLUENT CONDITIONS

Up to 1 MGD (by Phase 2) of industrial and sanitary wastewater, possibly covered under one or more ELG (433, 469, etc.). Treatment to consist of pH adjustment, MBRs, WQ tank, chemical precipitation, and filter press.

ANTICIPATED SPDES PERMITS REQUIREMENTS

Option 1 – South Gravel Road Outfall

Parameter	Limit/Monitoring	Type	Notes
Flow Rate	1.0 MGD	Daily Max.	Design Q
pH	6.0-9.0 S.U.	Range	TBEL/ELG
Temperature	Monitor	Daily Max.	BPJ
BOD5	5.0 mg/L	Daily Max.	ISEL
UOD	Monitor	Calculation	BPJ
TDS	500 mg/L	Daily Max.	TBEL/WQBEL
TSS	10 mg/L	Daily Max.	ISEL
Settleable Solids	0.1 mL/L	Daily Max.	TBEL w/ filtration
Ammonia, Nitrogen (as N)	1.2 mg/L, summer 1.9 mg/L, winter	Monthly Avg.	WQBEL
Total Kjeldahl Nitrogen	Monitor	Monthly Avg.	BPJ
Phosphorus, Total	0.20 mg/L	Daily Max.	TOGS 1.3.6, DEC policy
Oil & Grease	15 mg/L	Daily Max.	ELG may be less stringent
Fecal Coliform	200/400 CFU/100mL	7-/30-day Geo. Mean	WQBEL
Dissolved Oxygen	5.0 mg/L	Avg. Minimum	Part 703
Chlorine, Total Residual	0.030 mg/L	Daily Max.	ML
Aluminum, Total	Monitor	Daily Max.	BPJ
Cadmium, Total	--	--	Applied according to ELG applicably
Chromium, Total	--	--	Applied according to ELG applicably
Copper, Total	Monitor	Daily Max.	BPJ
Fluoride, Total	--	--	Applied according to ELG applicably
Iron, Total	1.2 mg/L	Daily Max.	TBEL
Lead, Total	--	--	Applied according to ELG applicably
Mercury, Total	50 ng/L, MMP	Daily Max.	MDV
Nickel, Total	--	--	Applied according to ELG applicably
Thallium, Total	12 ug/L or Monitor	Daily Max.	WQBEL/BPJ
Silver, Total	--	--	Applied according to ELG applicably
Zinc, Total	0.40 mg/L	Daily Max.	TBEL
Cyanide, Total	--	--	Applied according to ELG applicably
Total Toxic Organics	--	--	Applied according to ELG applicably
WET Testing	0.3 TUa/1.0 TUc	Chronic Only	TOGS 1.3.2

Appendix C

WWTF Basis of Design Equipment Selection

1. Mechanical Bar Screen, Washer Compactor
2. Sequential Batch Reactor (SBR) Design Calculations
3. Disc Filter Sizing and Equipment Selection
4. UV Disinfection Sizing and Equipment Selection
5. Screw Press Sizing and Equipment Selection

Mechanical Bar Screen, Washer Compactor

Duperon® ADAPTIVE TECHNOLOGY™
PRELIMINARY LIQUIDS/SOLIDS SEPARATION SYSTEMS

Date: June 12, 2019

Project: STAMP WWTP Medina NY **Proposal Number:** P10211

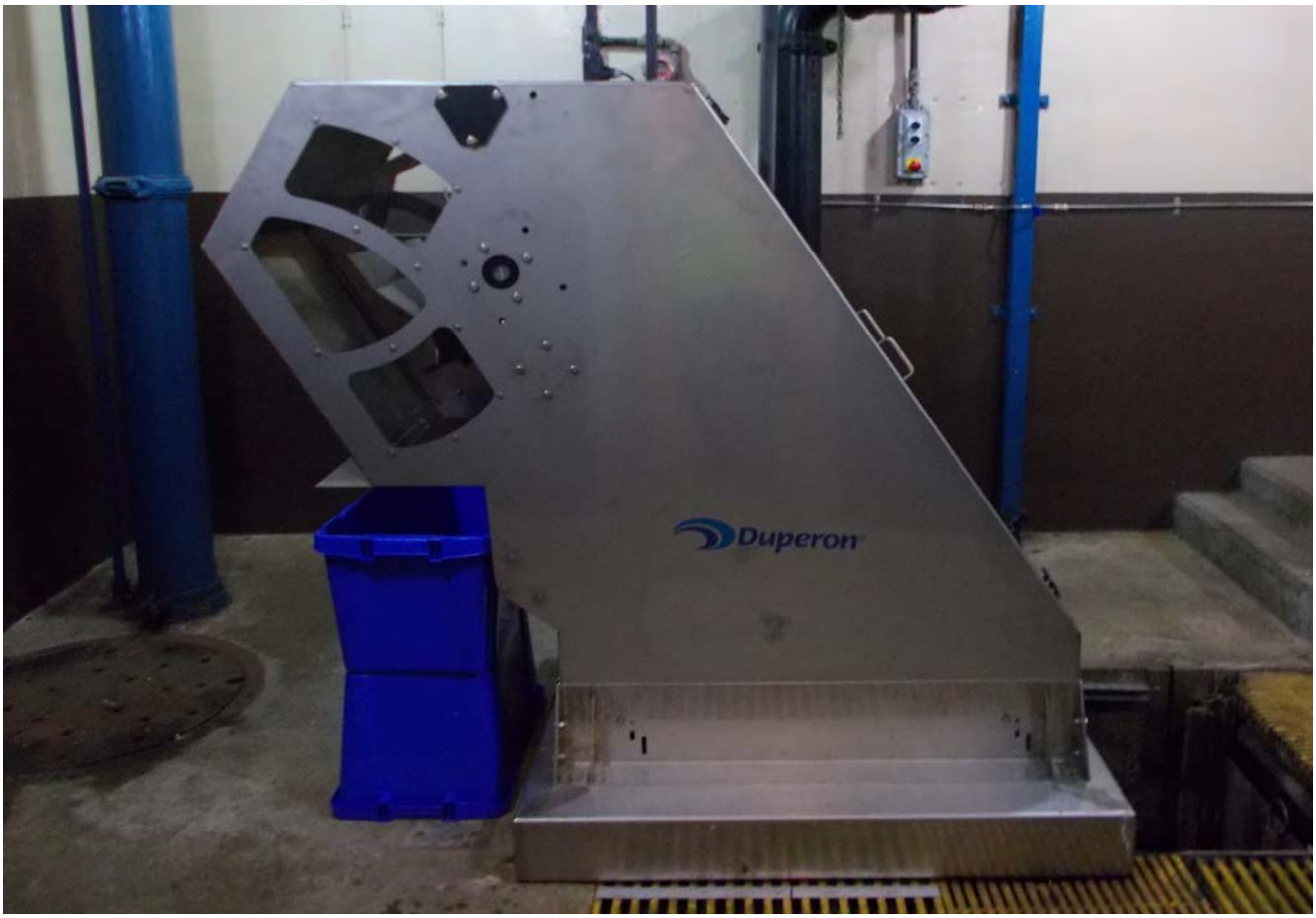
PRELIMINARY BUDGET EQUIPMENT SCOPE

To: STAMP WWTP Medina NY

From: **Your Duperon® Team**
Dan Satryano
Sales Project Manager
(989) 754-8800
dsatryano@duperon.com

Rep: Wayne Dodsworth
Sales Engineer
Koester Associates, Inc.
(315)6973800
wayned@koesterassociates.com

Lorene Bruns
National Sales Manager
(989) 754-8800
lbruns@duperon.com



Duperon® ADAPTIVE TECHNOLOGY™
PRELIMINARY LIQUIDS/SOLIDS SEPARATION SYSTEMS

Date: June 12, 2019

Project: STAMP WWTP Medina NY **Proposal Number:** P10211

PRELIMINARY BUDGET EQUIPMENT SCOPE

Thank you for considering **Duperon®** system solutions for your project. We appreciate the opportunity to provide you with a **Preliminary Budget Equipment Scope**. Please do not hesitate to contact your **Duperon® Team** with any questions as we work with you through the design process and ensure a successful project.

Equipment Scope

SCREENS:

QTY	UNIT	DESCRIPTION		
1	EA	**Duperon® FlexRake® - Front Clean Front-Return**		
		Model:	LF - LowFlow	
Notes:	Based on 4ft channel height. Please note the Low Flow screen was not designed to manage septage.	Enclosure (& Material):	Fully Enclosed (304)	
		Channel Width x Height:	1.5 x 4	Feet
		Clear Opening Size:	0.25 in	
		Angle of Installation:	30	Deg. from Vertical
		Material Construction:	304	SSTL

CONTROLS

QTY	UNIT			
1	EA	**Main Control Panel:**	**1 - LF**	
		Power:	480V/3ph/60hz	
Notes:	Pre-engineered controls package included. Changes to scope will have cost impacts.	Panel Rating:	NEMA 4X	
		PLC/Relay Based:	Relay	
		Screen Instrumentation:	Dual Mechanical Float	
		Local Pushbutton Station(s):	Three Button (E-Stop/Run/Jog Rev)	

TECH/FREIGHT

QTY	UNIT	DESCRIPTION		
1	LOT	**On-Site Technical Assistance**		
		Number of Trips:	1	Trip(s)
		Days On-Site per Trip:	1	8-hour man-day(s)
1	LOT	**Freight**		
		FOB Factory, Full Freight Allowed		

Clarifications:

- This is not a fully designed project; preliminary pricing may be affected by scope change/project development
- Operational, structural, wind, or seismic calculations are not included
- Scope is based on models and assumptions widely utilized in the industry
- Scope does not convey an offer to sell; installation and taxes are not included
- **For reference only:** Standard Delivery Schedule: Submittals 4-6 week from PO - Delivery 8-12 weeks from approval

PRELIMINARY BUDGET PRICING:

Duperon ADAPTIVE TECHNOLOGY™
Let's Build a System that Works for You™

Date: May 17, 2019
Project: STAMP WWTP - Medina, NY
Number: P10211

HYDRAULIC CALCULATIONS

Notes: 3 MGD Phase 3 Peak Flow, 0.25" Bar Openings, 25% Blinding

INPUT: Channel Physics

Flow in MGD	3.00	MGD
Upstream water level	2.50	ft
Channel width	1.50	ft
Channel depth	4.00	ft
Degree of blinding	25%	

INPUT: Screen Physics

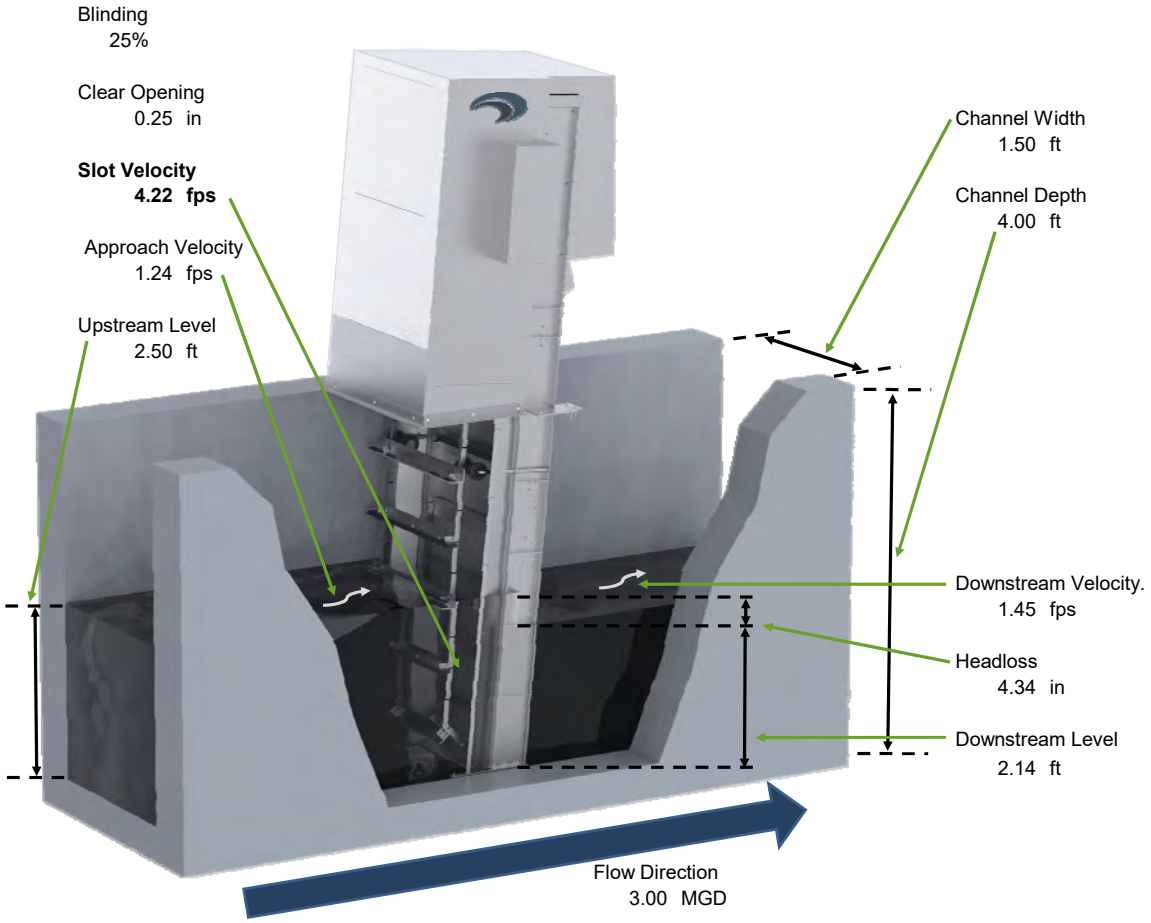
Clear Opening	0.25	in
Bar thickness	0.25	in
Thickness of side fab and closeout (2)	0.33	ft

Calculations

Side fab & closeout area	0.83	sft
Flow area between side fab & closeouts	2.93	sft
Number of bars	28.00	ea
Flow area taken up by bars	1.46	sft
Total Channel flow without screen	3.75	sft
Flow area after screen area and blinding taken out	1.10	sft
Approach Velocity	1.24	fps
Slot Velocity	4.22	fps
Downstream Velocity	1.45	fps
Downstream Depth	2.14	ft
Head Loss	4.34	in

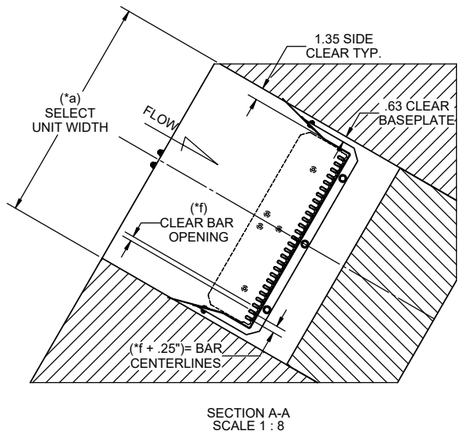
Bernoulli Calculations

Velocity thru bar screen	4.22	fps
Velocity upstream of bar screen	1.24	fps
Gravitational acceleration (constant)	32.20	ft/s^2
Frictional coefficient (constant)	1.43	c
Headloss	0.36	ft
Headloss	4.34	inches

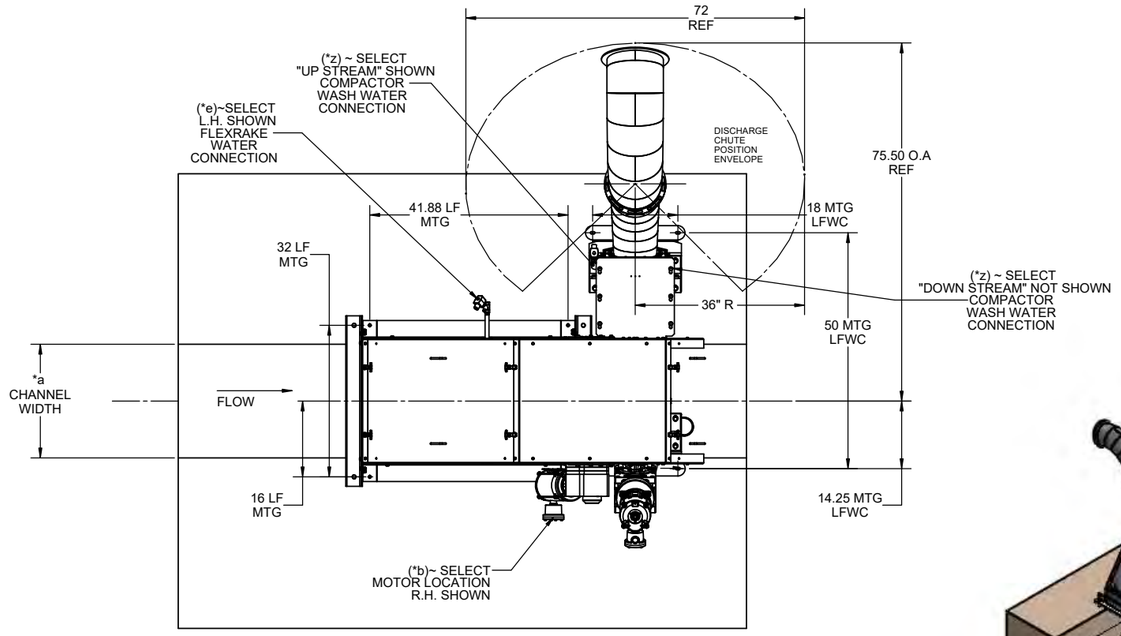


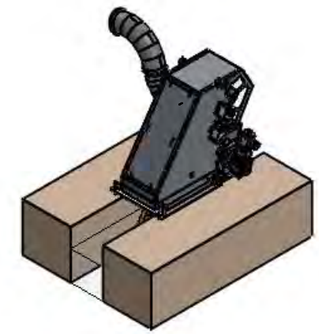
These calculations are an estimation based upon the information available. Flow channel hydraulics are highly dependent on water levels and the degree of blinding. The calculations above are a snapshot of only one condition. To fully analyze the hydraulics please contact your local Duperon representative.
Duperon recommends a minimum of 1.00 ft water depth when the unit is in operation to keep the SSTL FlexLinks lubricated and ensure an optimal amount of screening area.
Duperon recommends using Water Environment Federation (WEF) & "10 States" standards as design guidelines:
Approach velocity should be greater than 1.25 ft/s to prevent settling. Slot velocities should be less than 4 ft/s to prevent forcing material thru openings.

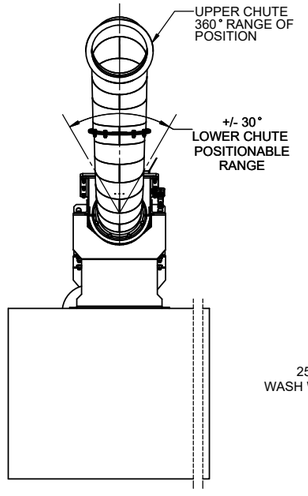
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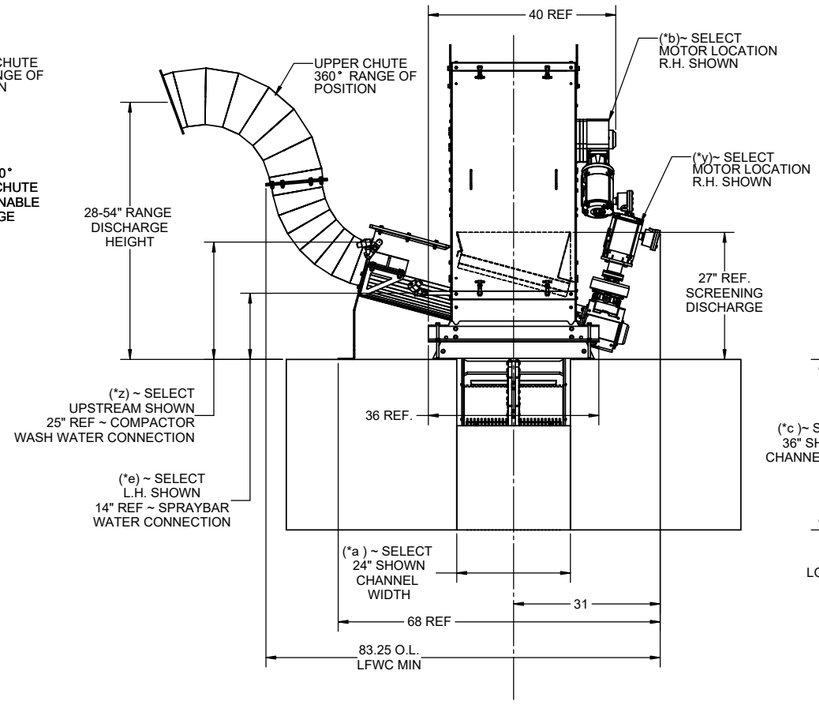


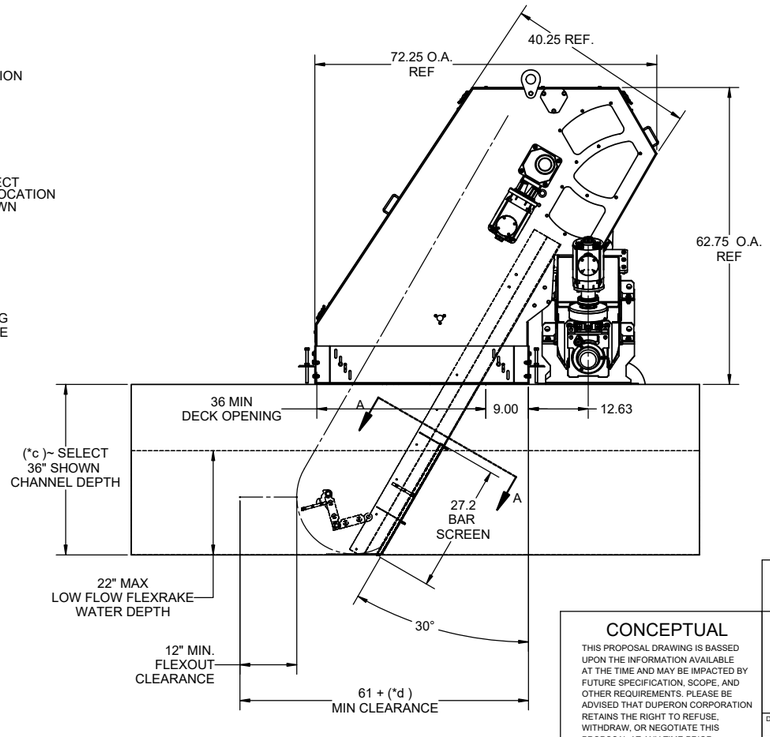
SECTION A-A
SCALE 1 : 8











SHOWN WITH STANDARD (2)-PIECE "POSITIONABLE" DISCHARGE CHUTES.
OTHER CHUTE CONFIGURATIONS AND LENGTHS AVALIABLE.
CONSULTE DUPERON PRODUCT ENGINEERING.

VERIFICATION BLOCK

WASHER COMPACTOR SELECTIONS

Please Circle One:

WATER SUPPLY CONNECTION:
(*z) = UPSTREAM or DOWNSTREAM

MOTOR LOCATION:
(*y) = RH or LH

DEBRIS BIN HEIGHT: _____

INDOOR OR OUTDOOR

FLOWS:
PEAK _____
AVERAGE _____

WATER LEVEL:
PEAK _____
AVERAGE _____

FLEXRAKE SELECTIONS

Please Circle One:

UNIT WIDTH:
(*a) = 12" 18" 24"

MOTOR LOCATION:
(*b) = RH or LH

CHANNEL HIEGHT:
(*c) = 2'-0" 2'-6" 3'-0" 3'-6 4'-0"
4'-6" 5'-0" 5'-6" 6'-0"

CHANNEL DEPTH CLEARANCE:
MINIMUIM NEEDED AT 3FT DEEP.
(*d) =ADD 3.5" FOR EVERY 6"
INCREASE OF DEPTH.

SUPPLY WATER CONNETION:
(*e) = RH or LH

CLEAR BAR OPENING:
(*f) = 1/4" 1/2" 3/4" 1"

-TEMPLATE-

CONCEPTUAL

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DIMENSIONING & TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1982

TOLERANCES - UNLESS OTHERWISE SPECIFIED
.X ±0.13
.XX ±0.06
.XXX ±0.009
.XXXX ±0.0009
ANGULAR ±0.5°

DRAWN	WED	DATE 04/03/19
CHECKED	CA	DATE ?/?/19
APPROVED	-	DATE
APPROVED	-	DATE

Duperon®
Saginaw, Michigan 48601
TF 800.383.8479

SHEET TITLE
DUPERON CORPORATION LOW FLOW SYSTEM LAYOUT

PART NAME
FLEXRAKE & LFWC SELECTIONS

SIZE	FSCM NO.	DWG. NO.	REV
D		-	-

SCALE 1:16 SHEET 1 OF 1

Sequential Batch Reactor (SBR) Design Calculations

DESIGN PROPOSAL

Stamp, NY Sanitaire #a29193-18

Max Month*	MGD	0.510	
Max 4.0hr Cycle Flow	MGD	0.765	
Max 3.0hr Cycle Flow	MGD	1.020	
		mg/l	lb/day
BOD_5 (20°C)		300	1276
Suspended Solids		250	1063
TKN(Assume 1.5 (NH3-N) = TKN)		60	255
NH3-N		40	170
Total Phosphorus		4	17
Max Wastewater Temperature	°C	20	
Min Wastewater Temperature	°C	6	
Ambient Air Temperature	°F	20 - 90	
Site Elevation	ft	500	

*** - Maximum 30 day period mass flow**

Table B: ICEAS® EFFLUENT QUALITY (MONTHLY AVERAGE)

BOD_5 (20°C)	mg/l	10.0
Suspended Solids	mg/l	10.0
NH_3-N	mg/l	1.2
Total Phosphorus	mg/l	0.8

*Requires chemical precipitation

Table C: ICEAS PROCESS DESIGN CRITERIA

Operating Basins		3
Operating Top Water Level	ft	15.00
F / M	BOD5/DAY/MLSS	0.039
SVI (after 30 minutes settling)	ml/g	150
MLSS at Bottom Water Level	mg/l	5,080
Waste Sludge Produced (Approx.)	lb/day	969
Volume of Sludge Produced (Approx., 0.85% solids)	GPD	13,700
Normal Decant Rate	GPM	708
Peak Decant Rate	GPM	944
Hydraulic Retention Time	Days	1.62
Sludge Age	Days	32.0
Alkalinity	mg/l	295
Chemical Dosage (as Alum)	mg/l	42

Bold, italicized text indicate assumptions made by Sanitaire

Cycle Timing

		Max Month*	
		Normal	Min
Air-On	min	120	90
Settle	min	60	45
Decant	min	60	45
Total	min	240	180

Table D: KEY ICEAS DESIGN DETAILS

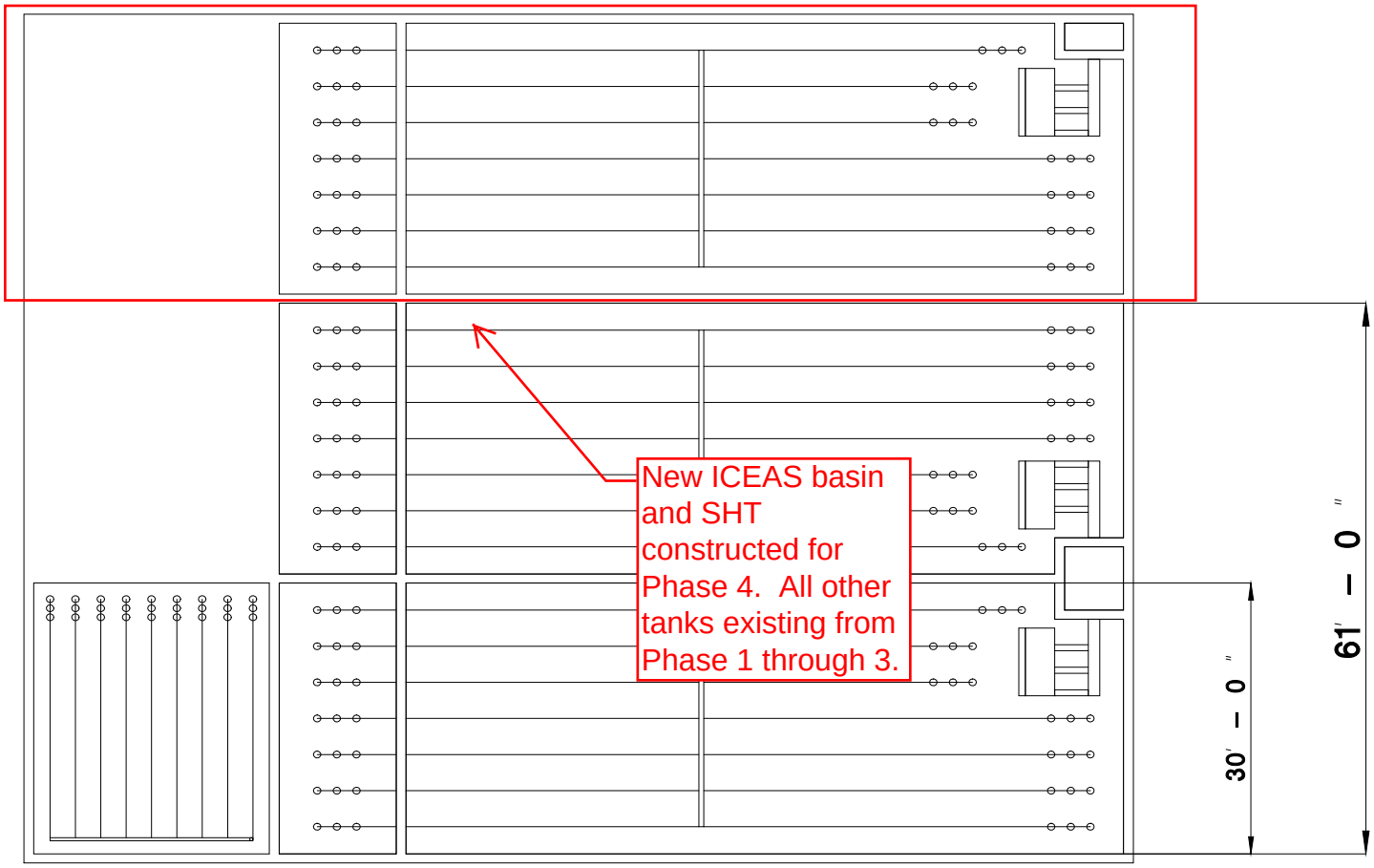
Top Water Level	ft	15.00
Basin Width (Inside)	ft	30.0
Basin Length (Inside)	ft	86.0
Bottom Water Level	ft	13.33
No. of Sludge Holding Tanks		3
SHT Top Water Level	ft	15.0
SHT Width	ft	25.0
SHT Length	ft	30.0
Sludge Storage Time	days	10

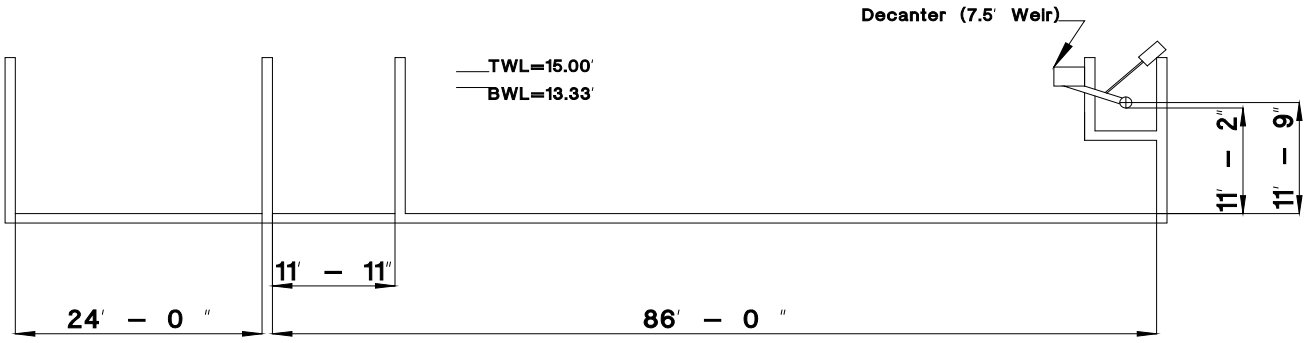
ICEAS EQUIPMENT(Base Design)						Motor HP	No. Req.
Decanter Mechanism	7.5	' Weir length					3
Decanter Drive Unit						1/4	3
ICEAS Blower	440	SCFM	7.3	PSIG		30	3
ICEAS Fine Bubble Aeration System	280	Disc Diffusers/Basin					3
Air Control Valve	6	"					3
Waste Sludge Pump	110	GPM				2.4	3
ICEAS Controls							1
SHT Blower	320	SCFM		7.5	PSIG	25	4
SHT Aeration System	225	Disc Diffusers/Basin					3

ICEAS POWER REQUIREMENTS	Max Month		(At Average Aeration Depth)			Kwh/Day
Decant Drive Unit	0.2 BHP	3 run	@	6 Hrs/day		2.7
ICEAS Air Blowers	22.6 BHP	1 run*	@	24 Hrs/day		404.6
ICEAS Air Blowers	22.6 BHP	1 run**	@	12 Hrs/day		202.3
Waste Sludge Pump	1.9 BHP	3 run	@	0.7 Hrs/day		3.0
				KWH/DAY		612.6
			AVERAGE	KWH/HR		25.53

* Shared ICEAS Blowers
** Dedicated ICEAS Blowers

SHT Blower	19.3 BHP	3 run	@	18 Hrs/day		775.60
				KWH/DAY		1,388.20
			AVERAGE	KWH/HR		57.84





PRELIMINARY - THIS DRAWING IS NOT INTENDED FOR CONTRACT DOCUMENTS, SUBMITTALS, OR CONSTRUCTION

Sanitaire a xylem brand BROWN DEER, WISCONSIN 53223	CUST NO. DWG NO.	THIS DRAWING IS THE PROPERTY OF XYLEM AND IS SUBMITTED IN CONFIDENCE. IT IS NOT TO BE DISCLOSED, USED OR DUPLICATED WITHOUT PERMISSION OF XYLEM.	Stamp, NY PRELIMINARY LAYOUT ICEAS System	DRAWN BY TDB CHKD BY APPVD BY	DATE 4/30/20 DATE DATE		JOB a29193–18 SHEET

Design Parameters

A. Flow

Max Month	510,000	GPD
Max 4.0hr Cycle Flow	765,000	GPD
Max 3.0hr Cycle Flow	1,020,000	GPD

B. Treatment

	Influent Quality	Effluent Requirement
BOD_5 (20°C), mg/l	300	10
Suspended Solids, mg/l	250	10
TKN, mg/l	60	
NH_3-N, mg/l		1
TN, mg/l		
Phosphorus	4	0.8

C. Environment

Alkalinity (Minimum Requirement)	300	mg/l
Max Wastewater Temperature	20	°C
Min Wastewater Temperature	6	°C
Ambient Air Temperature	20 - 90	°F
Site Elevation	500	ft

D. ICEAS Process Design Criteria

F / M	0.047	BOD_5 / MLSS / day
SVI (after 30 minutes settling)	150	ml/g
Number of ICEAS Basins	3	
Top Water Level	15	ft

E. Cycle Timing

		Normal	Storm
Air-On	min	120	90
Air-Off	min		
Settle	min	60	45
Decant	min	60	45
Total	hrs	4	3

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F. Detailed Calculations

Mass of BOD

$$BODL = \frac{Q \times BODin \times 8.34}{1{,}000{,}000} = \frac{170{,}000 \times 300 \times 8.34}{1{,}000{,}000} = \mathbf{425\ lb/day/basin}$$

where: BODL = BOD Load (lb/day/basin)
Q = Average Dry Weather Flow per basin (gal/day)
BODin = Influent BOD concentration (mg/l)
1,000,000 = Conversion (l/mg)
8.34 = Conversion (lb/gal)

Mass of Biomass

$$BMOB = \frac{BOD_L}{F/M} = \frac{425}{0.0395} = \mathbf{10{,}778\ lb/basin}$$

where: BMOB = Mass of Biochemicalmass (lb/day/basin)
F / M = Food to Microorganism ratio (day^{-1})

Volume of Biomass

$$Vbio = BMOB \times SVI = 10{,}778 \times 2.4 = \mathbf{25{,}867\ ft^3/basin}$$

where: Vbio = Volume of Biochemicalmass (ft^3/basin)
SVI = Sludge Volume Index (ft^3/lb)

Maximum Volume Above Bottom Water Level

Peak Dry Weather Flow:

$$Vbwld = \frac{PDWF \times (NCT - NDT)}{24 \times 7.48} = \frac{255{,}000 \times (4.0 - 1.00)}{24 \times 7.48} = \mathbf{4{,}261\ ft^3/basin}$$

where: Vbwld = Maximum Volume Above BWL at Peak Dry Weather Flow (ft^3/basin)
PDWF = Peak Dry Weather Flow (gal/day)
NCT = Normal Cycle Time (hr/cycle)
NDT = Decant Time (hr/cycle)
7.48 = Conversion (gal/ft^3)
24 = Conversion (hours/day)

Peak Wet Weather Flow:

$$Vbwls = \frac{PWWF \times (SCT - SDT)}{24 \times 7.48} = \frac{340{,}000 \times (3.0 - 0.75)}{24 \times 7.48} = \mathbf{4{,}261\ ft^3/basin}$$

where: Vbwls = Maximum Volume Above BWL at Peak Wet Weather (Storm) Flow (ft^3/basin)
PWWF = Peak Wet Weather Flow (gal/day)
SCT = Storm Cycle Time (hr/cycle)
SDT = Storm Decant Time (hr/cycle)

MVAB (Maximum Volume Above Bottom Water Level) is larger of Peak Dry Weather and Peak Wet Weather Calculation

MVAB = **4,261 ft^3/basin**

Decant Rates

Peak Dry Weather Flow:

$$PDR = \frac{MVAB \times 7.48}{NDT} + \frac{PDWF}{1{,}440} = \frac{4{,}261 \times 7.48}{60.0} + \frac{255{,}000}{1{,}440} = \mathbf{708\ gal/min}$$

where: PDR = Normal Decant Rate (gal/min)
NDT = Normal Decant Time (min/cycle)
1440 = Conversion (min/day)

Peak Wet Weather Flow:

$$PWR = \frac{MVAB \times 7.48}{SDT} + \frac{PWWF}{1{,}440} = \frac{4{,}261 \times 7.48}{45.0} + \frac{340{,}000}{1{,}440} = \mathbf{944\ gal/min}$$

where: PWR = Peak Decant Rate (gal/min)
SDT = Storm Decant Time (min/cycle)

Decanter Sizing

Peak Dry Weather Flow:

$$DLa = \frac{PDR}{\text{Weir Loading Rate} \times 7.48} = \frac{708}{20 \times 7.48} = \mathbf{4.73\ ft}$$

where: DLa = Decanter Length for Average Dry Weather Flow (ft)
20 = Weir Loading Rate (ft^3/min/ft of decanter weir)

Peak Wet Weather Flow:

$$DLp = \frac{PWR}{\text{Weir Loading Rate} \times 7.48} = \frac{944}{25 \times 7.48} = \mathbf{5.05\ ft}$$

where: DLp = Decanter Length for Peak Wet Weather (Storm) Flow (ft)
25 = Weir Loading Rate (ft^3/min/ft of decanter weir)

Design Decanter Length = **7.5 ft**

Basin Working Volume

$$BWV = MVAB + Vbio = 4{,}261 + 25{,}867 = \mathbf{30{,}128\ ft^3/basin}$$

where: BWV = Basin Working Volume (ft^3/basin)
Vc = Volume of chemical sludge due to Phosphorus removal (ft^3/basin)
(Please refer to phosphorus removal calculation.)

Basin Area

$$BA = \frac{BWV}{TWL - BZ} = \frac{30{,}128}{15.0 - 3.2} = \mathbf{2{,}550\ ft^2/basin}$$

where: BA = Basin Area (ft^2)
TWL = Top Water Level (ft)
BZ = Buffer Zone (ft) (Safety Factor)

Sludge Depth

$$SD = \frac{Vbio}{BA} = \frac{25{,}867}{2{,}550} = \mathbf{10.14\ ft}$$

where: SD = Sludge Depth (ft)

Decanter Draw Down

$$DD = \frac{MVAB}{BA} = \frac{4{,}261}{2{,}550} = \mathbf{1.67\ ft}$$

where: DD = Draw Down (ft)

Bottom Water Level

$$BWL = SD + BZ + Vd = 10.14 + 3.19 + 0.05 = \mathbf{13.33\ ft}$$

where: BWL = Bottom Water Level (ft)
Vd = Depth of Chemical Sludge for Phosporus precipitation (ft)

Top Water Level

$$TWL = BWL + DD = 13.33 + 1.67 = \mathbf{15.00\ ft}$$

where: TWL = Top Water Level (ft)

Hydraulic Retention Time

$$HRT = \frac{BA \times MAFD \times 7.48}{QT}$$

where: HRT = Hydraulic Retention Time (days)
MAFD = Maximum Average Flow Depth (ft)
QT = Fill Rate at Average Dry Weather Flow (gal/day)

$$MAFD = \frac{Q \times [(NCT \times 60) - NDT]}{BA \times 1{,}440 \times 7.48} + BWL = \frac{170{,}000 \times [(4.0 \times 60) - 60.0]}{2{,}550 \times 1{,}440 \times 7.48} + 13.33 = \mathbf{14.44\ ft}$$

$$HRT = \frac{2{,}550 \times 14.44 \times 7.48}{170{,}000} = \mathbf{1.62\ days}$$

MLSS Concentration at Bottom Water Level

$$MLSS = \frac{Mbio \times 1{,}000{,}000}{BWL \times BA \times 62.42} = \frac{10{,}778 \times 1{,}000{,}000}{13.33 \times 2{,}550 \times 62.42} = \mathbf{5{,}080\ mg/l}$$

where: MLSS = Mixed Liquor Suspended Solids concentration at Bottom Water Level (mg/l)
62.42/1E+06 = Conversion (lb/mg x l/ft³)
CA = Area Increment due to chemical sludge (ft²/basin)

Mass of Sludge Produced

$$\Delta M = \left(\frac{Y \times (BOD_{in} - BOD_{out})}{1 + (B \times \theta^{(T-20)} \times SRT)} + Zio + Zno \right) \times \frac{Q \times 8.34}{1{,}000{,}000} + Csludge$$

$$\Delta M = \left(\frac{0.6 \times (300 - 10.0)}{1 + (0.07 \times 1.02^{(6-20)} \times 32.0)} + 50.0 + 75.0 \right) \times \frac{1.7E{+}05 \times 8.34}{1{,}000{,}000} + 51 = \mathbf{323\ lb/day/basin}$$

(Lawrence-McCarty Equation as presented in WEF MOP/8 4th Edition, pg 11-11, Eqn. 11.7)

where: ΔM = Mass of Sludge Produced (lb/day/basin)
Y = Volatile cell yield (VSS/BOD removed)
q = Arrhenius Temperature Correction Factor
B = Decay Rate (day^{-1})
BOD_{out} = Anticipated Effluent BOD (mg/l)
SRT = Solids Retention Time (days)
Zio = Nonvolatile Influent suspended solids (mg/l)
Zno = Volatile Non-Biodegradable solids (mg/l)
T = Minimum Wastewater Temperature (°C)

Volume of Sludge Produced

$$V_{ws} = \frac{\Delta M}{SFws \times 8.34} = \frac{323}{0.0085 \times 8.34} = \mathbf{4{,}555\ gal/day/basin}$$

where: Vws = Volume of Waste Sludge (gal/day/basin)
SFws = Solids Fraction in Waste Sludge
8.34 = Density (lb/gal)

Observed Yield Factor

$$Yobs = \frac{\Delta M}{BOD_L} = \frac{323}{425} = \mathbf{0.759}\ \frac{\mathbf{MLSS}}{\mathbf{BOD}}$$

Observed Yield Factor (lb/day MLSS/lb/day BODremoved)

Mean Cell Residence Time

$$MCRT = \frac{Mbio}{\Delta M + ((Q - Vws) \times TESS \times 8.34 / 1E{+}06)}$$

$$MCRT = \frac{10{,}778}{323 + ((170{,}000 - 4{,}555) \times 10.0 \times 8.34 / 1{,}000{,}000)} = \mathbf{32.0\ days}$$

where: MCRT = Mean Cell Residence Time (days)
TESS = Anticipated Effluent Total Suspended Solids (mg/l)
8.34E-06 = Conversion (lb/mg x l/gal)

Sludge Age for Nitrification

Refer to Metcalf and Eddy, Edition IV pages 614 and 705

Constants and Temperature Corrections:

Coefficient	Base Value	Theta	Temperature Corrected	Symbol
Maximum Specific Growth Rate of Nitrifying bacteria, g VSS/g VSS.day	0.75	1.07	0.291	$\mu_{nm}(T)$
Half-Velocity constant for nitrifiers	0.74	1.053	0.359	Kn(T)
Nitrifier decay rate	0.08	1.04	0.046	Kdn(T)
Dissolved Oxygen, mg/l	2		2	DO
Half-Velocity Constant for Dissolved Oxygen, mg/l	0.5		0.5	Ko
Minimum Water Temperature, °C	6		6	T
Safety Factor	2.0		2.0	SF

Calculations:

$$\mu_n = \left(\mu_{nm}(T) \times \frac{TENH_3}{TENH_3 + Kn(T)} \times \frac{DO}{DO + Ko} \right) - Kdn(T)$$

$$\mu_n = \left(0.291 \times \frac{1.0}{1.0 + 0.359} \times \frac{2.0}{2.0 + 0.5} \right) - 0.046 = \mathbf{0.125\ days^{-1}}$$

$$SRTmin = \frac{1}{\mu_n} = \frac{1}{0.125} = \mathbf{8.0\ days}$$

$$SRTaerobic = SRTmin \times SF = 8.0 \times 2.0 = \mathbf{16.0\ days}$$

$$SRToverall = \frac{SRTaerobic \times 24}{TA} = \frac{16.0 \times 24}{12.0} = \mathbf{32.0\ days}$$

Design sludge age adequate for nitrification.

where: μnm(T) = Maximum Temperature Corrected Nitrifier Growth Rate ($days^{-1}$)

μ_n = Specific Nitrifier Growth Rate at Temperature, DO, and Effluent NH_3 (g/g-days)

SRTmin = Minimum Sludge age required for Nitrification (days)

SRTaerobic = Design Aerobic Sludge Age (days)

SF = Safety Factor

SRToverall = Sludge Age accounting for entire ICEAS cycle (days)

TA = Aeration Time (hrs/day)

$TENH_3$ = Anticipated Effluent Ammonia (mg/l)

Waste Sludge Pump Capacity

$$WSP = \frac{Vws \times NCT}{24 \times SPT} = \frac{4{,}555 \times 4.0}{24 \times 6.90} = \mathbf{110\ gal/min}$$

where: WSP = Waste Sludge Pump Capacity(gal/min)
SPT = Sludge Pumping Time (min/cycle)

Biological Phosphorus Removal

$$TPb = TPi - TPe - [Yobs \times (BODin - BODout)] \times TPps \times VSS/TSS = 4.0 - 0.80 - [0.759 \times (300 - 10.0) \times 0.000 \times 0.622] = \mathbf{3.20\ mg/l}$$

where: TPb = Concentration of the Soluble Phosphorus to be removed (mg/l)
TPi = Concentration of the Total Phosphorus in the Influent (mg/l)
TPps = Percent of Total Phosphorus in VSS in WAS

Chemical Dosing

$$CD = MolR \times TPb \div Ion \times MWRatio$$

where: CD= Required Ferric Chloride dosing rate, mg/l
MolR= Mole Ratio (Actual Dose required vs. Stoichiometric Dose)
Ion= Fraction Metal Ion in Ferric Chloride
MWRatio= Ratio of Molecular Weights, Fe:P

Mole Ratio for Metal Salt Dosage Based on effluent Phosphorus concentration.
Mole ratio based on curves in Activated Sludge and Nutrient Removal, WEF OM-9, 3rd edition, 2018

$$CD = 2.51 \times 3.20 \div 0.348 \times 1.81 = \mathbf{42\ mg/l}$$

Mass of Chemical Sludge

$$Csludge = \frac{Q \times TPb \times 11.25 \times 8.34}{1{,}000{,}000} = \frac{170{,}000 \times 3.20 \times 11.25 \times 8.34}{1{,}000{,}000} = \mathbf{51\ lb/day/basin}$$

where: 11.25= Mass of Precipitate formed per Mass of P removed

Volume of Chemical Sludge

$$Vcs = Csludge \times SVI \times SA = 51 \times 2.4 \times 32.0 = \mathbf{3{,}936\ ft^3/basin}$$

where: Vcs = Volume of Chemical Sludge (ft^3/basin)

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SANITAIRE ICEAS Aeration Design Calculations
BOD Removal and Nitrification Process

SANITAIRE Project #a29193-18
Stamp, NY

Carbonaceous Oxygen Demand

$$AOR1 = A \times \frac{Q \times BODin}{1{,}000{,}000} \times 8.34 = 1.20 \times \frac{170{,}000 \times 300}{1{,}000{,}000} \times 8.34 = \textbf{510 lb/day/basin}$$

where AOR1 = Actual Oxygen Required for BOD oxidation (lb/day/basin)
A = O2 / BOD
Q = Average flow (gal/day/basin)
BODin = Influent BOD received (mg/l)
1,000,000 = Conversion (g x mg)
8.34 = Conversion (lb x gal)

Nitrification Oxygen Demand

$$AOR2 = TKNox \times 4.60 = 61.3 \times 4.60 = \textbf{282 lb/day/basin}$$

where AOR2 = Actual Oxygen required for Ammonia Oxidation (lb/day/basin)
TKNox = Nitrogen available for oxidation(lb/day/basin)

Constants

Coefficient	Value	Symbol
VSS/TSS	0.6222	
Sludge N	0.1	Ns
Effluent Dissolved Organic Nitrogen, mg/l	1	EDON
Expected Effluent Ammonium concentration	1	$TENH_3$

$$TKN_{ox} = (TKN - EDON - TENH_3 - N_{assim} - N_{part}) \times Q \times 8.34 \div 1{,}000{,}000$$

$$TKN_{ox} = (60 - 1 - 1 - 14.17 - 0.62) \times 170{,}000 \times 8.34 \div 1{,}000{,}000 = \textbf{61.3 lb/day/basin}$$

where N_{assim} = Nitrogen assimilated into biomass, (mg/l)

$$N_{assim} = BOD_{in} \times N_s \times Y_{obs} = 300 \times 0.1 \times 0.759 = \textbf{14.17 mg/l}$$

where Y_{obs} = Observed Sludge Yield, (MLSS produced / BOD removed)

$$N_{part} = TESS \times N_S \times VSS/TSS = 10 \times 0.1 \times 0.62 = \textbf{0.62 mg/l}$$

where N_{part} = Nitrogen bound to VSS portion of effluent TSS (mg/l)
TESS = Anticipated Effluent Total Suspended Solids (mg/l)

Denitrification Oxygen Credit

$$O_{2denit} = 2.9 \times NO3\text{-}Ndenit = 2.9 \times 42 = \mathbf{122\ lb/day/basin}$$

where O_{2denit} = Oxygen mass credit from denitrification (lb/day/basin)

NO3-Ndenit = Mass of NO3-N denitrified (lb/day/basin)

$$NO_3\text{-}N_{denit} = \mu_{DN} \times VSS/TSS \times BMOB \times ART = 0.00075 \times 0.62 \times 10{,}778 \times 8.31 = \mathbf{42\ lb/day/basin}$$

where μ_{DN} = Denitrification rate at 6°C (NO3/MLVSS/hr)

BMOB = Basin biomass (lb/basin)

ART = Anoxic Retention Time, (hrs/day)

Total Actual Oxygen Transfer

$$AOR = AOR1 + AOR2 - O_{2denit} = 510 + 282 - 122 = \mathbf{671\ lb/day/basin}$$

where AOR = Total Actual Oxygen Required (lb/day/basin)

Total Standard Oxygen Transfer

$$SOR = \frac{AOR}{AOR / SOR} = \frac{671}{0.4820} = \mathbf{1{,}393\ lb/day/basin}$$

$$\frac{AOR}{SOR} = \frac{\alpha \times \theta^{(TSite - 20)} \times (\beta \times C^{*}sat_{20} \times Psite / Pstd \times Csurf_T / Csurf_{20} - D.O.)}{C^{*}sat_{20}}$$

$$\frac{AOR}{SOR} = \frac{0.65 \times 1.024^{(20 - 20)} \times (0.95 \times 10.37 \times 14.46 / 14.70 \times 9.07 / 9.07 - 2.0)}{10.37} = \mathbf{0.4820}$$

where SOR = Standard Condition Oxygen Requirement (lb/day/basin)

α = Alpha factor

θ = Temperature coefficient

Tsite = Water temperature (°C)

β = Beta factor

Psite = Site Atmospheric Pressure

Pstd = Standard atmospheric pressure (psig)

$C^{*}sat_{20}$ = Dissolved oxygen solubility at standard conditions (mg/l)

$Csurf_T$ = Dissolved oxygen solubility at site water temperature (mg/l)

$Csurf_{20}$ = Dissolved oxygen solubility at 20°C (mg/l)

D.O. = Residual dissolved oxygen concentration (mg/l)

Aeration System Standard Oxygen Transfer Rate

$$SOTR = \frac{SOR}{TA} = \frac{1{,}393}{12} = \mathbf{116\ lb/hr/basin}$$

where SOTR = Standard oxygen transfer rate (lb/hr/basin)
TA = Aeration Time, (hrs/day)

Aeration Depth

Average Aeration Depth

$$AADad = \frac{Q \times [(NCT \times 60) - (NDT + NST)]}{2 \times 1{,}440 \times 7.48 \times BA} + BWL$$

$$AADad = \frac{170{,}000 \times [(4.0 \times 60) - (60 + 60)]}{2 \times 1{,}440 \times 7.48 \times 2{,}550} + 13.33 = \mathbf{13.70\ ft}$$

where AADad = Average Aeration Depth at Average Dry Weather Flow (gpd)
Q = Average Dry Weather Flow (gpd/basin)
NCT = Normal Cycle Time (hr)
NDT = Normal Decant Time (min)
NST = Normal Settling Time (min)
BA = Basin Area (ft^2)
1440 = Conversion (min/day)
2 = Calculate Aeration Depth at Middle of Normal Reaction Phase (NCT - NST - NDT)
7.48 = Conversion (gal/ft^3)

Maximum Aeration Depth

$$MADpw = \frac{PWWF \times [(SCT \times 60) - (SDT + SST)]}{1{,}440 \times 7.48 \times BA} + BWL$$

$$MADpw = \frac{340{,}000 \times [(3.0 \times 60) - (45 + 45)]}{1{,}440 \times 7.48 \times 2{,}550} + 13.33 = \mathbf{14.44\ ft}$$

where MADpw = Maximum Aeration Depth at Peak Wet Weather Flow (gpd)
PWWF Peak Wet Weather Flow (gpd/basin)
SCT = Storm Cycle Time (hr)
SDT = Storm Decant Time (min)
SST = Storm Settle time (min)
MAD = Maximum Aeration Depth (ft)

MAD is larger of MADad and MADpw

MAD = **14.44 ft**

Air Flow Requirement

$$\text{Process Air} = \frac{SOTR \times 10{,}000}{\rho \times SOTE \times Opw \times 60} = \frac{116 \times 10{,}000}{0.075 \times 25.59 \times 23.2 \times 60} = \mathbf{434\ scfm}$$

where Process Air = Process air flow requirement (scfm)
ρ = Air density (0.075 lb/day/ft³)
SOTE = Standard Oxygen Transfer Efficiency @ Submergence of 12.70 ft
Opw = Fraction of Oxygen in air by Weight
10,000 = Conversion (100% * 100%)
60 = Conversion (min/hr)

Mixing Air = MI x BA = 0.13 x 2,550 = **319 scfm**

where Mixing Air = Mixing air flow requirement (scfm)
MI = recommended air flow per unit area of basin (scfm/ft²)

Blower Unit Capacity

Blower unit capacity (BUC) is the larger of the process air requirement and the mixing air requirement.

Process Air	434	scfm
Mixing Air	319	scfm

Use 1 blower per tank

BUC = **440 scfm**

Blower Pressure

psig = MAD x 0.432 + H_L = 14.44 x 0.432 + 1.00 = **7.3 psig**

where psig = blower pressure (rounded to next psig)
0.432 = water density (psi/ft)
H_L = Cumulative piping and diffuser headloss (psig)

Average Blower Power

Blower power based on vendor curves, BUC, and Average Aeration Depth (12.70 ft)

$Power_{avg}$ = **22.6 bhp**

Disc Filter Sizing and Equipment Selection

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1. Design Summary and Scope of Supply

Kruger is pleased to propose the Hydrotech Discfilter system for this project. The system design is based on the information listed in the following tables and will be supplied according to Kruger design standards:

Design Criteria

Design Parameters		
Influent Source	Effluent from SBR	
Peak Hour Flow Phase 2	1.36 (944)	MGD (gpm)
Peak Hour Flow Phase 1	0.20 (139)	MGD (gpm)
Peak Influent TSS	20	mg/L
Average Influent TSS	15	mg/L
[1]Monthly Average Effluent TSS	10	mg/L

1) The influent to the Filtration System must contain particles of sufficient size and strength to allow retention on the specified 10 um media surface in order for the performance criteria to be met.

Equipment Supply

Discfilter Design	**Phase 1**	**Phase 2**	
Discfilter Model Number	HSF2206/2-1C	HSF2206-1C	
Total Units (duty/standby)	1 (1/0)	1 (1/0)	
Total Filter Area Per Unit	121	362	ft^2
Submerged Filter Area Per Unit	78	235	ft^2
Disc Diameter	2.2	2.2	m
Peak Hydraulic Loading Rate	1.77	4.02	gpm/ft^2
Number of Discs Per Unit	2	6	
Media Pore Size	10	10	µm
Chassis Material	304 SS	304 SS	
Cover Material	GRP	GRP	
Self-Enclosed Tank Material	304 SS	304 SS	
SEW Drive Motor	1.5	1.5	HP
Backwash Water Pump	2	7.5	HP
Backwash Pump Rated Flow	14	41	gpm
Influent Flange	ANSI 12"	ANSI 12”	

Effluent Flange	ANSI 10"	ANSI 10”	
Mobile Automated Cleaning System	Optional	Optional	
Controls System	Allen Bradley	Allen Bradley	
Unit Control Panel Enclosure Type	NEMA 4X	NEMA 4X	
Instrumentation - Level Sensors	One (1) lot	One (1) lot	

An instrumentation and control system will be included with the Kruger equipment. The control system will be designed and supplied according to Kruger standards. It will include the following:

- NEMA4X local control panel for each Discfilter unit

Process and Design Engineering

Kruger provides process engineering and design support for the system as follows:

- Equipment specifications for equipment supplied by Kruger
- Technical instructions for operation and start-up of the system
- Equipment location drawings and installation plans
- Project specific O&M manuals

Field Services

Kruger will furnish a Service Engineer as specified at the time of start-up to inspect the installation of the completed system, place the system in initial operation, and to instruct operating personnel on the proper use of the equipment. Specifically, Kruger will provide:

- Field Service Engineer/Technician – Four (4) days on site in not more than two (2) site visits to assist with inspection check-out, start-up, optimization, and operator training.
- I&C Field Service Engineer/Technician – Four (4) days on site in not more than one (1) site visit to assist with inspection and I/O check-out, start-up, and operator training.

Installation Requirements

The following items will be installed by the Contractor/Others:

- Control panel(s)
- Interconnecting wiring and/or conduit between the supplied control panel(s) and Discfilter equipment
- Any junction or pull boxes or any other like device needed to supply the interconnecting wiring
- All field connections/terminations to the supplied control panels, the Discfilter equipment and between the Discfilter and supplied control panels
- All supports and anchoring required to install the Discfilter unit
- Plumbing/interconnecting piping, electrical connections, access platforms, grating & handrails

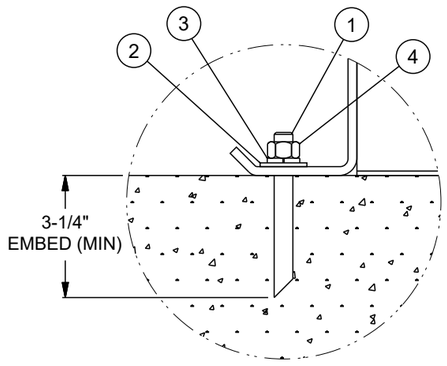
2. Pricing

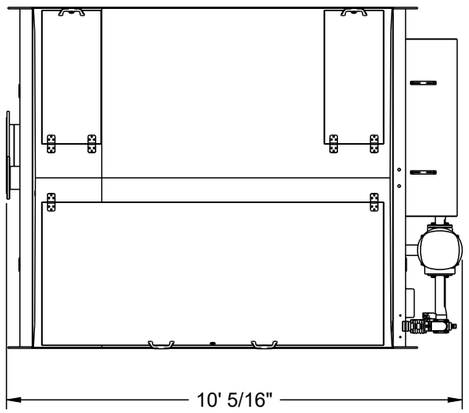
The pricing for the Discfilter system, as defined herein, including process and design engineering, field services, and equipment supply is as follows:

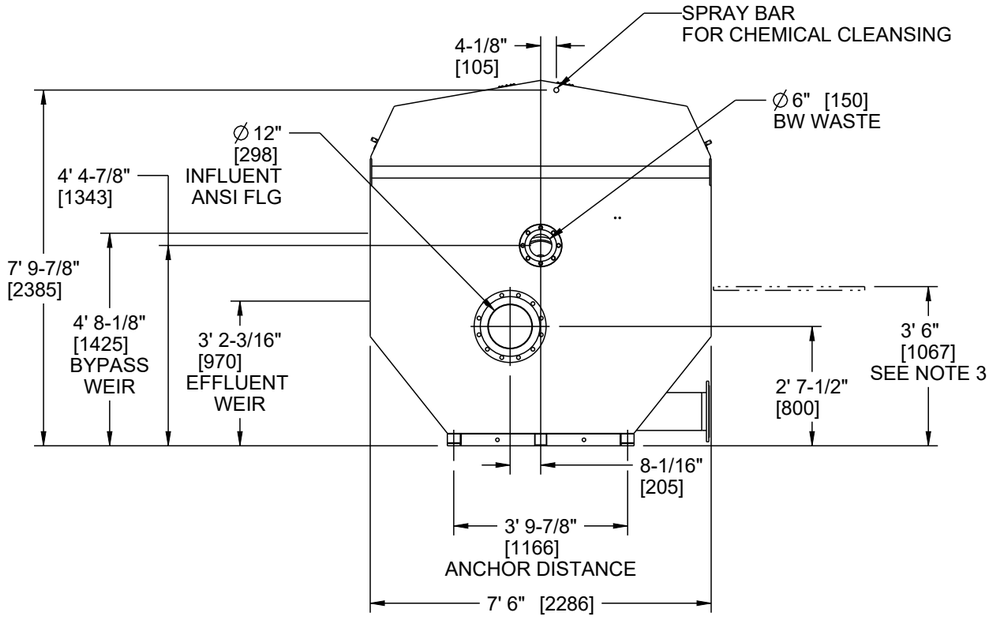
TBD

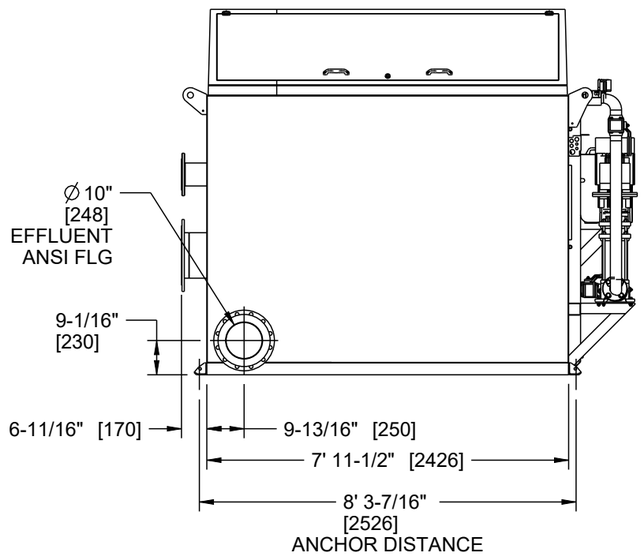
Adder for four (4) discs for Phase 2 and upgraded BW Pump: TBD

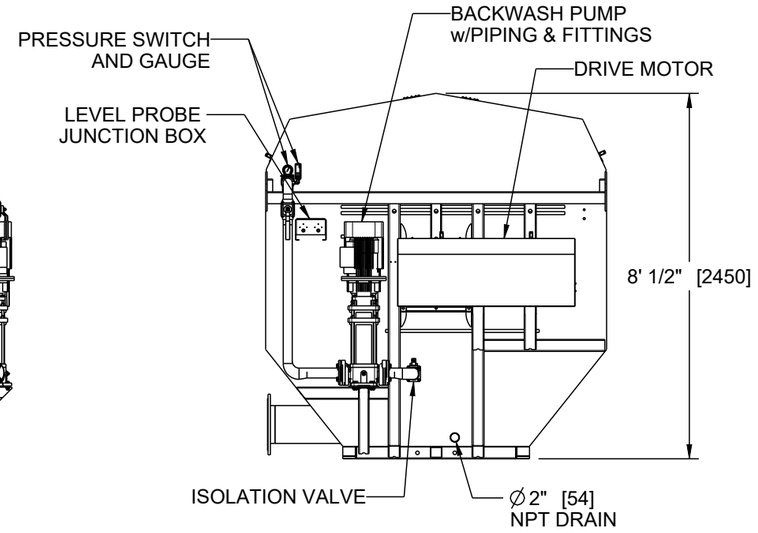
1	1/2" THREADED ROD: ASTM F593 W/ B1.1 UNC THDS
2	1/2" FLAT WASHER: ASTM A240 304 SS. PLATE
3	1/2" LOCK WASHER
4	1/2" HEX NUT: ASTM F594 W/ B1.1 UNC THREADS











NOTES :
1. ALL FLANGE CONNECTIONS:BOLT PATTERN ANSI B16.5. PLATE FLANGE: GALVANIZED, STUB END: AISI 304
2. DIMENSIONS IN [ ] ARE MM
3. RECOMMENDED PLATFORM ELEVATION. WORK PLATFORM TO BE SELF SUPPORTING. PLATFORMS MAY NOT BE ATTACHED TO THE FILTER AND LOADS MAY NOT BE TRANSFERRED TO FILTER. PLATFORMS DESIGNED/PROVIDED BY OTHERS.
4. RECOMMEND 24" MINIMUM MAINTENANCE ACCESS AROUND ENTIRE PERIMETER OF DISCFILTER.
5. FOLLOW ANCHOR MANUFACTURERS GUIDELINES FOR SPECIFIC INSTALLATION REQUIREMENTS INCLUDING ANCHOR EMBEDMENT AND EDGE DISTANCE. SEISMIC CODE REQUIREMENTS MAY AFFECT ANCHOR DETAIL SHOWN.
6. ALL ANCHORS AND FASTENERS TO BE STAINLESS STEEL. APPLY ANTI-SEIZE TO ALL CONNECTIONS.

REV	DESCRIPTION	DRAWN	APPR	DATE
B	REVISED NAME	HJH	-	11.15.18
A	PRELIMINARY RELEASE	CDP	JCC	03.29.18

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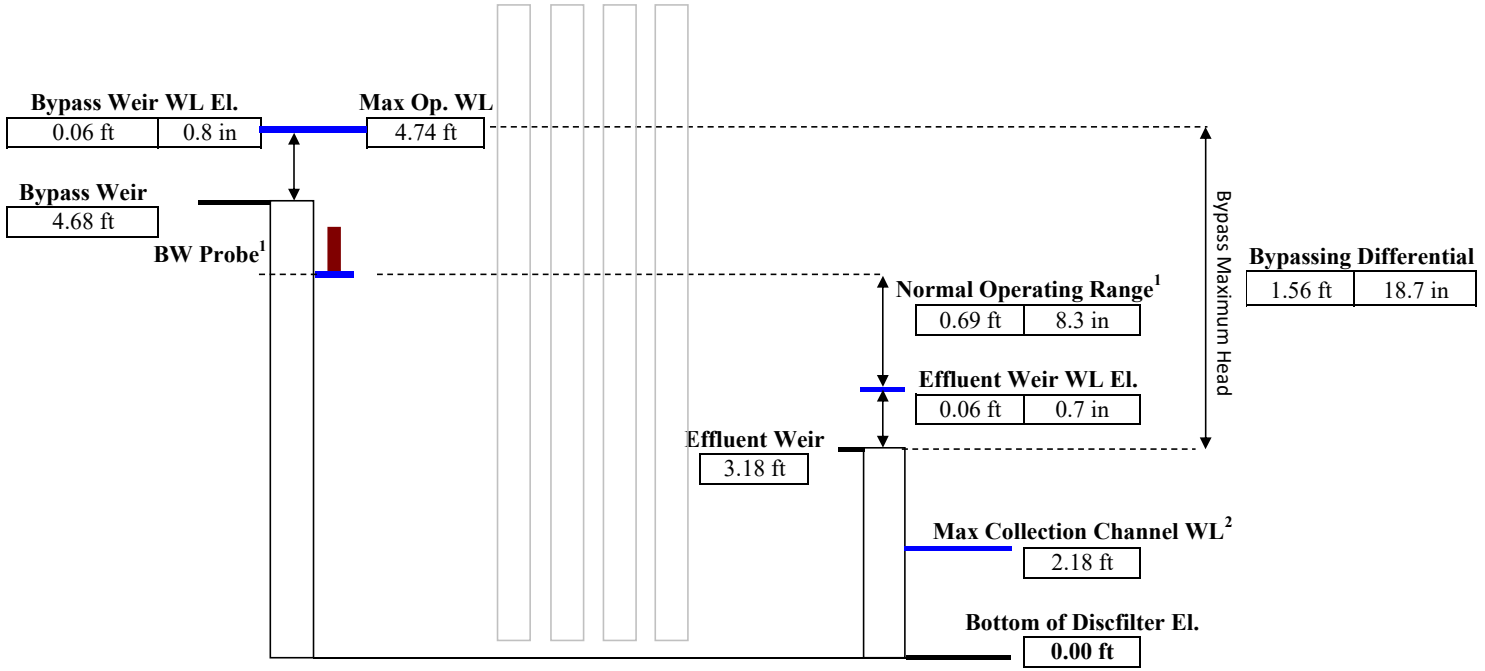
VEOLIA
KRUGER INC.
4001 WESTON PKWY CARY, NC 27513 | (919) 677-8310

DISCFILTER
HSF2206-1C, UNIT DRAWING
MIXING BYPASS

-
STANDARD PRODUCT

SCALE	DRAWING NO	SHEET	REV
1:40	1C.2206.M.12.10	1 of 1	B

Date:	5/4/2020
Project City:	Alabama
Project State:	NY
Project Number:	5700132909
Model:	HSF2206/2-1C
Total Flow:	0.20 MGD
Units in Service:	1
Flow per unit:	0.20 MGD



	mm	ft	in	elevation
Inlet Bypass Water Elevation	1,444 mm	4.74 ft	56.9 in	4.74 ft
Bypass Weir	1,425 mm	4.68 ft	56.1 in	4.68 ft
Effluent Water Elevation	988 mm	3.24 ft	38.9 in	3.24 ft
Effluent Weir	970 mm	3.18 ft	38.2 in	3.18 ft
Bottom of Unit	0 mm	0.00 ft	0.0 in	**0.00 ft**

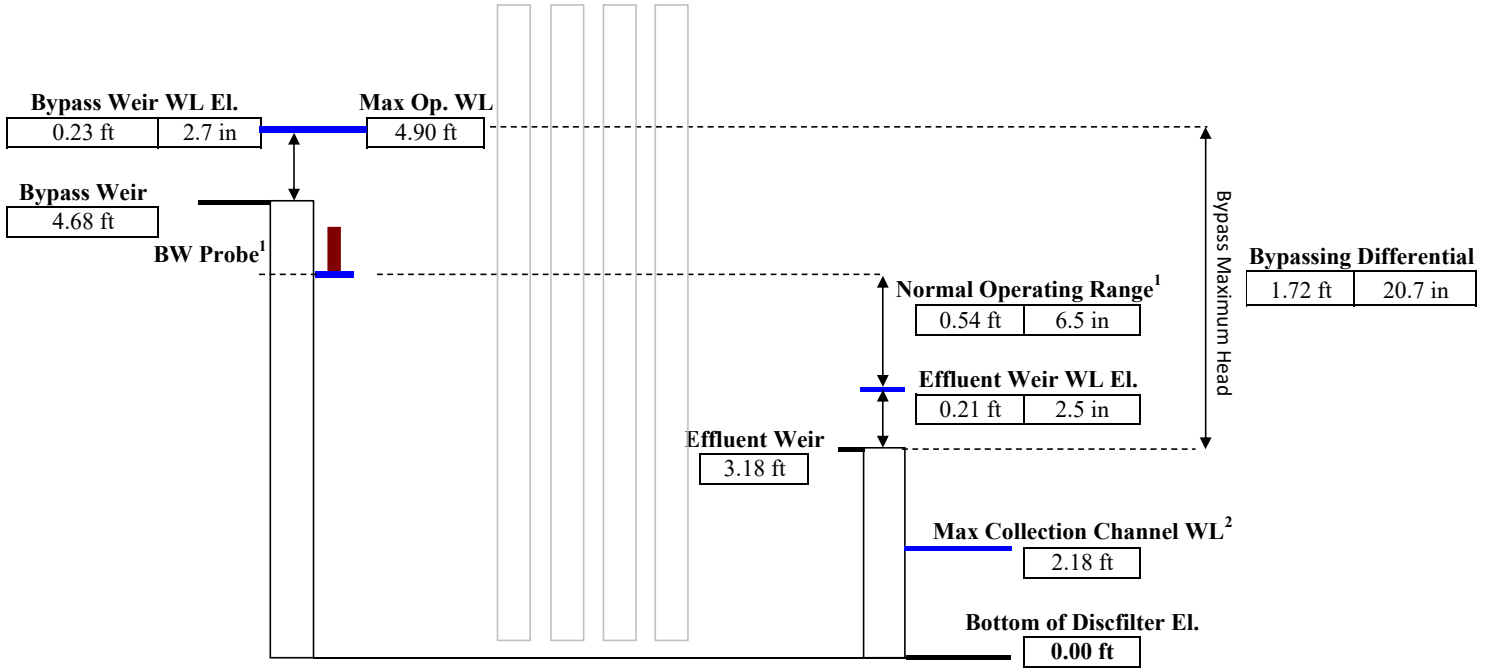
NOTE: The above diagram is indicative of hydraulic profile only and should not be interepreted as a display of treatment flow path.

[1] - The exact placement of the backwash probe is based on operating observations during installation and startup.

[2] - Please contact Kruger if downstream hydraulic conditions are such that the water level in the effluent collection channel exceeds levels indicated.

Veolia Water Technologies, Inc.
dba Kruger
4001 Weston Parkway
Cary, NC 27513
Tel: (919) 677-8310
www.veoliawatertech.com

Date:	5/4/2020
Project City:	Alabama
Project State:	NY
Project Number:	5700132909
Model:	HSF2206-1C
Total Flow:	1.36 MGD
Units in Service:	1
Flow per unit:	1.36 MGD



	mm	ft	in	elevation
Inlet Bypass Water Elevation	1,495 mm	4.90 ft	58.8 in	4.90 ft
Bypass Weir	1,425 mm	4.68 ft	56.1 in	4.68 ft
Effluent Water Elevation	1,033 mm	3.39 ft	40.7 in	3.39 ft
Effluent Weir	970 mm	3.18 ft	38.2 in	3.18 ft
Bottom of Unit	0 mm	0.00 ft	0.0 in	**0.00 ft**

NOTE: The above diagram is indicative of hydraulic profile only and should not be interepreted as a display of treatment flow path.

[1] - The exact placement of the backwash probe is based on operating observations during installation and startup.

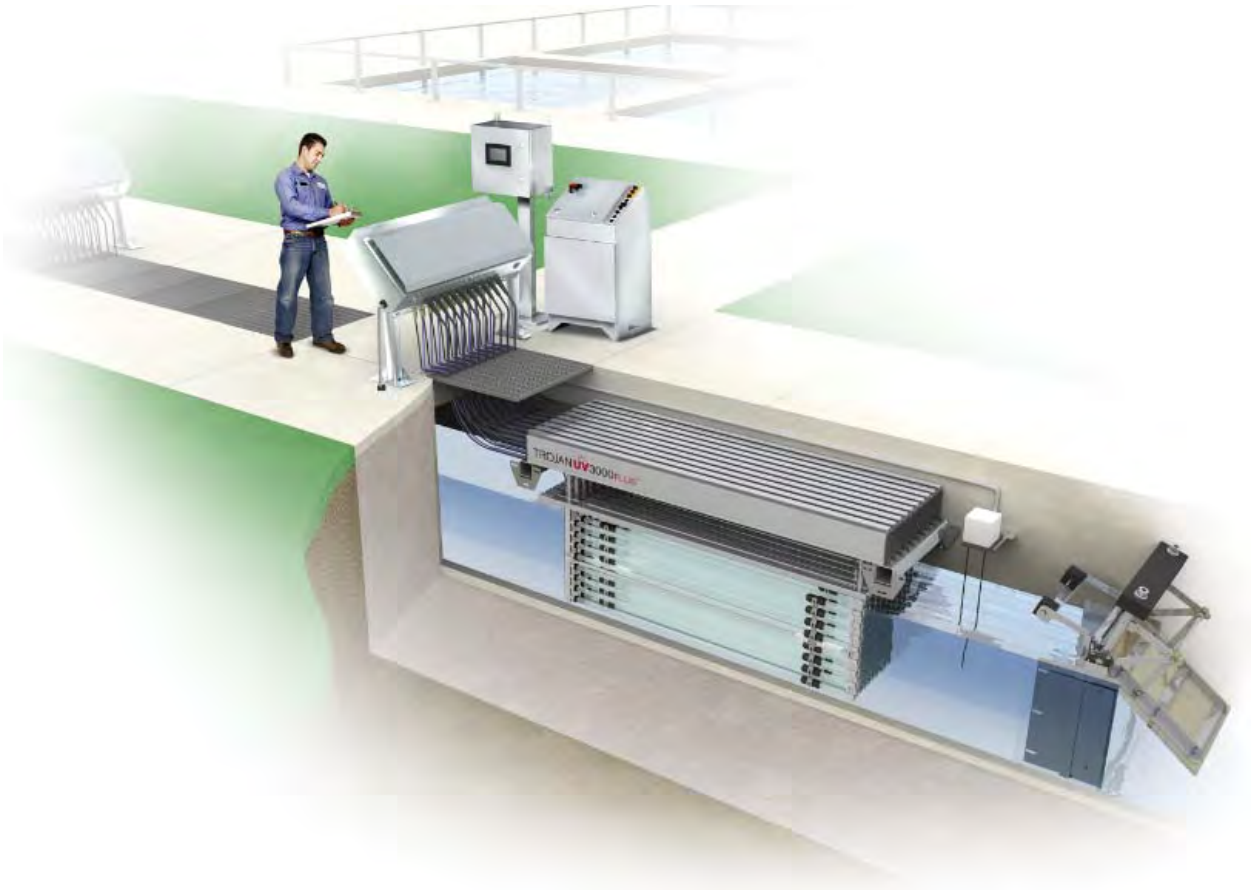
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www.veoliawatertech.com

UV Disinfection Sizing and Equipment Selection

TROJAN UV3000 PLUS™

PROPOSAL FOR STAMP - ALABAMA, NY
QUOTE: 224597
May 4, 2020



The TrojanUV3000Plus™ is operating in **over 2000** municipal wastewater plants around the world. Disinfecting **over 17 billion** gallons a day, the TrojanUV3000Plus™ has become the reference standard in the industry.

May 4, 2020

CPL
205 St Paul St.
Suite 500
Rochester, NY
14604

We are pleased to provide the following TrojanUV3000Plus™ proposal for the **STAMP – Alabama, NY** project.

The TrojanUV3000Plus™ has been shown in over 2000 installations to provide dependable performance, simplified maintenance, and superior electrical efficiency. As explained in this proposal, the system incorporates innovative features to reduce O&M costs, including variable output electronic ballasts to provide dimming capability and Trojan's revolutionary ActiClean-WW™ system – the industry's only online chemical and mechanical quartz sleeve cleaning system. All Trojan installations are supported by a global network of certified Service Representatives providing local service and support.

Please do not hesitate to call us if you have any questions regarding this proposal. Thank you for the opportunity to quote the TrojanUV3000Plus™ and we look forward to working with you on this project.

With best regards,

Fiona Crawford

3020 Gore Road
London, Ontario N5V 4T7
(519) 457 – 3400 ext. 2194
fcrawford@trojanuv.com

Local Representative:
Wayne Dodsworth
Koester Associates Inc.
(315) 697-3800
Wayned@koesterassociates.com

DESIGN CRITERIA

Peak Design Flow:	**0.17 MGD** (expandable to future 2.72 MGD)
UV Transmittance:	**65%** (minimum)
Total Suspended Solids:	**20 mg/l** (30 day Average, grab sample)
Disinfection Limit:	**200 fecal coliform per 100 ml** (30 day Geomean, grab sample)

DESIGN SUMMARY

QUOTE: 224597

Based on the above design criteria, the TrojanUV3000Plus™ proposed consists of:

CHANNEL (Please reference Trojan layout drawings for details.)	
Number of Channels:	**1**
Approximate Channel Length Required:	**30 ft**
Channel Width Based on Number of UV Modules:	**16 in (flared to 48 in at level controller)**
Channel Depth Recommended for UV Module Access:	**54 in**
Number of SST Channel Reduction Baffles:	**2**
UV MODULES	
Total Number of Banks:	**2**
Number of Modules per Bank:	**2 (expandable to 4 for future 2.72 MGD)**
Number of Lamps per Module:	**4**
Total Number of UV Lamps:	**16 (expandable to 32 for future 2.72 MGD)**
Maximum Power Draw:	**8 kW**
UV PANELS	
Power Distribution Center Quantity:	**2 (4 Module Wide PDC for Expansion)**
System Control Center Quantity:	**1 (Touch Smart Controller)**
MISCELLANEOUS EQUIPMENT	
Level Controller Quantity:	**1**
Type of Level Controller:	**Serpentine Weir (384 in effective crest length)**
Automatic Chemical / Mechanical Cleaning:	**Trojan ActiClean-WW™**
UV Module Lifting Device:	**Module Lifting Sling**
Standard Spare Parts / Safety Equipment:	**Included**
Other Equipment:	**2 - 8 in W 304SST Channel Reduction Baffles**

ELECTRICAL REQUIREMENTS	
1.	Each Power Distribution Center requires an electrical supply of one (1) 208V, 3-phase, 3-wire + GND, 60 Hz, 4.1 kVA.
2.	The Hydraulic System Center requires an electrical supply of one (1), 208V, 3-phase, 3-wire + GND, 60 Hz, 2.5 kVA.
3.	The System Control Center requires an electrical supply of one (1) 120V, 1-phase, 2-wire + GND, 60 Hz, 1.8 kVA.
4.	Electrical disconnects required per local code are not included in this proposal.

COMMERCIAL INFORMATION

Total Capital Cost:

This price excludes any taxes or duties that may be applicable.
Standard equipment warrantees and start up by Trojan-certified technicians are included.

EQUIPMENT WARRANTEES

1. Trojan Technologies warrants all components of the system (excluding UV lamps) against faulty workmanship and materials for a period of 12 months from date of start-up or 18 months after shipment, whichever comes first.

2. UV lamps purchased are warranted for 12,000 hours of operation or 3 years from shipment, whichever comes first. The warranty is pro-rated after 9,000 hours of operation. This means that if a lamp fails prior to 9,000 hours of use, a new lamp is provided at no charge.

3. Electronic ballasts are warranted for 5 years, pro-rated after 1 year.

Screw Press Sizing and Equipment Selection

354 State Route 29, Greenwich, New York 12834
Phone No 518-695-6851
E-mail: dan@bdpindustries.com

Date: Wednesday, June 5, 2019 **Page: 1 of 5**

To: Clark Patterson Lee
205 Saint Paul Street
Rochester, NY 14604

Attn: Nick Bayer
Phone: 585-324-0448
E-mail: NBayer@CPLteam.com

Re: STAMP Project
Budget Proposal: One (1) BDP 3012 Screw Press skid mounted
BDP Proposal #: 060519-0839

BDP Industries, Inc. is pleased to offer our quotation for One (1) BDP Screw Press and accessories, skid mounted. The Screw Press is designed to achieve high discharge solids with a system that is simple to operate and maintain. The screw press unit includes a pre-thickening drum, the press, a control panel, polymer system, sludge pump, filtrate recycle system, and wash water pump, all mounted on a stainless steel skid as a complete dewatering system. A discharge conveyor, separate from the skid, is also included in this proposal. Below is a summary description and scope of our proposal.

EQUIPMENT DESCRIPTION

The Screw Press equipment package includes a complete press and appurtenant equipment, skid mounted and described as follows:

1. One (1) 316L stainless steel polymer injection and polymer/sludge mixing system consisting of an injection ring, variable vortex mixer, and reducing fittings.

2. One (1) 304 stainless steel Rotary Drum Thickener with a variable speed drive motor.
    a) 304 stainless steel frame
    b) 304 stainless steel wetted parts.
    c) 304 stainless steel hardware.
    d) TEFC IP65 severe duty variable speed motors.
    e) PVVC conduit.
    f) NEMA 4X pre-wired Junction box.

3. One (1) Screw Press, 12” diameter, with the following design features:

354 State Route 29, Greenwich, New York 12834
Phone No 518-695-6851
E-mail: dan@bdpindustries.com

a.) 304 stainless steel frame.
b.) 304 stainless steel wetted parts.
c.) 304 stainless steel hardware.
d.) Replaceable wear flights.
e.) Automatic, intermittent oscillating screen shower.
f.) Filtrate recycle system.
g.) Pneumatically adjustable discharge cone.
h.) TEFC IP65 severe duty variable speed motors.
i.) PVC conduit.
j.) NEMA 4x pre-wired junction box.

4. One (1) complete electrical control panel for all Screw Press control functions, drives, and interlocks for the screw press dewatering system. The panel will include an:
   a) Allen Bradley Compact Logix PLC
   b) Allen Bradley 12” panelview plus OIT
   c) Allen Bradley 525 variable frequency drives.
   d) IEC starter.
   e) 480/3/60
   f) UL 508
   g) NEMA 4X
   h) 304 stainless steel

5. One (1) Equipment Skid constructed of 304 stainless steel with integral filtrate collection sump and grating for walk-ways. All equipment in this proposal except for the discharge conveyor will be mounted and affixed to the equipment skid and will be pre-wired and pre-plumbed at the BDP factory.

6. One (1) MXQ Progressive Cavity sludge feed pump with 5 HP TEFC drive motor capable of pumping 75 GPM at 300 RPM and 50 psi of head pressure

7. One (1) UGSI Automatic emulsion polymer blending unit with 5 GPH progressive cavity neat pump and 1,200 GPH dilution water capability.

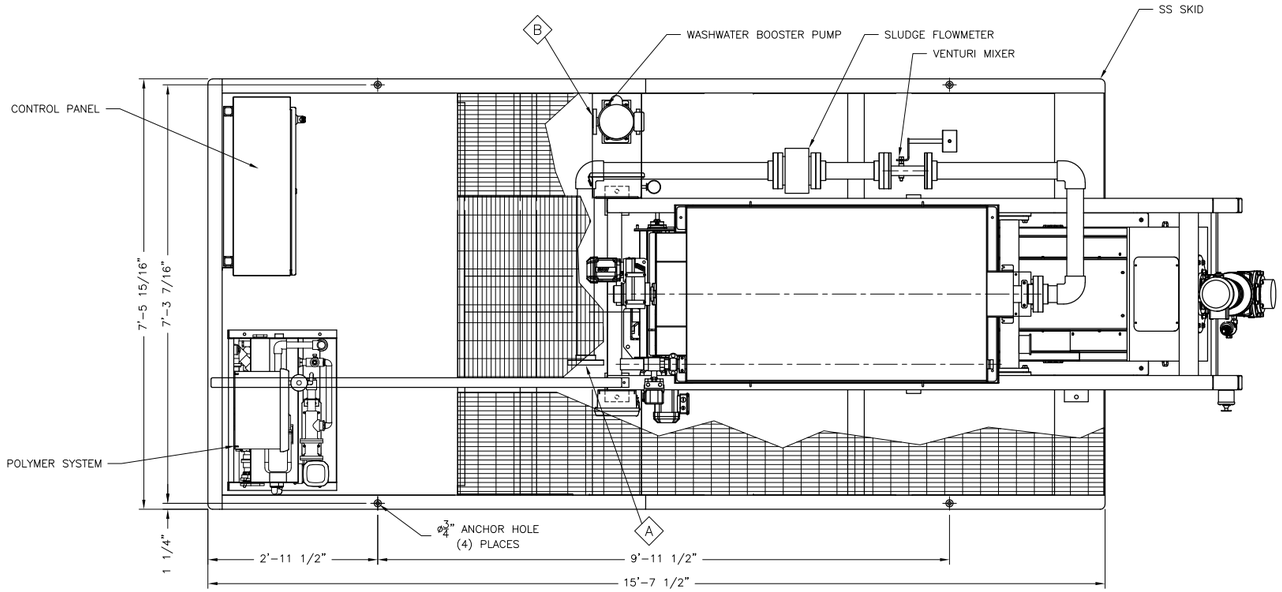
8. One (1) 3” Diameter Siemens Magnetic Flow Meter.

9. One (1) Washwater Booster Pump.

10. One (1) Filtrate Recycle System with Moyno 34401 pump.

11. One (1) Ingersoll Rand Air Compressor and Air Drier.

12. One (1) 3 HP 304 stainless steel inclined u-trough screw conveyor, 18 ft in length, capable of 110 CFH. Conveyor supports included.



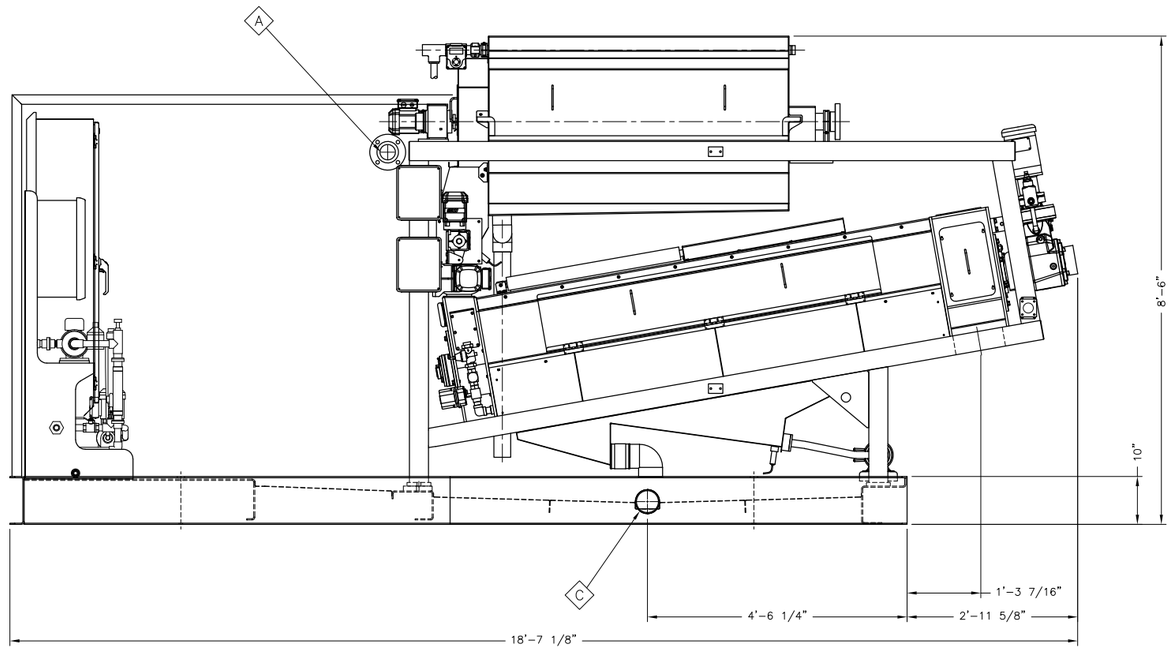
CONNECTION LEGEND:

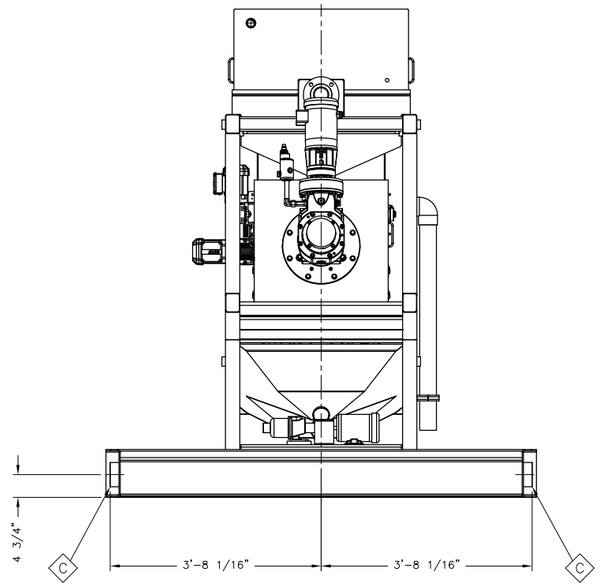
- Ⓐ 3" 150# FLANGED FEED INLET
- Ⓑ 1-1/4" 150# WASHWATER INLET
- Ⓒ (2) 4" FEMALE NPT MAIN COLLECTION PAN OUTLETS

PLUMBING BEYOND THESE POINTS NOT SUPPORTED BY BDP

APPROXIMATE WEIGHT:

- 6,500 LB. SHIPPING
- 7,500 LB. OPERATING





REV.	DESCRIPTION	BY	DATE
3	ADD SHIPPING AND OPERATING WEIGHTS	SKD	11/14/16
2	REDESIGN SKID FOR SIDE FILTRATE OUTLETS	SKD	10/4/16

QTY.	DESCRIPTION	MAT.	ITEM	REMARKS

BDP INDUSTRIES, INC.
GREENWICH, N.Y. 12834

CUSTOMER:	MACHINE:	DWG TITLE
HASTINGS. NY	SCREW PRESS	SKID MOUNTED MODEL 3012 DSP SCREW PRESS
BDP JOB NO. 1415	**DWN BY:** MJG	**DATE:** 8/18/16
APP'D BY:	**SCALE:**	**SHT.** 1 **OF** 1
DWG NO. 1-1415-2		**REV.** 3

Environmental Assessment

STAMP Offsite Sanitary & Process Wastewater Sewer Force Main

Iroquois National Wildlife Refuge
New York

July 2017

REVISED August 2018

FURTHER REVISED July 2019

FINAL May 2020

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List of Abbreviations

BBS - Breeding Bird Survey

BGEPA - Bald and Golden Eagle Protection Act

BMP - Best Management Practice

CAA - Clean Air Act

CCEP - CC Environment & Planning

CEQ - Council of Environmental Quality

CFR - Code of Federal Regulations

CWA - Clean Water Act

DOI - Department of the Interior

EA - Environmental Assessment

ESA - Endangered Species Act

FEMA - Federal Emergency Management Agency

FGEIS - Final Generic Environmental Impact Statement

FIRM - Flood Insurance Rate Maps

GCEDC - Genesee County Economic Development Center

GEIS - Generic Environmental Impact Statement

GGLDC - Genesee Gateway Local Development Center

HCP - Habitat Conservation Plan

HDD - Horizontal Directional Drilling

HDPE - High-Density Polyethylene

HP-SGCN - High-Priority Species of Greatest Conservation Need

INWR - Iroquois National Wildlife Refuge

IPCC - Intergovernmental Panel on Climate Change

ITPs - Incidental Take Permits

MBTA - Migratory Bird Treaty Act

MGD - Million Gallons Per Day

NAAQS - National Ambient Air Quality Standards

NEPA - National Environmental Policy Act

NHP - Natural Heritage Program

NLEB - Northern Long-Eared Bat

NRCC - Northeast Regional Climate Center

NWI - National Wetlands Inventory

NWP - Nationwide Permit

NYSDAM - New York State Department of Agriculture and Markets

NYSDEC - New York State Department of Environmental Conservation

NYSDOT - New York State Department of Transportation

OSHA - Occupational Safety and Health Administration

PCN - Pre-Construction Notification

PVC - Polyvinyl Chloride

SEQR - State Environmental Quality Act

SGCN - Species of Greatest Conservation Need

SGIS - Smart Growth Impact Statement

STAMP - Science & Technology Advanced Manufacturing Park

STP - Shovel Test Pit

TWMA - Tonawanda Wildlife Management Area

USACE-JD - U.S. Army Corps of Engineers Jurisdiction

USFWS - U.S. Fish and Wildlife Service

USGS - U.S. Geological Survey

WOUS - Waters of the US

WWTF - Wastewater Treatment Facility

Chapter 1 Purpose and Need for Federal Action

1.1 Introduction

This Environmental Assessment (EA) has been prepared for the U.S. Fish and Wildlife Service (USFWS) in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 USC § 4321 *et seq.*), the regulations of the Council of Environmental Quality (CEQ), 40 Code of Federal Regulations (CFR) parts 1500 through 1508, and the regulations of the Department of the Interior (DOI) 43 CFR part 46. This EA evaluates the effects of USFWS issuance to the Genesee County Industrial Development Agency d/b/a the Genesee County Economic Development Center (GCEDC) and its affiliate, the Genesee Gateway Local Development Corporation (GGLDC) of approximately 14.32 acres of new right-of-way located within the Iroquois National Wildlife Refuge (INWR) to accommodate a proposed new force main (Force Main) for sanitary and process wastewater to extend from the proposed Western New York Science & Technology Advanced Manufacturing Park (STAMP) site (Site) to a discharge location at Oak Orchard Creek on Highway 63, approximately 4.8 miles north of the Hamlet of Alabama.

1.2 Purpose and Need for the Federal Action

The GCEDC and the GGLDC have been working for the last decade on the development of the Western New York STAMP project. The Site is planned as an advanced manufacturing campus on approximately 1,262 acres of land in the Town of Alabama, New York, located along the west side of New York State Highway 77/63 (north of Judge Road), approximately five miles north of the I-90/New York State Thruway (STAMP Site).

The purpose of the proposed federal action (issuance of right-of-way within an existing road right-of-way from the INWR) is to allow for the transport of up to 6 million gallons per day (MGD) of combined sanitary and process wastewater effluent generated, recycled, and treated at the Site to the proposed discharge location at Oak Orchard Creek. The proposed action is needed to accommodate discharge of treated sanitary effluent and treated industrial process wastewater generated at the Site. Design details for the proposed action are provided in the Engineering Report in Appendix A. The treated sanitary and industrial process wastewater is referred to as "effluent" throughout the remainder of this document. All proposed disturbances described and analyzed in this document are limited to the staging areas shown on the plan sheets in Appendix A. Other construction related activities including parking of vehicles and staging of equipment and/or materials will only take place on existing hard surfaces such as along public roadways or on existing driveways and parking areas.

1.3 Project Area

The project area for the Force Main begins at the Site in the Town of Alabama in Genesee County and ends at Oak Orchard Creek in Orleans County, approximately 4.8 miles north of the Hamlet of Alabama

on Highway 63. As discussed in the following chapter, two alternative Force Main routes are evaluated in this EA. Both routes follow existing roadways and are located largely within existing roadway rights-of-way.

The INWR, located within the project area, is managed by the USFWS for the purpose of providing an inviolate sanctuary for migratory birds. The INWR is approximately 10,828 acres in size. Containing the Oak Orchard Swamp, with over 6,000 acres in wetlands, the INWR serves as a nesting, feeding, resting, and staging area for migratory waterfowl. The INWR is also home to more than 3,000 acres of bottomland hardwood and 1,800 acres of grasslands and shrublands; its habitats support approximately 260 species of birds, 42 species of mammals, and reptiles, fish, amphibians and insects. NYS Route 63 bisects the INWR in the north/south direction.

Also, located within the project area is the Tonawanda Wildlife Management Area (TWMA). The TWMA is approximately 3,100 acres in size and is owned by the State of New York and managed by the New York State Department of Environmental Conservation (NYSDEC) for the purposes of wildlife management, wildlife habitat management, and wildlife-dependent recreation. It is located in the Tonawanda Creek floodplain southwest of the Oak Orchard Swamp – southwest of and contiguous to the INWR, separated from the INWR by Lewiston Road. The TWMA, together with the INWR and the Oak Orchard Wildlife Management Area – which is located east of and contiguous to the INWR, separated from the INWR by Knowlesville Road – provide a cumulative 19,000-acre complex of State and Federal wetlands, streams, fields, and forests.

The project area of interest in this EA can be more narrowly defined to encompass a total of approximately 14.32 acres within the INWR, located on the west side of NYS Route 63. This area is the focus of the proposed federal action; issuance of right-of-way from the USFWS would be required to construct the Force Main along the Applicant Preferred Route (Alternative B). In addition, a second area approximately 15.70 acres located within the TWMA, along the south side of Lewiston Road and west side of Salt Works Road, is evaluated; as discussed in the following chapters, issuance of new right-of-way from the TWMA would be required for the No Action Alternative (Alternative A). Alternate A is immediately contiguous to the INWR but would not require any federal action because it would be located on the opposite side of the road from the southern and western boundaries of the INWR. Figures 1 through 7 are located at the end of this document and provide additional detail and illustrations about the project area of interest.

Please see Figure 1, Project Area.

Chapter 2 Alternatives

2.1 Introduction

This chapter provides information on the development and evaluation of project alternatives. Two alternatives – the No Action Alternative (Alternative A) and the Applicant Preferred Action Alternative (Alternative B) – are evaluated in detail here and in Appendix B where features common to both alternatives are described. Additional project alternatives that were considered but have been eliminated from further study are also discussed here for context.

2.2 Alternatives or Actions Considered but Eliminated from Further Study

2.2.1 Alternative Evaluated in FGEIS for STAMP Project (January 2012)

As mentioned previously, the proposed action being evaluated in this EA involves installation of a Force Main within the INWR along NYS Route 63 to transport effluent generated at STAMP.

The GCEDC, as lead agency pursuant to the State Environmental Quality Act (SEQR), prepared a Generic Environmental Impact Statement (GEIS) and a Smart Growth Impact Statement (SGIS), which analyzed the potential impacts of the STAMP project pursuant to the requirements of SEQR and the State Smart Growth Public Information Policy Act. In January 2012, the Final GEIS (FGEIS) for STAMP was accepted as complete. The FGEIS identified alternatives for wastewater treatment for STAMP and assumed a maximum of 3 MGD of sanitary discharge would be needed. The preferred treatment alternative at that time included an on-Site Wastewater Treatment Facility (WWTF) with discharge to Oak Orchard Creek, Whitney Creek or Tonawanda Creek. The Tonawanda Seneca Nation had concerns with discharging to Whitney Creek with flows into Tonawanda Creek because the creek flows through the Reservation and is an essential part of the Nation's way of life and cultural heritage. Another concern regarding an on-Site WWTF as expressed by NYSDEC was the impact of WWTF discharges to Whitney Creek on the hydrology of the Tonawanda Wildlife Management Area. Based on feedback received during the GEIS process, several meetings with the neighboring Tonawanda Seneca Nation, and changes in the development focus of the STAMP Site to focus on the semiconductor industry, new alternatives for treatment of wastewater were developed.

In 2011 a report outlining potential options for providing sanitary sewer treatment to the STAMP site was prepared. At that time, the initial sanitary flows were expected to be 1.0 MGD (million gallons per day) with a future expansion up to 3.0 MGD. The Report considered six (6) separate alternatives for treatment. The treatment method and locations considered were as follows:

1. Onsite WWTF (wastewater treatment facility) and a discharge of treated effluent to Tonawanda Creek, west of Indian Falls along NYS Route 77

2. Onsite WWTF and a discharge of treated effluent to Tonawanda Creek, along Judge Road
3. Regional WWTF with a discharge to Tonawanda Creek in Indian Falls
4. Onsite WWTF and a discharge of treated effluent to Dry Brook, a tributary of Oak Orchard Creek, near Village of Oakfield
5. Onsite WWTF and a discharge of treated effluent to Oak Orchard Creek, north of INWR
6. Onsite WWTF and a discharge of treated effluent to Whitney Creek, along Crosby Road

At that time, the recommended alternative was an onsite WWTF with a discharge to Whitney Creek, a regulated intermittent stream. This was the least expensive option and shortest route. The potential downstream impacts to Whitney Creek were noted as something that needed to be further evaluated. Based on initial discussions with the NYSDEC, a discharge to Whitney Creek was potentially feasible based on volume and concentration levels for a regulated intermittent stream.

Through meetings and discussions from 2011 to 2013, the Tonawanda Seneca Nation (TSN) expressed significant concerns over discharging to Whitney Creek, upstream of their lands. They indicated that such a discharge would endanger their lifestyle and culture and impact their ecosystem. In addition, after further analysis, the NYSDEC expressed concerns over discharging upstream of the Tonawanda Wildlife Management Area (TWMA).

In 2013, the projected total volume of combined wastewater from the STAMP site increased from 3 MGD to 12 MGD (11 MGD of process water + 1 MGD of sanitary). A Report completed by CH2MHill reviewed new alternative sanitary sewer treatment options and discharge locations. Based on the investigation, the recommended discharge location for the sanitary flows was the Village of Medina collection system. This new alternative did not involve an onsite WWTF at the STAMP site but rather involved pumping the raw sanitary waste to the Village of Medina's existing WWTF. The process wastewater was expected to be treated onsite and pumped to Lake Ontario. Whitney Creek was eliminated from consideration due to the lack of endorsement from the TSN and NYSDEC.

In 2017, the memorandum of understanding (MOU) with the Village of Medina expired and there was a lack of interest in entering into a new MOU. In addition, the total projected volume of combined wastewater decreased from 12 MGD to 6 MGD, primarily through onsite recycling of the process water. This created new potential treatment options and discharge locations. Whitney Creek was not considered as a potential discharge point because of the previous lack of endorsement from the TSN and NYSDEC even at the lower flows. The focus for potential discharge turned to Oak Orchard Creek as the current proposed receiving waters for treated discharge.

2.2.2 Alternatives Evaluated in Conceptual Water and Wastewater Alternatives Analysis and Recommendations Report (August 2013)

In August of 2013, a Conceptual Water and Wastewater Alternatives Analysis and Recommendations Report prepared for the STAMP project identified potential sanitary sewage conveyance and treatment options for the STAMP Site. Five potential scenarios were identified, assessed, and eliminated, including:

- Construct an on-Site treatment facility and discharge via pipeline to an off-Site location beyond the local area;
- Pump the wastewater to the City of Lockport WWTP;
- Construct an on-Site wastewater treatment facility to discharge to a local receiving water;
- Construct an on-Site treatment facility with deep-well injection of effluent;
- Manage wastewater through reuse alternatives.

Three additional alternatives were evaluated, including:

- Transport and off-Site wastewater treatment at the Bird Island Wastewater Treatment Facility in Buffalo
- Transport and off-Site wastewater treatment at the Van Lare Wastewater Treatment Facility in Rochester
- Transport and off-Site wastewater treatment at the Village of Medina Wastewater Treatment Facility

All three of these alternatives were determined to be technically viable. Based on this report, the Medina WWTF was selected as the preferred effluent alternative.

2.2.3 Alternatives Evaluated in Force Main Route Analysis Report (February 2016)

In February 2016, a force main route analysis was completed to evaluate route alternatives for conveyance of sanitary sewage from the Site to the Medina collection system. All of the alternatives analyzed included an on-Site pump station located within the designated utility area, approximately in the center of the Site. Four alternatives were considered in the analysis. Three of these alternatives shared a route from the Site through the INWR; they differed in the routing to reach the Medina WWTF on the northern end of the project limits. The fourth alternative followed Lewiston Road to Salt Works Road (traversing the western border of the INWR and the eastern border of TWMA). Profiles and a geological review were completed for each alternative route, and based on existing topography, existing bedrock, and existing wetlands and streams, it was determined that all alternatives were feasible with regard to construction.

Two alternatives have been carried forward for evaluation in this EA. (Three of the four alternatives evaluated in the route analysis report require the exact same new right-of-way through the INWR and are therefore included as a single alternative in this EA). These include the No Action Alternative (which

follows Lewiston Road to Salt Works Road and would require new right-of-way from the TWMA) and the Applicant Preferred Alternative (which follows NYS Route 63 through the INWR).

2.3 Alternative A (No Action) – No issuance of ROW from INWR

Alternative A (No Action) contemplates a scenario that would require no need for permits from the USFWS because the Force Main would be on the opposite side of the road from the INWR and therefore would not physically be within the INWR. Alternative A (No Action) evaluates the installation of the Force Main in areas within the TWMA (across the road from the western boundary of the INWR) and would include installation of approximately 49,000 linear feet of 18" polyvinyl chloride (PVC) and 20" high-density polyethylene (HDPE) sanitary Force Main, main line valves, maintenance manholes, metering manholes, Force Main markers, and a pump station. The Force Main would convey effluent from the Main Sanitary Pump Station located at the utility area within the STAMP Site to a discharge point in Oak Orchard Creek along Highway 63, approximately 4.8 miles north of the Hamlet of Alabama.

The new Force Main would cross Crosby Road, and be located along a proposed access roadway on the STAMP Site, Lewiston Road (NYS Route 77), Salt Works Road, West Shelby Road, and to the discharge point in Oak Orchard Creek along Highway 63.

The project area consists of lawn area, farm fields, woodlands, road embankments, driveways and roadway crossings. Portions of the project include stream crossings, State and Federal wetland crossings, and crossing the TWMA lands. The new Force Main would be primarily installed within the existing roadway rights-of-way along the route except for a few areas located within permanent easements.

The estimated construction cost of Alternative A is $16.7 million. It is estimated that installation of the Force Main for Alternative A would take approximately 35 weeks to complete.

Alternative A was not identified as the Applicant Preferred Action by the GCEDC based on an approximately 3.2-mile greater project distance and an increased cost of approximately $3.6 million as compared with Alternative B. Important to the Applicant in evaluating Alternative A was the fact that even though no USFWS permits would be needed for Alternative A, there are no environmental benefits as compared to Alternative B as a result of avoiding the INWR and constructing instead within the TWMA. In fact, because of the longer length of the project, particularly within the TWMA, there would be equal or additional environmental impacts as a result of selecting Alternative A along with greater socioeconomic impacts.

Applicants note that economic factors, such as the costs of different alternatives, should be taken into consideration and balanced against the environmental impacts throughout the NEPA process. *See Calvert Cliffs' Coordinating Comm., Inc. v. U.S. Atomic Energy Comm'n*, 449 F.2d 1109, 1113 (D.C. Cir. 1971). The Calvert Cliffs' case is particularly helpful in that the Court quotes Senator Henry Jackson, NEPA's principal sponsor, in its discussion of the purposes and mandates of NEPA Section 102 (42 U.S.C. § 4332, which provides the mechanism for achieving NEPA policy and goals). As a part of the discussion, the Court noted that agencies must identify and develop methods and procedures to give appropriate consideration to

economic and technical considerations and must balance those interests with environmental amenities/costs. *Id*. Thus, it is appropriate for agencies to consider economic feasibility in an alternatives analysis. *See Wright v. Inman*, 923 F. Supp. 1295, 1303 (D. Nev. 1996) (citing *Sylvester v. U.S. Army Corps of Engineers*, 882 F.2d 407, 409 (9th Cir. 1989). In *Sylvester*, the Court stated that the Corps may legitimately consider cost to the applicant in evaluating alternatives. 882 F.2d at 409.

2.3.1 Alternative A – Segment within TWMA

The portion of Alternative A that would be located within the TWMA, which is the focus of this EA, would include:

- Installation of approximately 15,900 linear feet of Force Main,
- A new right-of-way approval for a total of 15.70 acres (a width of 43' measured from the roadway centerline on the east side of Lewiston Road),
- Approximately 30 main line valves,
- Approximately 15 maintenance manholes,
- Approximately 2 metering manholes,
- Approximately 15 Force Main markers; and
- Approximately 31 staging areas, each 1,200 square feet, totaling disturbance of 0.85 acres.

Construction of the segment of Alternative A located within the TWMA would be limited to an estimated 10-week window that would be scheduled in coordination with NYSDEC and USFWS to avoid the migratory bird breeding and nesting season.

Depending on field conditions, the number of staging areas could be reduced during construction to reduce environmental impacts, if, for example, the Contractor were able to install longer HDD segments or if the mid-point staging area could be eliminated. Additional staging areas would not be expected to be required, but in the event of an equipment malfunction, emergency or unforeseen circumstances during construction, it may be necessary to install additional staging areas in locations not previously identified or modify the location of a proposed staging area. Every effort would be made during construction to avoid modifying the proposed layout. Coordination and authorization from TWMA personnel would be required prior to making any layout changes.

2.4 Alternative B (Applicant Preferred Action) – Issuance of ROW from INWR

Alternative B (Applicant Preferred Action) involves the installation of a total length of approximately 33,000 linear feet of 18" PVC and 20" HDPE sanitary force main, main line valves, maintenance manholes, metering manholes, and Force Main markers. The new Force Main would convey effluent from the Main Sanitary Pump Station located at the utility area within the STAMP site along Crosby Road, Lewiston Road (NYS Route 77), Alleghany Road (NYS Route 63) and to a discharge point in Oak Orchard Creek along Highway 63 approximately 4.8 miles north of the Hamlet of Alabama. Design details for Alternative B are provided in the Engineering Report in Appendix A.

The project area consists of fields, woodlands, road embankments, driveways and roadway crossings. Portions of the project include stream crossings, State and Federal wetland crossings, and crossing the INWR lands. The new Force Main would be primarily installed within the existing roadway rights-of-way except for a few areas located within permanent easements.

The estimated construction cost of Alternative B is $13.1 million. It is estimated that Alternative B would take approximately 27 weeks to construct. Alternative B was identified as the Applicant Preferred Action by the GCEDC with input from NYSDEC regarding the surface water discharge location.

2.4.1 Alternative B – Segment within INWR

The portion of Alternative B that would be located within the INWR, which is the focus of this EA, would include:

- Installation of approximately 14,332 linear feet of Force Main,
- A new right-of-way approval for a total of 14.32 acres (a width of 43' measured from the roadway centerline on the west side of NYS Route 63 for most of the route, with a width of 54' measured from the roadway centerline along an 800-foot segment to avoid an existing NYS DOT bridge and concrete wingwalls at a crossing of Oak Orchard Creek),
- Approximately 27 main line valves,
- Approximately 12 maintenance manholes,
- Approximately 2 metering manholes,
- Approximately 14 Force Main markers; and
- Approximately 27 staging areas, each 1,200 square feet, totaling disturbance of 0.74 acres.

Construction of the segment of Alternative B located within the INWR would be limited to an estimated 8-week window that would be scheduled in coordination with USFWS to avoid the migratory bird breeding and nesting season.

Depending on field conditions, the number of staging areas could be reduced during construction to reduce environmental impacts, if, for example, the Contractor were able to install longer HDD segments or if the mid-point staging area could be eliminated. Additional staging areas would not be expected to be required, but in the event of an equipment malfunction, emergency or unforeseen circumstances during construction, it may be necessary to install additional staging areas in locations not previously identified or modify the location of a proposed staging area. Every effort would be made during construction to avoid modifying the proposed layout. Coordination and authorization from INWR personnel would be required prior to making any layout changes.

In addition to installation of the Force Main, Alternative B includes a proposal to enhance two of four existing access roads that connect Route 63 with the berm of a large managed wetland on INWR and to remove the other two access roads that are currently unused and restore to wetland (Figure 7). Enhancement of the two access roads currently being used could include replacing deteriorated culvert pipe, adding crushed stone, and grading to provide a smooth, even driving/parking surface to facilitate

management access by refuge staff and public access as appropriate. Removal of the two currently unused access roads would involve removal of the existing culvert pipe, excavation of all existing, imported earthen material to original grade, disposal of excess material to an appropriate off site location. The disturbed area would then be restored to wetland by recontouring soil and replacing topsoil to blend in with the surrounding grade and seeding with a native wetland seed mix appropriate to the adjacent wetland type. The enhancement and removal/restoration of existing access roads described above would be feasible if completed as part of the installation of the proposed Force Main. The result would support the mission of the National Wildlife Refuge System by improving access for habitat management, wildlife management, and public access.

The GCEDC anticipates forming a sewage works corporation under the New York State Transportation Corporations Law to own and operate all STAMP sewage infrastructure including the Force Main that would cross the Refuge along NYS Route 63. Pursuant to New York State law, a sewage works corporation is organized to provide for the disposal of sewage, through a system of pipelines, treatment plants and other means of disposal, and erects, operates, maintains and performs other necessary acts related to disposal systems for sewer areas formed within towns, villages or other municipal areas of the state. Formation of the sewage works corporation, and design of the system is subject to the review and approval of affected local governments, the County Department of Health, as well as the New York State Public Service Commission. In conjunction with the construction and operation of the sewage system, the sewage works corporation must post a performance bond for cost of construction of the system and must also guarantee that it will maintain and operate the system for at least five years in the amount of the estimated cost of operation and maintenance less estimated revenue. Additionally, the stock of the sewage works corporation must be placed in escrow and title will pass to the local government in the event of failure to complete construction or abandonment of maintenance and operation. Finally, the sewage works corporation has the right to acquire real estate or any interest therein necessary for purposes of incorporation, by condemnation or agreement, and may lay, repair or maintain the system over the lands of others. Overall, the State of New York has a thorough and comprehensive set of requirements for sewage works corporations formed under the New York State Transportation Corporations Law to ensure safe and reliable construction, maintenance and operation of sewage systems owned by such entities.

Chapter 3 Affected Environment and Environmental Consequences

3.1 Introduction

This chapter describes the existing conditions within the proposed project areas. The existing conditions, or affected environment, are the baseline conditions that may be affected by the proposed alternatives. This chapter also summarizes the positive and negative direct and indirect environmental impacts of the project alternatives, as well as cumulative impacts. As defined by the CEQ, direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable (40 CFR 1508.8). A cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Avoidance, minimization, and mitigation measures for adverse impacts are also addressed. As defined by the CEQ (40 CFR 1508.20), mitigation may include:

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- Compensating for the impact by replacing or providing substitute resources or environments.

For each resource or impact category discussed, only the project segment within the TWMA (Alternative A) or the INWR (Alternative B) is addressed. .

3.2 Land Use

The TWMA and INWR are zoned as land conservation uses in Genesee and Orleans Counties. As mentioned in Section 1.3, the INWR is approximately 10,828 acres in size and is managed by USFWS for the purpose of wildlife conservation. Containing the Oak Orchard Swamp, with over 6,000 acres in wetlands, the INWR serves as a nesting, feeding, resting, and staging area for migratory waterfowl. The INWR is also home to more than 3,000 acres of bottomland hardwood and 1,800 acres of grasslands and shrublands; its habitats support approximately 260 species of birds, 42 species of mammals, and reptiles, fish, amphibians and insects. NYS Route 63 bisects the INWR in the north/south direction. The TWMA is approximately 3,100 acres in size and is owned by the State of New York and managed by NYSDEC for the purposes of wildlife management, wildlife habitat management, and wildlife-dependent recreation. It is

located in the Tonawanda Creek floodplain southwest of the Oak Orchard Swamp – southwest of and contiguous to the INWR, separated from the INWR by Lewiston Road.

3.2.1 Land Use Impacts/Mitigation

Alternative A (No Action) – Alternative A would be located primarily within the existing Lewiston Road right-of-way within the TWMA. Approximately 15.70 acres of new right-of-way would be required from the TWMA, with temporary disturbances to approximately 0.85 acre of lands within the TWMA resulting from construction of staging areas to facilitate HDD installation of the Force Main. Following construction, all disturbed areas would be restored to their original conditions. Permanent changes to ground surface include presence of valve boxes, maintenance manhole covers, and metering manhole covers. These will remain in place at grade. Collectively these total less than 0.07 acre. Because of the directional drill method and minimal long term changes along the proposed right-of-way, there is no significant land use impacts that would result from Alternative A.

Land uses within the TWMA are managed by NYSDEC in accordance with management goals and applicable plans. As land use impacts to the TWMA resulting from Alternative A would be minor in context and intensity, temporary, and fully restored, Alternative A is not expected to cause or contribute to significant cumulative impacts to land uses in the TWMA.

Alternative B (Applicant Preferred Action) – Alternative B would be located primarily within existing NYS Route 63 rights-of-way within the INWR. Approximately 14.32 acres of new right-of-way would be required from the INWR, with temporary disturbances to approximately 0.74 acre of lands within the INWR resulting from construction of staging areas to facilitate HDD installation of the Force Main. Following construction, all disturbed areas would be restored to their original conditions. Permanent changes to ground surface include presence of valve boxes, maintenance manhole covers, and metering manhole covers. These will remain in place at grade. Collectively these total less than 0.06 acre. Because of the directional drill method and minimal long term changes along the proposed right-of-way, there is no significant land use impacts that would result from Alternative B.

In addition to mitigation through the general best management practices (BMPs) and restoration of temporary impact areas, Alternative B includes planned improvements to two of the four existing access roads connecting Route 63 with INWR to facilitate habitat management and access, and removal of the two unused access roads followed by restoration to wetland habitat. This is in addition to any mitigation necessary as part of local, state, and federal permit conditions.

Land uses within the INWR are managed by USFWS in accordance with management goals and applicable plans. As land use impacts to the INWR resulting from Alternative B would be minor in context and intensity, temporary, fully restored, and compensated for with any necessary permit-related mitigation and improvements or restoration of existing access roads, Alternative B is not expected to cause or contribute to significant cumulative impacts to land uses in the INWR.

3.3 Soils

A review of NRCS soil survey data revealed 22 soil types within the Alternative A project area (in the TWMA) and 15 soil types within the Alternative B project area (in the INWR) (NRCS, 2017). Seven soil types are found along both routes. **Please see Appendix C for details.**

3.3.1 Soils Impacts/Mitigation

Alternative A (No Action) – Alternative A would result in disturbances to approximately 0.85 acre of soils within the TWMA.

Alternative B (Applicant Preferred Action) – Alternative B would result in disturbances to approximately 0.74 acre of soils within the INWR.

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – Soil impacts would be localized and largely contained within previously disturbed roadway right-of-way corridors. Use of HDD construction methods would reduce impacts to soils by 90% as compared with an open trench method. BMPs would be implemented to further minimize these impacts. Surface disturbance caused by construction of the Force Main would result in the removal of vegetation from the soil surface. This can damage soil crusts and destabilize the soil. As a result, the soil surface could become more prone to accelerated erosion by wind and water. BMPs used during construction to reduce these impacts would include:

- Erosion and sediment control measures during and after construction
- Segregating topsoil from subsurface material for future reclamation
- Re-seeding of disturbed areas using native seed mix immediately after construction activities are complete
- Use of appropriately sized construction equipment for the scope and scale of the project
- Maintaining proper drainage
- Regrading to match original topography following installation of the Force Main

Soil compaction can occur by use of heavy equipment. When soil is compacted, it decreases permeability and increases surface runoff. This is especially evident in silt and clay soils. In addition, soils may be impacted by the mixing of soil horizons. Soil compaction and mixing of soil horizons would be minimized by topsoil segregation.

HDD techniques require the use of drilling fluid to keep the drilling head cool, stabilize the bore hole and lubricate the pipe during pulling operations. The drilling fluid is made from mixing bentonite and other additives with water to produce a slurry that can be pumped. Rarely, an inadvertent release of drilling fluid can occur during the HDD process. Drilling fluid seepage is generally the result of pressurization of the drill hole beyond the containment capability of the overburden soil material or as a result of fractures in the rock, low density soils or unconsolidated soils. Providing adequate depth of cover for the installation of the pipe reduces this potential.

The contractor would control the fluid injection rate and actively monitor the fluid levels at the entrance and exit points during the HDD process. The staging areas would contain temporary fluid containment areas which would provide early indications of fluid encroaching on the surface. The HDD operations would have equipment to contain the fluid in the event that the fluid broke initial containment including excavation and vacuum abilities (back hoes and Vacuum trucks). If the fluid began to encroach the surface, drilling operations would be immediately suspended until fluid containment is regained.

Contamination of soils from a leak once the proposed Force Main is operational is not anticipated. However, in the event there is a leak, the effluent would not pose a threat to the environment because of the contents of the Force Main meets regulatory agency permit limits for direct discharge. The entire length of the Force Main would be pressure tested to ensure there are no leaks prior to placing it into service. A qualified operations and maintenance company would monitor the flows entering and exiting the TWMA or INWR weekly to ensure that there are no leaks. In the event that a leak occurred, all pumping operations would be stopped, an Emergency Response Plan would be activated, and NYSDEC and USFWS would be immediately notified (See Appendix A).The immediate upstream and downstream main line valves would be closed to isolate the leak and reduce the amount of effluent flowing to the leak area. The Force Main would be repaired by excavating down to the damaged area, replacing the damaged pipe and installing the necessary repair fittings.

Soils within the TWMA and INWR are largely protected from disturbance, aside from those consistent with management activities (e.g. diking and impoundments, prescribed fires, reforestation, etc.). As soil impacts resulting from Alternatives A and B would be minor in context and intensity as well as temporary, Alternatives A and B are not expected to cause or contribute to significant cumulative impacts to soils in the TWMA or INWR.

3.4 Surface Water

The proposed project area is located in two watersheds: the Niagara River/Lake Erie Watershed (southern part of project area) and the Lake Ontario Tributaries Watershed (northern part of project area). This area is topographically flat and rife with streams and tributaries draining generally west to the Niagara River/Lake Erie or generally north to Lake Ontario (NYSDEC, 2017).

3.4.1 Surface Water Impacts/Mitigation

Alternative A (No Action) – Alternative A would require three stream crossings located within the TWMA (crossing #1-3 on map). **Please see Figure 2.**

Alternative B (Applicant Preferred Action) –Alternative B would require four stream crossings located within the INWR (crossing #5-8 on map). **Please see Figure 2.** A Pre-Construction Notification (PCN) was submitted to USACE and NYSDEC in June 2016.

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – HDD methods would be used to avoid impacts to bed and bank at all stream crossing locations. No direct or indirect impacts to streams or other surface waters are anticipated.

All of the streams and tributaries that would be crossed are Class C, Standard C, meaning that they are not considered "protected waters" by the State, and the proposed crossings would not require a New York State Protection of Waters permit. Class C waters support fisheries and are suitable for non-contact activities.

Some or all of these streams may be under the jurisdiction of the US Army Corps of Engineers (USACE-JD) as Waters of the US (WOUS); it is anticipated a Nationwide Permit (NWP) 12 – Utility Line Activities and associated Clean Water Act (CWA) Section 401 Water Quality Certification would be needed for crossings of WOUS.

Streams within the TWMA and INWR are largely protected from disturbance; however, other past, present, and reasonably foreseeable future actions outside the TWMA and INWR can impact the streams within these protected borders, including water quality of the streams. According to NYSDEC, major sources of water quality concerns in these watersheds include agricultural and other nonpoint sources of pollutants, legacy industrial contaminants, and invasive and other aquatic plant growth (NYSDEC, 2017). Because the streams within the TWMA and INWR would be avoided by Alternatives A and B, they would not cause or contribute to any cumulative impacts to surface water within the TWMA and/or the INWR.

3.5 Wetlands

To determine the wetland resources within the proposed project area, National Wetlands Inventory (NWI) maps and NYSDEC maps identifying State-regulated wetlands and associated buffers were reviewed. The predominant wetland feature on the landscape within the proposed project area is the Oak Orchard wetland complex, which is partially located in the INWR and TWMA. A variety of palustrine emergent, palustrine forested, and palustrine scrub-shrub wetlands are associated with this complex. **Please refer to Figures 3 and 4.**

3.5.1 Wetland Impacts/Mitigation

Alternative A (No Action) – All wetlands located outside the TWMA would be avoided using HDD construction methods. Impacts to wetlands within the TWMA would be minimized with the use of HDD; however, avoidance of wetlands would not be possible due to the nature of the TWMA. Construction of the Force Main would generate impacts to wetland/buffer totaling approximately 0.68 acre. These federal and state-mapped wetlands and buffers are all part of the Oak Orchard wetland complex. Impacts would be localized to those wetland areas located immediately adjacent to Lewiston Road. While the vast majority of the unavoidable wetland impacts would be temporary (0.61 acre), minor permanent impacts of approximately 0.07 acre would result from the main line valves, maintenance and metering manholes, and Force Main markers that would remain in place in wetland areas once the Force Main was operational. **Please see Table 1.**

Table 1 - Alternative A Wetland/Buffer Impacts in TWMA

Total Impacts (acres)	Temporary Impacts (acres)	Permanent Impacts
0.68	0.61	0.07

Prior to construction, a field wetland delineation would be completed for wetlands and buffers along the proposed project corridor and submitted to USACE and NYSDEC for a jurisdictional/regulatory determination of boundaries. A refined impact assessment would be completed based on the delineation maps prepared using GPS of wetland boundaries in the field.

Alternative B (Applicant Preferred Action) – All wetlands located outside the INWR would be avoided using HDD construction methods. Impacts to wetlands within the INWR would be minimized with the use of HDD; however, avoidance of wetlands would not be possible due to the nature of the INWR. Construction of the Force Main would generate impacts to wetland/buffer totaling approximately 0.56 acre. These wetlands and buffers are part of the Oak Orchard wetland complex. Impacts would be localized to those wetland areas located immediately adjacent to NYS Route 63. While the vast majority of the unavoidable wetland impacts would be temporary (0.50 acre), minor permanent impacts of approximately 0.06 acre would result from the main line valves, maintenance and metering manholes, and Force Main markers that would remain in place in wetland areas once the new Force Main was operational. **Please see Table 2.**

Table 2 - Alternative B Temporary Wetland/Buffer Impacts in INWR

Total Impacts (acres)	Temporary Impacts (acres)	Permanent Impacts
0.56	0.50	0.06

A field wetland delineation has been completed for wetlands within the INWR by CC Environment & Planning (CCEP) (CCEP, 2016) and was submitted to USACE and NYSDEC in June 2016.

In addition to restoration of temporary disturbance areas and any required compensatory mitigation for wetland impacts (described below), construction of the Force Main through INWR includes a proposal to remove two unused access roads and culverts west of Route 63 within the proposed ROW and to restore these areas to wetland habitat if desired by USFWS. **Please see Figure 7.**

Removal of unused access roads would involve removal of the existing culvert pipe, excavation of all existing, imported earthen material to original grade, disposal of excess material to an appropriate off site location. The disturbed area would then be restored to wetland by recontouring soil and replacing topsoil to blend in with the surrounding grade and seeding with a native wetland seed mix appropriate to the adjacent wetland type.

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – Immediately following construction within either the TWMA or the INWR, the disturbed wetland areas would be restored. The staging areas would be removed, restoring hydrology to the wetland areas. The Site would be re-contoured to match pre-disturbance conditions and re-seeded with a native wetland seed mix appropriate to the adjacent wetland type (e.g. emergent, forested, scrub/shrub). The only exception being manhole covers that will be at or above the elevation of the centerline of the road and graded and planted to blend in visually. As mentioned previously, topsoil would be segregated from subsoil during construction and

would be used in the restoration – no new topsoil would be brought into the TWMA or the INWR from outside the management area/refuge, to minimize the potential for introduction of invasive species.

An NWP-12 would be required for any unavoidable impacts to USACE-JD wetlands that are less than 0.5 acre. A CWA Section 404 Individual Permit would be required for unavoidable impacts to any USACE-JD wetlands that exceed 0.5 acre. A Section 401 Water Quality Certification would be required from NYSDEC for any impacts requiring an Individual Permit or NWP. A NYS Freshwater Wetlands Permit would also be required from NYSDEC for any unavoidable impacts to NYSDEC-regulated wetlands, including the 100' buffer area surrounding the wetland.

Wetland mitigation measures including avoidance, minimization, and restoration would be implemented as described. Additional measures, including compensation for impacts by providing substitute resources, may be required to ensure no net loss of wetland functions and values of the resource. A wetland mitigation plan would be developed in coordination with USACE, NYSDEC, and USFWS, as determined necessary through coordination with each agency. USACE and USFWS both use landscape-level (watershed) approaches to compensatory wetland mitigation planning (USACE, 2008; USFWS, 2016a), while NYSDEC's policy is to provide compensatory mitigation in the immediate vicinity of the impact [6 CRR-NY 663.5(g)(1)(i)]. The USACE generally does not require compensatory mitigation for impacts less than 0.1 acre per basin. NYSDEC does not have a defined impact threshold for requiring compensatory mitigation; its need is determined on a case-by-case basis. The USFWS generally adheres to the "no net loss" policy of functions and values. It is possible that different wetland mitigation activities would be necessary to satisfy each agency. At a minimum, compensatory mitigation through the purchase of in lieu fee credit will ensure no net loss of wetland acreage, function and value.

No indirect impacts to wetlands are anticipated. It has been estimated that more than 50% of wetlands in New York State had been lost to agricultural drainage, development, and other human uses (Dahl and Allord, 1997). Within the TWMA and INWR, wetland habitats are protected, and wetland acreages and functions have been gained over time as a result of management activities. The majority of wetland impacts associated with Alternatives A and B would be temporary and fully restored with the exception permanent impacts associated with valves and manhole covers (0.06 acre for Alternative B). Compensatory mitigation would ensure no net loss of any permanent impacts. Therefore, the proposed project is not expected to cause or contribute to significant cumulative impacts to wetlands, positively or negatively.

3.6 Groundwater

A review of the depth to groundwater associated with the soils within the proposed project area revealed dozens of ratings ranging from zero to greater than 200 centimeters (NRCS, 2017). A USGS groundwater monitoring well is located in the proposed project area, on the north border of the INWR (Dunlop Road) just west of NYS Route 63 (Site Number 430924078241301, Local number OI-27). Between December 5, 2008 and December 7, 2016, depth to groundwater was continuously recorded at this location. The

maximum level was 38.34 feet below ground surface. The minimum level was 48.29 feet below ground surface. The mean groundwater depth was 41.79 feet below ground surface (USGS, 2017a).

A review of aquifer data identified one unconfined aquifer located in the northern portion of the project area, along the proposed Alternative A (No Action) route. **Please see Figure 5, Groundwater.**

3.6.1 Groundwater Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – As reported by NYSDEC (NYSDEC, 2017a), groundwater contamination from sewer lines is estimated to be low in the State, and Force Main leaks are usually detected and corrected quickly. This type of activity has been given a statewide "low" level of concern for groundwater contamination by NYSDEC.

Direct or indirect groundwater impacts are not anticipated from either proposed project alternative. The groundwater depth is substantially lower than the proposed Force Main depth (5-6 feet below ground surface). The unlikely occurrence of a drilling fluid leak during construction operations or a leak once the proposed Force Main system is operational could have the potential to contaminate groundwater resources beneath and downstream of the area(s) experiencing a leak. If a drilling fluid or Force Main leak were to occur, it is anticipated that it would be quickly detected and resolved without contaminating groundwater resources.

The contractor would control the drilling fluid injection rate and actively monitor the fluid levels at the entrance and exit points during the HDD process. The staging areas would contain temporary fluid containment areas which would provide early indications of fluid encroaching on the surface. The HDD operations would have equipment to contain the fluid in the event that the fluid broke initial containment including excavation and vacuum abilities (back hoes and Vacuum trucks). If the fluid began to encroach the surface, drilling operations would be immediately suspended until fluid containment is regained.

The entire length of the Force Main would be pressure tested to ensure there are no leaks prior to placing it into service. An operations and maintenance provider would monitor the flows entering and exiting the TWMA/INWR weekly to ensure that there are no leaks. In the event that a leak occurred, as per the Emergency Response Plan (Appendix A), all pumping operations would be stopped and NYSDEC and USFWS would be immediately notified. The immediate upstream and downstream main line valves would be closed to isolate the leak and reduce the amount of fluid flowing to the leak area. The Force Main would be repaired by excavating down to the damaged area, replacing the damaged pipe and installing the necessary repair fittings.

Because no direct or indirect impacts are anticipated, Alternatives A and B would also not contribute to cumulative impacts to groundwater.

3.7 Floodplains

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), much of the proposed project area is located within a 100-year floodplain associated with the Oak Orchard Creek wetland system. This includes the INWR and TWMA lands. **Please see Figure 6, Floodplains.**

3.7.1 Floodplain Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) –Alternatives A and B would involve construction in a mapped floodplain. However, the proposed project alternatives both consist primarily of a buried utility line that would not change elevations or add fill in the floodplain. No direct or indirect impacts to the floodplain would result from the utility line in either alternative. Ancillary and permanent infrastructure (valves and manhole covers) will result in approximately 104.4 cubic yards of fill in floodplain areas for Alternative A and 139.2 cubic yards of fill in floodplain areas for Alternative B. In both cases, fill is minimal with no significant impacts to the floodplain. Coordination with local floodplain permit and certification administrators would be required.

3.8 Vegetation

CC Environment & Planning conducted a field review of the proposed project area in November 2015 and May 2016. Most of these lands are previously disturbed upland areas including roadway shoulders, mowed roadway shoulders, excavated ditches, culverts, and brushy cleared land. A smaller portion of the project area, primarily at stream and wetland crossings and adjacent to federal and State-owned lands, consists of intermittent and perennial streams and wetlands (shallow emergent marsh, common reed marsh, shrub swamp, and red maple hardwood swamp). Ecological communities referenced above are designated in accordance with community descriptions in *Ecological Communities of New York State* (Edinger et al. 2014).

Commonly observed plant species during the field review are shown in **Appendix D, Common Plant Species in Project Area**. No State-protected native plants were identified during the field review.

3.8.1 Vegetation Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – Ground clearing activities associated with construction of the Force Main would result in vegetation disturbance to approximately 0.85 or 0.74 acre, respectively. The areas of proposed surface disturbances are minimized through use of HDD and are predominantly located in previously disturbed roadway rights-of-way.

Care would be taken to prevent the introduction or spread of invasive plant species, which is a potential indirect impact associated with both alternatives. BMPs related to invasive species management that would be incorporated into the proposed project include:

- Use of a weed-free source for project materials
- No topsoil would be brought into the TWMA (Alternative A)/INWR (Alternative B)
- Use of designated cleaning areas for tools, equipment and vehicles

- Inspection and cleaning of tools, equipment and vehicles before entering the TWMA/INWR
- Minimize soil disturbances within the TWMA/INWR through use of HDD construction methods
- Implement erosion control methods during and after construction
- Re-seed disturbed areas with native plant mix appropriate to pre-construction conditions and consistent with surrounding vegetation
- Commitment to monitor and manage the restoration of disturbed areas for noxious weeds and successful restoration of native plant communities for 2 seasons following construction

Other past, present, and reasonably foreseeable future actions within the TWMA and INWR that affect vegetation are largely associated with management activities aimed at creating and improving the desired wildlife habitats. Because the direct and indirect impacts to vegetation associated with Alternatives A and B are minimal in context and intensity, are temporary, and are expected to be fully mitigated, these alternatives are not expected to cause or contribute to significant cumulative impacts to vegetation within the TWMA or INWR.

3.9 Noise

The baseline existing noise levels at the TWMA and INWR are not known; however, it is expected that the primary noise source at both of these locations is traffic. The segment of Alternative A located within the TWMA (Lewiston Road) currently receives average daily traffic volumes of less than 2,400 vehicles with a posted speed limit of 40 miles per hour (NYSDOT, 2016). The segment of Alternative B located within the INWR (NYS Route 63) currently receives average daily traffic volumes of nearly 5,000 vehicles with a posted speed limit of 55 miles per hour (NYSDOT, 2016).

3.9.1 Noise Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – Construction activities would generate noise. Construction would typically occur on weekdays (Monday-Friday) during business hours (approximately 7 am – 4 pm).

Due to the large amount of high quality habitat for breeding and nesting birds, as well as other wildlife species, available at the TWMA and the INWR, it is anticipated that noise-sensitive species would not nest in close proximity to Lewiston Road or NYS Route 63. However, individual birds or other wildlife may be present and be temporarily affected by construction noise activities; such impacts may include dispersal to habitats with lower noise levels, stress, disruption of feeding, drowning out of mating calls, masking of predator approaches, and/or suppression of animal sounds (Yong, 2017). Most avian species are particularly vulnerable during nesting and migration periods. Performing construction during these periods may decrease reproductive success. Therefore, the 8-10 week construction duration within the TWMA or INWR would be timed in coordination with USFWS to avoid the breeding and nesting season for migratory birds.

Following construction, the Force Main and ancillary infrastructure would not generate noise. Indirect noise impacts are not anticipated. Due to the short duration of the temporary construction impacts and

the proposed mitigation, Alternatives A and B are not expected to cause or contribute to significant cumulative noise impacts.

3.10 Threatened and Endangered Species

3.10.1 Federally Listed Species

In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, 50 CFR Part 402, as amended, each federal agency is required to ensure the following two criteria: first, any action authorized, funded or carried out by such agency must not be likely to jeopardize the continued existence of any federally-listed endangered or threatened species or species proposed to be listed. Second, no such action can result in the destruction or adverse modification of habitat of such species that is designated or proposed to be designated critical by the US Department of Interior Secretary.

Section 9 of the ESA prohibits the "take" of species listed by USFWS as threatened or endangered. Take is defined as follows: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that a take cannot always be avoided, Section 10(a) of the ESA includes provisions for take that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) incidental take permits (ITPs) may be issued if take is incidental and does not jeopardize the survival and recovery of the species (50 CFR 17.32 and 17.22). In conjunction with the application for an ITP, a Habitat Conservation Plan (HCP) is required under section 10(a)(1)(B) of the Act to describe the anticipated effects of the proposed taking by non-federal entities. Specifically, an HCP describes how impacts will be avoided and minimized to the maximum extent practicable, unavoidable impacts will be mitigated, and how the funding for the conservation plan is assured. An HCP can include listed as well as non-listed species, such as candidate species or species which have been proposed for listing. USFWS will complete an internal Section 7 conference process prior to issuance of any ITP.

A report provided from the USFWS ECOS-IPaC website for the proposed project area in Genesee and Orleans Counties, New York, identified one federally-listed species: the threatened northern long-eared bat (*Myotis septentrionalis)*. There are no other federally listed, proposed, or candidate species and no designated or proposed critical habitats.

Northern Long-eared Bat

The northern long-eared bat (NLEB) is a medium-sized bat that occurs across central, eastern and northern portions of the United States and across Canada. During summer months, the species commonly roosts singly or in colonies in the trees of wooded areas, and to a lesser extent in caves, mines and the built environment. Foraging for insects occurs at night and, for females, the home range has been documented to be from 47 to 425 acres in size. Roost sites change frequently and can be up to approximately one mile apart from one another (USFWS, 2015a).

Potential roosts sites include live trees or snags that are greater than or equal to three inches' diameter at breast height that exhibit exfoliating bark, cracks, crevices or cavities. Isolated trees may be potential roost sites if they exhibit the characteristics described above and are less than 1,000 feet from the nearest

roosting site or suitable wooded habitat (USFWS, 2014). From mid-summer to fall, bats move to hibernacula to breed and hibernate. The distance between roost and hibernacula can range from five to 168 miles (USFWS, 2015a). The fungal disease white-nose syndrome is the primary threat to the species.

The USFWS Summer Survey Guidelines for 2016 were followed to identify the potential for suitable NLEB habitat within the proposed project area in order to assess the potential for adverse effects to the species, as summarized in Table 3 below.

Table 3 - Initial Project Screening Summary for Northern Long-Eared Bat

Actions Taken Per USFWS 2016 Summer Survey Guidelines for Phase I – Initial Project Screening	Results Summary
Step 1. Coordinate with the USFWS Field Office regarding existing NLEB summer occurrence information	Determined that proposed action is not located near known maternity sites or within 0.25 miles of a known hibernaculum as of April 15, 2016[1]
Step 2. Conduct habitat assessment (desktop or field-based)	Trees that could provide potentially suitable summer habitat were identified in the field at five locations along the proposed project corridor. Many of these trees are conifers located singly or in small groups in residential settings. While potential habitat is minimal within the proposed project corridors, diverse and high- quality habitat is available immediately adjacent, throughout the TWMA and INWR.
Step 3. Assess potential for adverse effects to NLEB	Tree removal associated with construction activities have the potential to impact individual bats, if present. Following construction, operation of the proposed sanitary sewer Force Main would not result in any impacts to the species or its habitat.

3.10.2 Federally Listed Species Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – A project commitment has been made to schedule any necessary tree removal to outside the pup season (June 1 – July 31) and, where possible, within the hibernation period (October 31 – March 31) to avoid impacts to the NLEB. Based on the presence of minimal potential habitat along the proposed project corridor, no known maternity sites or hibernaculum, and temporal restrictions on tree removal, it is anticipated that the proposed action may affect, but is not likely to adversely affect, the NLEB. This determination is appropriate when the proposed project is likely to cause insignificant, discountable, or wholly beneficial effects to individuals of listed species.

3.10.3 State Listed Species

State-listed species that have been recorded in the general vicinity of the project alternatives include five threatened avian species: the pied-billed grebe *(Podilymbus podiceps)*, sedge wren *(Cistothorus platensis)*, Henslow's sparrow *(Ammodramus henslowii),* bald eagle (*Haliaeetus leucocephalus*), and northern harrier

[1] http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html

(*Circus cyaneus*), as well as the endangered eastern massasauga rattlesnake (*Sistrurus catenatus*) and the endangered bog turtle (*Clemmys muhlenbergii*).

Pied-Billed Grebe

The pied-billed grebe is a small waterbird whose range extends from the southern U.S. to Central America and parts of South America. The pied-billed grebe migrates to New York State sometime between late March and mid-April and remains through the fall, heading south between September and November. Pied-billed grebes rely on large wetlands with "hemi-marsh" (an even mixture of emergent vegetation and open water) conditions that provide sufficient cover for nesting and are deep enough for underwater foraging. Breeding grounds for the species are scattered across New York State, with confirmed sightings of the species in the general vicinity of the proposed action – near the Genesee/Orleans/Niagara County border – during the breeding bird surveys conducted in 1980-1985 as well as 2000-2005. Historic declines of the species resulted from habitat loss and residual effects of DDT and other pesticide exposure. Wetland conservation and restoration efforts have helped to boost species numbers in recent years (NYSDEC, 2017b).

The pied-billed grebe is recorded as a species known to nest on or near the INWR (USFWS, 2007). A field review conducted by CCEP in November 2015 and May 2016 identified no potentially suitable habitat for the pied-billed grebe within the survey corridors; however, diverse and high quality habitats are available throughout the TWMA and INWR (CCEP, 2016).

Sedge Wren

The sedge wren is a small wren that is considered a short-distance migrant. Its range extends from the southeastern U.S. to the north central U.S. and central Canada. The sedge wren breeds in wet meadows or hayfields dominated by sedges and grasses. It is sensitive to changes in water level and vegetation, and within New York State its status has been elevated from a species of special concern to a threatened species. Breeding bird survey records identify probable sedge wren sightings in the general vicinity of the proposed action – near the Genesee County/Orleans County/Niagara County border – during 1980-1985 and both probable and possible sightings of the species during 2000-2005, with no confirmed sightings in Genesee or Orleans Counties during either survey. The primary threat to the sedge wren is loss of wetland breeding habitat (NYSDEC, 2017c).

The sedge wren is recorded as a species known to nest on or near the INWR (USFWS, 2007). A field review conducted by CCEP in November 2015 and May 2016 identified no potentially suitable habitat for the sedge wren within the survey corridors; however, diverse and high quality habitats are available throughout the TWMA and INWR (CCEP, 2016).

Henslow's Sparrow

The Henslow's sparrow breeds from South Dakota, Minnesota, Wisconsin, Michigan, Ontario, and Massachusetts south to Kansas, Missouri, Illinois, Kentucky, West Virginia, and North Carolina and locally in Texas. In New York, populations are very localized and found primarily in the central and western parts of the state. Henslow's sparrow habitat consists of fallow, weedy, often moist fields and meadows.

Breeding occurs in a variety of habitats with tall, dense grass and herbaceous vegetation, including upland weedy hayfields, pastures without shrubs, wet meadows, drier areas of salt marshes, grassy fields, and sedge covered hillsides with recently planted pine seedlings. The species will also use lightly grazed pastures. The Henslow's sparrow population has been in decline for decades; the major threat to the species is a loss of breeding habitat as agricultural grasslands are developed or abandoned to subsequently revert back to forests. Breeding bird survey records identify one probable sighting near the western edge of the Genesee/Orleans County border in 1980-1985 and two probable sightings near the Genesee County/Orleans County/Niagara County border during 2000-2005 (NYSDEC, 2017d).

The Henslow's sparrow is recorded as a species known to nest on or near the INWR (USFWS, 2017). A field review conducted by CCEP in November 2015 and May 2016 identified no potentially suitable habitat for the Henslow's sparrow within the survey corridors; however, diverse and high quality habitats are available throughout the TWMA and INWR (CCEP, 2016).

Bald Eagle

In addition to being protected as a State-listed species, the bald eagle is protected through the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) of 1940. The MBTA, 916 U.S.C. 703-711, provides protection for 1,007 migratory bird species. The MBTA regulates impacts to these species such as direct mortality, habitat degradation, and/or displacement of individual birds. The MBTA defines "taking" to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof, except when specifically permitted by regulations. The BGEPA, 16 U.S.C. 668-668d, as amended, was written with the intent to protect and preserve bald and golden eagles, both of which are treated as species of concern within the Department of the Interior. BGEPA prohibits, except under certain specified conditions, the taking, possession, or commerce of bald and golden eagles. Under the BGEPA, to "take" includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb, wherein "disturb" means to agitate or bother a bald or golden eagle to the degree that it interferes or interrupts normal breeding, feeding or sheltering habitats, causing injury, death, or nest abandonment.

The bald eagle is found throughout North America, in every state except Hawaii, and in Canada. Eagles prefer undisturbed areas near large lakes and reservoirs, marshes and swamps, or stretches along rivers where they can find open water and fish. In the last century, reproductive impairment from pesticides, especially DDT, and heavy metals caused virtual extirpation of the bald eagle from New York and many other areas. Since the ban on DDT in 1972, eagles and other birds of prey are again producing young. Habitat destruction through logging and development along watercourses still poses a substantial threat to the species.

Bald eagles mate for life and return to nest in the general area from which they fledged. Once a pair selects a nesting territory, they use it for the rest of their lives. Nests are usually located high in tall, live white pine trees near water. Nests are reused and added to each year, often becoming more than eight feet deep, six feet across, and weighing hundreds of pounds.

Two pairs of bald eagles maintain nests on the INWR (USFWS, 2017a).

Northern Harrier

The northern harrier breeds in North America from northern Alaska and Canada south to central and southern California, Mexico and portions of the southern US, excluding the southeast region. Wintering occurs from southern Canada to northern South America. Communal flocks roost on the ground during winter and migratory periods in agricultural fields, abandoned fields and salt marshes. The northern harrier breeds in both freshwater and brackish marshes, tundra, fallow grasslands, meadows and cultivated fields. It nests in flimsy structures made of sticks and grass on the ground. The species experienced significant population declines in the 1950s due to losses of breeding habitat and the effects of pesticides (NYSDEC, 2017e).

The northern harrier is recorded as a species known to nest on or near the INWR (USFWS, 2007).

Bog Turtle

The bog turtle is New York's smallest turtle and one of the smallest turtles in the world. The species is found in the eastern U.S., scattered in disjunct colonies from New York and Massachusetts south to southern Tennessee and Georgia. This is a semi-aquatic species, preferring habitat with cool, shallow, slow-moving water, deep soft muck soils and tussock-forming herbaceous vegetation. In New York, the bog turtle is found in open, early successional types of habitats such as wet meadows or open calcareous boggy areas generally dominated by sedges or sphagnum moss. Threats to the species include habitat loss and degradation and illegal collecting. In New York, development and natural succession are the major threat to bog turtle habitat (NYSDEC, 2017f).

The bog turtle is also a federally-listed threatened species, and the USFWS identifies both Genesee and Orleans Counties as locations where the bog turtle is known or believed to occur (USFWS, 2017b). However, it should be noted that the species was not identified as listed for the proposed project area in the USFWS ECOS-IPaC query. Therefore, it is presumed that the species is not located within the proposed project area. A desktop and field habitat review conducted by CCEP in November 2015 and May 2016 identified a low potential for suitable habitat and low likelihood of species occurrence within the survey corridors (CCEP, 2016).

Eastern Massasauga

The eastern massasauga rattlesnake is a small snake – averaging two feet in length – with a thick body, heart-shaped head, and vertical pupils. This species is believed or known to occur in two counties in New York: Onondaga and Genesee, as well as nine other U.S. States and one Canadian province. Eastern massasauga rattlesnakes hibernate in the winter and are active in the spring, summer, and fall. During the active seasons, the snake generally uses higher, drier habitats, open canopy wetlands, and adjacent upland areas; however, this varies regionally, and individual snakes can be found in a wide variety of habitats, including many types of wetlands. During the winter, the species moves to lower, wet areas for overwintering or hibernation. Habitat loss and fragmentation are the primary threats to the species. Additional risk factors include disease and climate change (USFWS, 2016b).

It should be noted that while there is a presumed extant population of the eastern massasauga rattlesnake in Genesee County (USFWS, 2016c), the species was not identified as listed for the proposed project area in the USFWS ECOS-IPaC query. Therefore, it is presumed that the species is not located within the proposed project area. A field review conducted by CCEP in November 2015 and May 2016 identified a low potential for suitable habitat and low likelihood of species occurrence within the survey corridors (CCEP, 2016).

3.10.4 State Listed Species Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – Earthwork associated with construction activities undertaken for Alternatives A and B has the potential to impact individuals of the five state-listed threatened avian species (pied-billed grebe, sedge wren, Henslow's sparrow, bald eagle, and northern harrier), if present. Indirect impacts to these species can be caused by noise associated with construction activities (such as clearing, grading, and excavation), which may lead to dispersal to habitats of lower noise levels. Many studies over the past two decades have shown that human-made noise can cause stress, disrupt feeding, drown out mating calls, mask the approach of predators, and suppress the complexity of animal songs (Yong, 2017). The potential for other construction-related impacts, including temporary habitat avoidance, temporary habitat loss, dust generation, exposure to contaminants, and/or injuries due to construction vehicle collisions with wildlife, also exists.

The segment of Alternative A located within the TWMA is located within a roadway corridor (Lewiston Road) that experiences average daily traffic volumes of just under 2,400 vehicles with a posted speed limit of 40 mph. The segment of Alternative B located within the INWR is located within a roadway corridor (NYS Route 63) that experiences average daily traffic volumes of just under 5,000 vehicles with a posted speed limit of 55 mph.

The combined INWR/TWMA/Oak Orchard Management Areas provide approximately 19,000 acres of protected wetland habitats as well as a variety of other habitat types. Based on the abundant availability of suitable habitat outside of the roadway corridors, it is anticipated that species sensitive to noise would not be nesting immediately adjacent to the roadway corridors and are not likely to be affected by the proposed construction activities; however, it is possible that individual birds may be affected.

In order to further minimize the potential for impacts to state-listed avian species, construction would be timed to avoid the breeding and nesting seasons for these species. The exact windows of avoidance would be determined through coordination with USFWS and NYSDEC and included in the project plans.

Following construction, temporary impact areas and associated habitats would be immediately and fully restored to their pre-existing conditions. No impacts are anticipated to State-listed avian species resulting from operation of the proposed Force Main. Based on the potential for temporary construction impacts to individuals, the proposed project alternatives may affect, but are not likely to adversely affect, the state-listed threatened pied-billed grebe, sedge wren, Henslow's sparrow, bald eagle, or Northern Harrier. This determination is appropriate when the proposed project is likely to cause insignificant, discountable, or wholly beneficial effects to individuals of listed species.

No effects are anticipated to the State-listed endangered bog turtle or eastern massasauga rattlesnake, neither of which is anticipated to be present in the proposed project area. This determination is appropriate when the proposed project would not directly or indirectly affect (negatively or beneficially) individuals or designated critical habitats. Please refer to Table 4 below.

Table 4 - State Listed Species Impacts/Mitigation Summary

Species	State Listing Status	Description of Activities with Potential Impacts to Habitat or Individuals	Mitigation Measures	Effect Determination
Pied-billed grebe	Threatened	Potential for temporary habitat avoidance, habitat loss, noise disturbance, dust generation, exposure to contaminants, and/or injuries due to construction vehicle collisions during construction on the INWR/TWMA lands. Once the system is operational, no impacts are anticipated.	Route siting along previously disturbed roadway corridors to minimize habitat loss and fragmentation. HDD installation to minimize wetland habitat disturbances in INWR/TWMA. Avoidance of construction during breeding and nesting season for these species; full restoration temporary impact areas within INWR/TWMA immediately following construction.	Both build alternatives may affect, but are not likely to adversely affect, the pied-billed grebe, sedge wren, Henslow's sparrow, bald eagle, and northern harrier.
Sedge wren	Threatened			
Henslow's sparrow	Threatened			
Bald eagle	Threatened			
Northern harrier	Threatened			
Bog turtle	Endangered	None anticipated – habitat and species not expected to be present.	None	No effect
Eastern massasauga	Endangered			No effect

3.11 Other Avian Species

The proposed project is located within the Atlantic Flyway migration corridor of North America (NWF, 2017). To determine the presence of bird species that may occur within the proposed project area, information provided by USFWS and NYSDEC regarding avian species at the INWR and TWMA/Oak Orchard WMA were reviewed, as were the New York State Natural Heritage Program (NHP) and the North American Breeding Bird Survey (BBS) databases.

The INWR serves primarily as a nesting, feeding, resting and staging area for migratory waterfowl. The varied habitats – including emergent marsh, forested wetlands, and grassland habitat types – support approximately 268 species of birds (USFWS, 2017). Of the 268 species, 125 species are known to nest on

or near the INWR (USFWS, 2007). The primary purpose of the TWMA is wildlife management, wildlife habitat management, and wildlife-dependent recreation. The TWMA is used extensively by nesting waterfowl and as a resting and feeding area for migratory birds during spring and fall migration. Upwards of 100,000 geese and thousands of ducks rely on these habitats (NYSDEC, 2017g).

The BBS is an annual bird survey occurring at the height of the breeding season (June). Coordinated by the US Geological Survey (USGS) Patuxent Wildlife Research Center and the Canadian Wildlife Service, and the National Wildlife Research Center, the BBS has over 4,100 survey routes located throughout Canada and the US. The proposed project area is located between two routes: the Byron Route and the Harris Hill Route. The Byron Route runs north/south in Genesee and Orleans Counties, east of the proposed project area, and has been run for 44 years. The Harris Hill Route runs east/west in Genesee and Erie Counties; the portion within Genesee County is south of the proposed project area. The Harris Hill Route has been run for 11 years. A total of 118 species were identified along both routes (a high of 50 species along the Byron Route and a high of 94 species along the Harris Hill Route, with overlap between the two routes) (Sauer et. al, 2017).

A combined species list was developed, showing all avian species identified along the two BBS routes closest to the proposed project area, as well as the species known to nest on or near the INWR. This totaled 141 species. Of these, 16 species have been identified by New York State as High-Priority Species of Greatest Conservation Need (HP-SGCN) and 17 species have been identified as Species of Greatest Conservation Need (SGCN). Both designations indicate that the status of the species is known and conservation action is needed. HP-SGCN are experiencing a population decline or have identified threats that may put them in jeopardy, and are in need of timely management intervention (within 10 years) or they are likely to reach critical population levels in the State. SGCN are experiencing some level of population decline, have identified threats that may put them in jeopardy, and need conservation actions to maintain stable population levels or sustain recovery (NYSDEC, 2015a). With one exception, all of the HP-SGCN and SGCN in or near the project area are known to nest at the INWR. **Please see Appendix E, Bird and Mammal Species Lists.**

3.11.1 Avian Species Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – Earthwork associated with construction activities for Alternatives A and B has the potential to impact individual nesting birds on the INWR or TWMA resulting from temporary habitat avoidance, temporary habitat loss, noise disturbance, dust generation, exposure to contaminants, and/or injuries resulting from construction vehicle collisions with birds during construction.

As mentioned previously, the segment of Alternative A located within the TWMA is located within a roadway corridor (Lewiston Road) that experiences average daily traffic volumes of just under 2,400 vehicles with a posted speed limit of 40 mph. The segment of Alternative B located within the INWR is located within a roadway corridor (NYS Route 63) that experiences average daily traffic volumes of just under 5,000 vehicles with a posted speed limit of 55 mph. The combined INWR/TWMA/Oak Orchard

Management Areas provide approximately 19,000 acres of protected wetland habitats as well as a variety of other habitat types that support hundreds of nesting birds each spring/summer. Based on the abundant availability of suitable habitat outside of the roadway corridors, it is anticipated that species sensitive to human disturbances would not be nesting immediately adjacent to the roadway corridors and are not likely to be affected by the proposed construction activities.

Coordination would take place with USFWS to determine a construction schedule that would avoid the migratory bird breeding and nesting season in order to minimize impacts to avian species. Following construction, temporary impact areas and associated habitats would be immediately and fully restored to their pre-existing conditions. No long-term impacts are anticipated to avian species resulting from operation of the Force Main. Because potential impacts to avian species are expected to be temporary, minimal in context and intensity, and mitigated, Alternatives A and B are not expected to cause or contribute to significant impacts to avian species.

3.12 Other Wildlife and Habitats

USFWS provides a list of 42 mammal species that have been recorded on the INWR or are known or have existed there. These include one marsupial; four species of moles and shrews; eight species of bats; two species of hares and rabbits; 16 species of rodents; 10 species of carnivores, and one hoofed mammal species (USFWS, 2001). As the TWMA is contiguous to the INWR and also provides a variety of similar habitat types, it is assumed that the same species use the TWMA.

Of the 42 mammal species recorded at the INWR, two bat species have been identified by New York State as HP-SGCN and three bat species have been identified as SGCN. Both of these designations indicate that the status of the species is known and conservation action is needed. HP-SGCN are experiencing a population decline, or have identified threats that may put them in jeopardy, and are in need of timely management intervention (within 10 years) or they are likely to reach critical population levels in the State. SGCN are experiencing some level of population decline, have identified threats that may put them in jeopardy, and need conservation actions to maintain stable population levels or sustain recovery (NYSDEC, 2015a). In addition to the mammal species recorded at the INWR, a variety of reptiles, fish, amphibians, insects and other wildlife species use both the INWR and TWMA habitats.

3.12.1 Other Wildlife and Habitats Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) –The mammals, reptiles, fish, amphibians and insects using the INWR and TWMA habitats would not be impacted on a population level from either proposed alternative. Individuals and habitats located within the proposed construction limits may be temporarily impacted from construction activities, if present. As with avian species, potential temporary construction impacts to wildlife may include temporary habitat avoidance, temporary habitat loss, noise disturbance, dust generation, exposure to contaminants, and/or injuries resulting from collisions with construction vehicles.

Construction activities within the TWMA (Alternative A) or the INWR (Alternative B) are expected to be confined to a period of 8-10 weeks. Following construction, habitats would be fully restored, and species are expected to return to their habitats and continue to thrive. The following BMPs would be used to mitigate impacts to wildlife and habitats:

- Siting the proposed infrastructure along previously disturbed roadway corridors and within existing rights-of-way to minimize habitat loss and fragmentation
- Use of HDD installation in TWMA/INWR to minimize disturbance to wildlife or habitats
- Immediate restoration of hydrology in TWMA/INWR by removal of coffer dams once that portion of construction is complete
- Re-grading disturbed areas to pre-construction conditions
- Re-seeding with native seed mix to match surrounding vegetation and pre-construction conditions
- BMPs to reduce the likelihood of invasive species introduction or spread

Past, present, and reasonably foreseeable future actions that affect wildlife habitats within the TWMA and INWR are primarily associated with management activities intended to protect and enhance habitats for the benefit of wildlife species. The potential impacts to wildlife and habitats associated with Alternatives A and B are minor in context and intensity, temporary, and would be mitigated; neither alternative is expected to cause or contribute to significant cumulative impacts to wildlife and habitats either positively or negatively.

3.13 Cultural Resources

In accordance with 16 USC, 470hh(a), information concerning the nature and location of archaeological resources and traditional cultural properties, and detailed information regarding archaeological and cultural resources, is confidential. Such information is exempt from the Freedom of Information Act and are not included in this EA.

3.13.1 Cultural Resources Impacts/Mitigation

Alternative A (No Action) – If Alternative A were selected as the preferred alternative, the need for cultural resource surveys and Section 106 consultation with SHPO would be identified.

Alternative B (Applicant Preferred Action) – An Application for Permit for Archaeological Investigations was approved by USFWS, and Deuel Archaeology completed a Phase I survey and report for the proposed disturbance areas located within the INWR along approximately 4,351 linear meters (14,275 linear feet) where proposed sewer main will be installed via directional drill. Based on Phase IA background research, the project area is considered to have a high degree of archaeological sensitivity for precontact sites and a moderate degree of sensitivity for historic sites in undisturbed contexts. During the Phase IB field investigation, 182 shovel test pits (STPs) were excavated at 8-meter (26.2-foot) intervals in the 27 directional drill staging areas. Photographs were taken to show general field conditions, field methodology, prior ground disturbances, standing water, and the stratigraphy of the STPs. No cultural

resources eligible for the State or National Registers of Historic Places were identified. No further archaeological investigation is recommended for the sewer project within the INWR. The Phase I report was reviewed by Amy Wood, Regional Historic Preservation Officer for USFWS. Ms. Wood supported the findings and recommendation in an email dated April 18, 2018.

The proposed project, including both Alternatives A and B, has been designed in accordance with comments from the Tonawanda Seneca Nation. The Nation has been consistent in supporting off-Site wastewater solutions that do not involve Whitney Creek and Tonawanda Creek, both of which flow through Nation Territory. Both Alternatives avoid involvement of these two waterways addressing the Nation's concerns about the impacts of the development of the STAMP Site on the Nation and its people and culture. Most recently, Nation representatives have raised the issue that the Nation's Territory should be considered a Traditional Cultural Property (TCP) eligible for listing on the National Register of Historic Places.

3.14 Public Health and Safety

Public health and safety concerns associated with this type of development include the potential for a drilling fluid leak during HDD construction.

3.14.1 Public Health and Safety Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – Alternatives A and B have been developed in coordination with the general public and public agencies to ensure positive public health and safety outcomes. Transporting treated effluent generated at the STAMP site to a surface water discharge point eliminates risk of contamination by raw sewage should there be any unanticipated leaks. Alternative B (Applicant Preferred Action) has been identified as the preferred alternative because it provides additional public benefits associated with a shorter route (which creates fewer impacts to public resources) and cost-savings.

HDD techniques, which would be used to drill beneath existing roadways, streams, wetlands, and the TWMA or the INWR to reduce impacts, require the use of drilling fluid to keep the drilling head cool, stabilize the bore hole and lubricate the pipe during pulling operations. The drilling fluid is made from mixing bentonite and other additives with water to produce a slurry that can be pumped. Rarely, an inadvertent release of drilling fluid can occur during the HDD process. Drilling fluid seepage is generally the result of pressurization of the drill hole beyond the containment capability of the overburden soil material or as a result of fractures in the rock, low density soils or unconsolidated soils. Providing adequate depth of cover for the installation of the pipe reduces this potential.

The contractor would control the fluid injection rate and actively monitor the fluid levels at the entrance and exit points during the HDD process. The staging areas would contain temporary fluid containment areas which would provide early indications of fluid encroaching on the surface. The HDD operations would have equipment to contain the fluid in the event that the fluid broke initial containment including

excavation and vacuum abilities (back hoes and vacuum trucks). If the fluid began to encroach the surface, drilling operations would be immediately suspended until fluid containment is regained.

Potential public health and safety impacts resulting from a leak of effluent once the Force Main is operational are not anticipated. The entire length of the Force Main would be pressure tested to ensure there are no leaks prior to placing it into service. An operations and maintenance company would monitor the flows entering and exiting the TWMA or the INWR weekly to ensure that there are no leaks. In the event that a leak occurred, all pumping operations would be stopped and NYSDEC or USFWS would be immediately notified. The immediate upstream and downstream main line valves would be closed to isolate the leak and reduce the amount of fluid flowing to the leak area. The Force Main would be repaired by excavating down to the damaged area, replacing the damaged pipe and installing the necessary repair fittings. A written Emergency Response Plan to address any potential leaks has been developed and is provided with the Engineering Report in Appendix A. The Emergency Response Plan will be included as part of the Operations and Maintenance Manual for the system.

The proposed project is not anticipated to cause or contribute to significant cumulative impacts to public health and safety, when viewed in combination with other past, present, or reasonably foreseeable future actions affecting public health and safety.

3.15 Visual/Aesthetics

The visual landscape in the segments of the TWMA and INWR under consideration includes roadway rights-of-way surrounded by protected natural areas.

3.15.1 Visual/Aesthetic Impacts/Mitigation

Alternative A (No Action) and Alternative B (Applicant Preferred Action) – The Force Main that would be installed under both project alternatives would be buried 5 to 6’ beneath the ground surface and would not have any visual impacts. Ancillary infrastructure that would remain above ground in the TWMA/INWR is described below. These components are minimal and, with the exception of the pipeline markers which are intended to be easily seen, would be camouflaged to minimize visual intrusions on the landscape. No indirect or cumulative impacts to the visual environment are anticipated. **Please refer to Table 5.**

Table 5 - Proposed Project Components Located Above Ground

Item	Description	# in TWMA	# in INWR
Metering manholes	Buried with the exception of 24” diameter cast iron cover visible at surface. Surrounding area graded and restored following construction.	2	2
Maintenance manholes	Buried with the exception of 24” diameter cast iron cover visible at surface. Surrounding area graded and restored following construction. At some locations, a 2” diameter candy-cane shaped pipe would extend 2’ above surface for venting; the pipe would be painted to blend in with surroundings.	15	12

Table 5 - Proposed Project Components Located Above Ground			
Item	**Description**	**# in TWMA**	**# in INWR**
Main line valves	Buried with exception of 8" diameter cast iron valve box cover, installed level with finished grade.	30	27
Pipeline markers	Fiberglass markers 4" wide and 5' above ground.	15	14

3.16 Socioeconomics

Socioeconomic conditions depend on the character, habits, and economic conditions of people living within the proposed project area. Business, employment, transportation, utilities, etc. are factors that affect the social climate of a community. Other factors that distinguish the social habits of one particular area from another include the geography, geology and climate. Any project that would adversely or beneficially affect the factors listed above would have a social impact on the residents of a particular community.

3.16.1 Socioeconomics Impacts/Mitigation

The proposed project will benefit the socioeconomics of the local community and region and provide improved infrastructure and amenities to residents in the proposed project area. At full build-out, STAMP is expected to provide more than 9,000 new jobs to our region, result in water and wastewater utilities for communities in the Towns of Alabama and Oakfield, and result in significant community development.

Alternative B (Preferred Alternative) will provide these benefits at a significantly lower cost ($3.6 million less than Alternative A) and take approximately eight weeks less time to implement.

3.17 Resources that would be Unaffected by Project Alternatives

NEPA and CEQ regulations direct agencies to "avoid useless bulk…and concentrate effort and attention on important issues" (40 CFR 1502.15). The following resources or impact categories may be relevant to other proposals or projects, but are not relevant to the alternatives being considered in this EA.

3.17.1 Geological Setting

The proposed project areas traverse multiple geological units, beginning at the southern end of the project with the Camillus, Syracuse, and Vernon Formations (consisting of shale and dolostone); then passing through a linear band of Ilion Shale, then a very narrow segment of Decew Dolostone and Rochester Shale, and finally terminating in the Medina Group (consisting of sandstone and shale) (USGS, 2017). Neither of the alternatives being considered would affect the geological setting.

3.17.2 Climate and Climate Change

According to the Northeast Regional Climate Center (NRCC), data collected at the Ridgeway weather station (located just north of Medina) reported average temperatures below 25 degrees Fahrenheit in the coldest months and over 70 degrees Fahrenheit in the summer months. The area receives an average of 31.72 inches of precipitation annually, distributed fairly consistently throughout the year. The area

historically receives an average of 61" of snowfall from October through April, with more than two-thirds of that in December – February (NRCC, 2017).

Neither of the alternatives evaluated in this EA would affect the climate in the project area or influence climate change.

3.17.3 Environmental Justice

U.S. Census data were reviewed for Genesee County, Orleans County, the Town of Alabama, Town of Shelby and the Village of Medina. None of these locations had minority or poverty populations that approached or exceeded the thresholds for being considered environmental justice populations (US Census Bureau, 2017). Therefore, environmental justice is not relevant to the proposed action and will not be evaluated further.

3.17.4 Air Quality

In accordance with the federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of criteria pollutants in the atmosphere. The air quality in a region is as result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of a topological "air basin," and the prevailing meteorological conditions.

Under the CAA, the United States Environmental Protection Agency developed numerous concentration-based standards, or National Ambient Air Quality Standards, that represent the maximum allowable concentrations for sulfur dioxide (SO_2), particulate matter (PM), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), and carbon monoxide (CO).

In New York State, air pollution is tracked through the New York State Department of Environmental Quality's air quality monitoring network. The New York State Ambient Air Quality Report for 2015 identified that air quality standards for all criteria pollutants were met in Region 8, which is where the proposed action is located (NYSDEC, 2015b). Neither of the proposed alternatives being considered in this EA would result in air quality impacts. Both project alternatives would have the potential for obnoxious odors associated with air releases; however, no air permit would be necessary.

3.17.5 Farmlands

There are no farmlands located within the TWMA or INWR boundaries. Farmlands do occur along both Alternative A and B routes within Genesee and Orleans Counties, including farmlands in Agricultural Districts; however, these are outside of the project segments being evaluated in this EA. Approval from the New York State Department of Agriculture and Markets would be required for the proposed project prior to construction, and the proposed project would meet a variety of minimum design standards to minimize or mitigate farmland impacts.

3.18 Summary

Please see the table in Appendix F for a summary of environmental impacts and mitigation associated with both project alternatives. Alternative A (No Action) impacts to several resources are anticipated to

be greater than those associated with Alternative B (Applicant Preferred Action). **Please see Appendix F, Summary of Environmental Impacts and Mitigation.**

3.19 Permits and Approvals

Table 6 - Permits and Approvals Needed for Alternative B – Applicant Preferred Action

Permit/Approval Name	Permitting/Approval Agency	Reason for Permit or Approval	Anticipated Schedule for Obtaining Permit/Approval
Nationwide Permit 12 – Utility Line Activities and/or Individual CWA Section 404 Permit	USACE	Construction of Force Main beneath USACE-jurisdictional wetlands and WOUS; temporary and permanent impacts to USACE-JD wetlands and WOUS.	TBD
Clean Water Act Section 401 Water Quality Certification	NYSDEC	Water quality certification associated with the NWP 12 and/or Individual 404 Permit	TBD
Article 24 – Freshwater Wetlands Permit	NYSDEC	Unavoidable impacts to NYSDEC-regulated wetlands	TBD
Section 106 Compliance	NYS SHPO	Proposed federal action (approval of INWR ROW) triggers NHPA compliance	Spring 2018
Highway Work Permit	NYSDOT	Work along and within NYSDOT rights-of-way	TBD
Highway Permit	Town of Alabama Planning Board	Main pump station building	TBD
Highway Permit	Town of Shelby Planning Board	Intermediate pump station building	TBD
Ag & Markets	NYS Department of Agriculture and Markets	Impacts to farmlands enrolled in Agricultural Districts	TBD
Floodplain	Local floodplain administrator	Construction in mapped floodplain	TBD

Chapter 4 Preparers and Public Coordination

4.1 Introduction

This chapter identifies the names and qualifications of the principal people contributing information to this EA. In accordance with Part 1502.6 of the CEQ regulations for implementing NEPA, the efforts of an interdisciplinary team comprising technicians and experts in various fields were required to accomplish this study.

This chapter also provides information about public coordination in development of this EA.

4.2 Preparers

Table 7 - Preparers

Name	Title	Affiliation	Project Role
Thomas Roster	Refuge Manager	INWR	EA review
Mark Masse	Senior Vice President of Operations	Genesee County Economic Development Center	Project development, EA review
Adam Walters	Partner	Phillips Lytle	Legal sufficiency review
Sheila Hess	Principal Ecologist/CEO	CC Environment & Planning	Field resource surveys, impact assessment, agency coordination, EA coordination and review
Jason Foote, P.E.	Senior Associate	Clark Patterson Lee	Project Manager, alternatives development
Tom Carpenter, P.E.	Principal	Clark Patterson Lee	EA review
Andrew Kosa, P.E.	Project Manager	Clark Patterson Lee	EA review
Dan Insinna	Civil Engineer	Clark Patterson Lee	GIS mapping and data collection
Charlotte Brett	Environmental Planner	Independent Consultant	Principal author, data collection, impact assessment
Jeremy D. Deuel	Principal Investigator/Owner	Deuel Archaeology	Cultural resource surveys

4.3 Public Coordination

A 30-day public review and comment period will be provided for this EA.

Chapter 5 References

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Figures

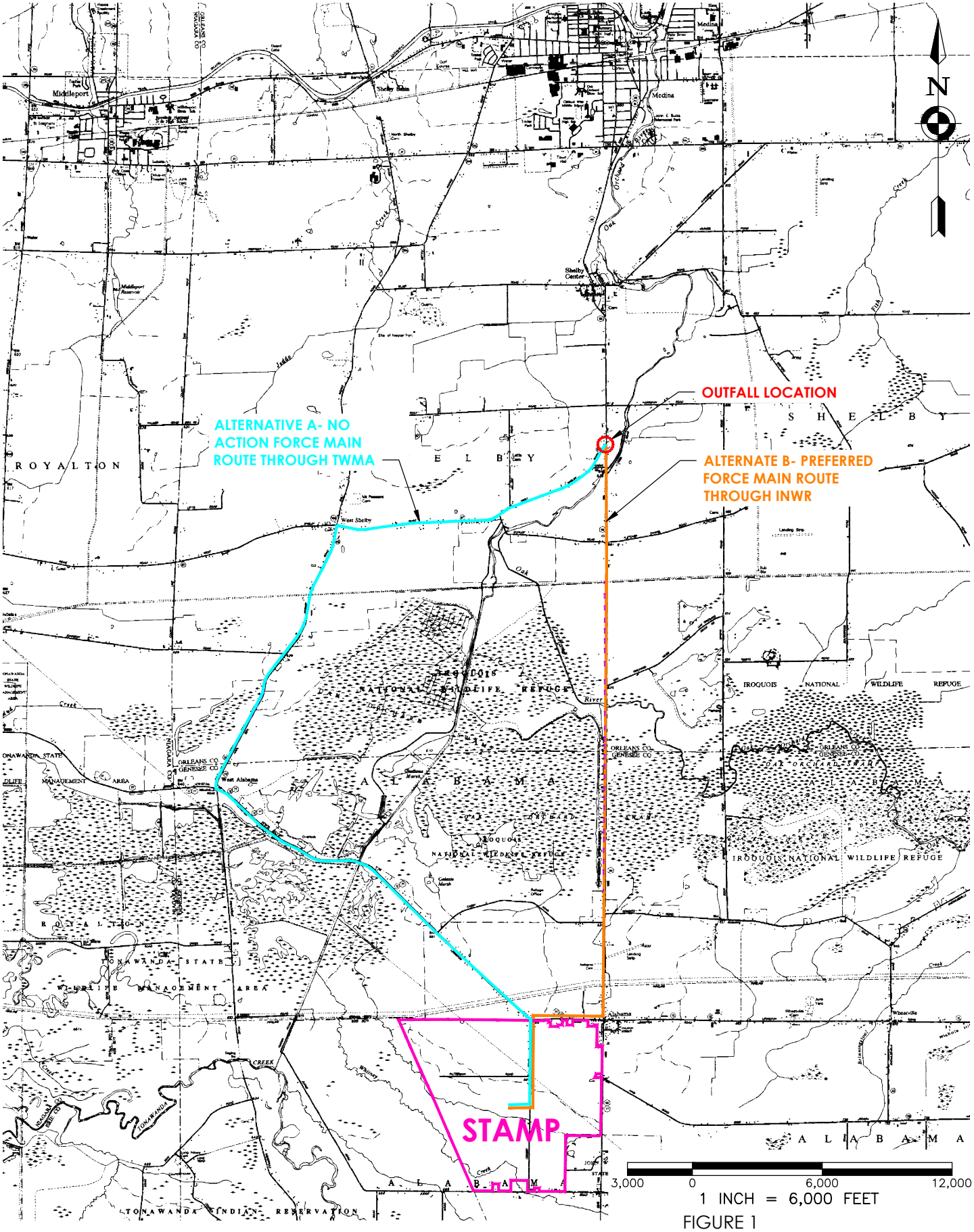


FIGURE 1

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FAX (585) 232-5836
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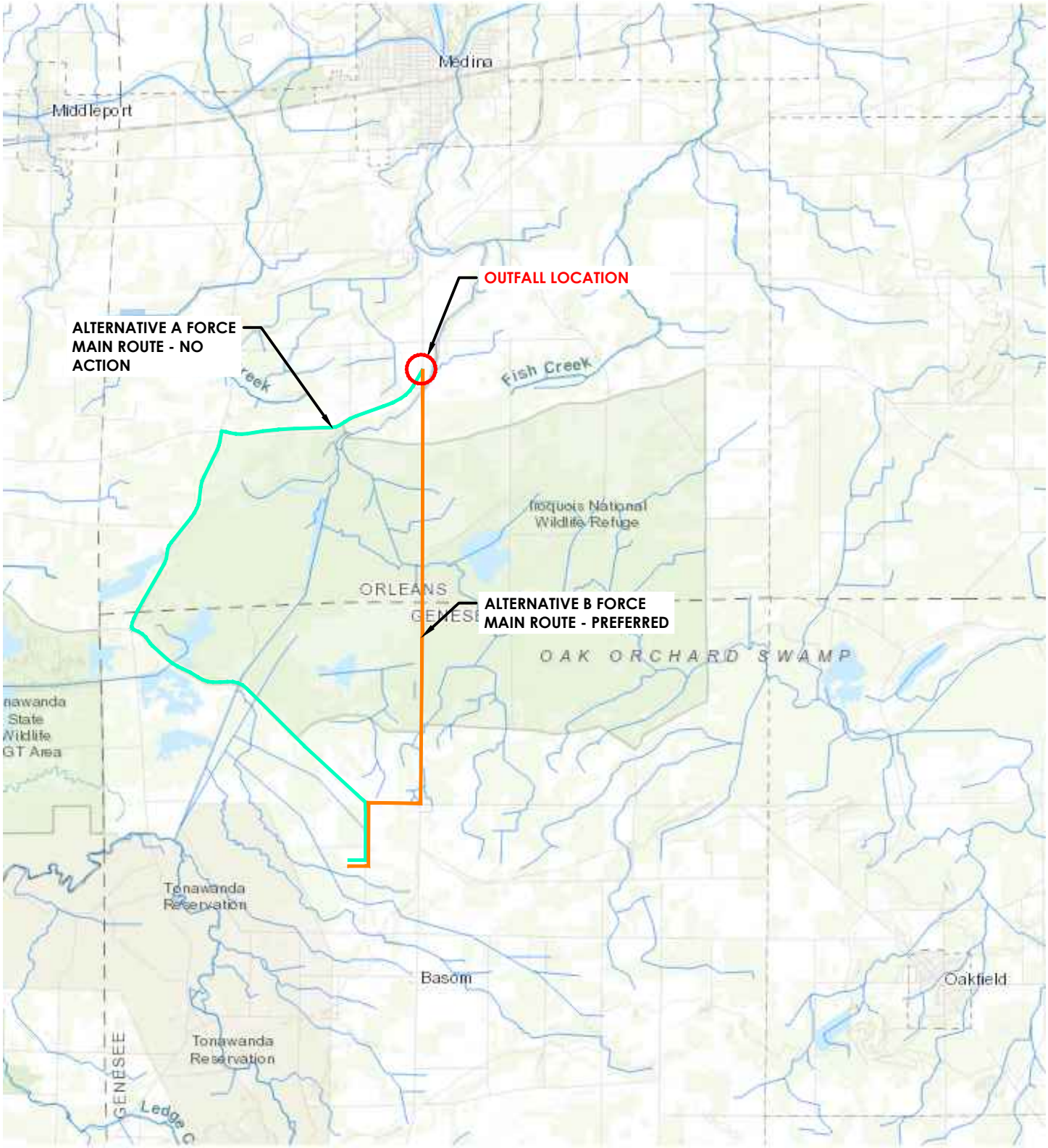
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PROJECT AREA

STAMP OFFSITE SANITARY AND PROCESS WASTEWATER SEWER FORCE MAIN

TOWN OF ALABAMA, NEW YORK

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Date last plotted: 7/25/2018 9:39 AM
Date last accessed: 7/25/2018 8:28 AM
Referenced Drawings: None
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Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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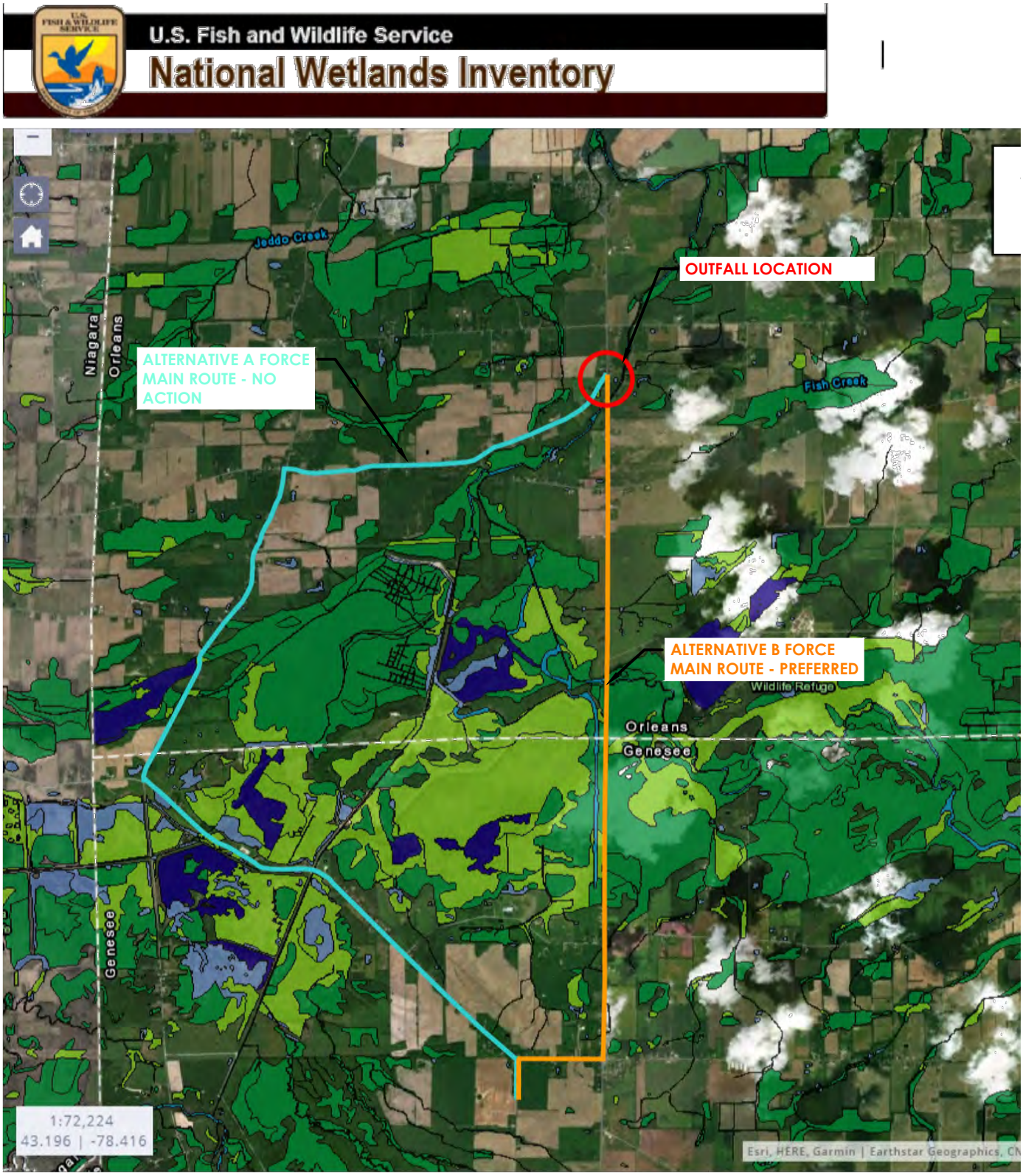
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SURFACE WATER

STAMP OFFSITE SANITARY AND PROCESS WASTEWATER SEWER FORCE MAIN

TOWN OF ALABAMA, NEW YORK STATE

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April 19, 2017 **CATEGORIES OF WETLANDS**

1	Estuarine and Marine Deepwater	4	Freshwater Forested/Shrub Wetland	7	Other
2	Estuarine and Marine Wetland	5	Freshwater Pond	8	Riverine
3	Freshwater Emergent Wetland	6	Lake		

FIGURE 3

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ROCHESTER, NEW YORK 14604
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NWI WETLANDS

STAMP OFFSITE SANITARY AND PROCESS WASTEWATER SEWER FORCE MAIN

TOWN OF ALABAMA, NEW YORK STATE

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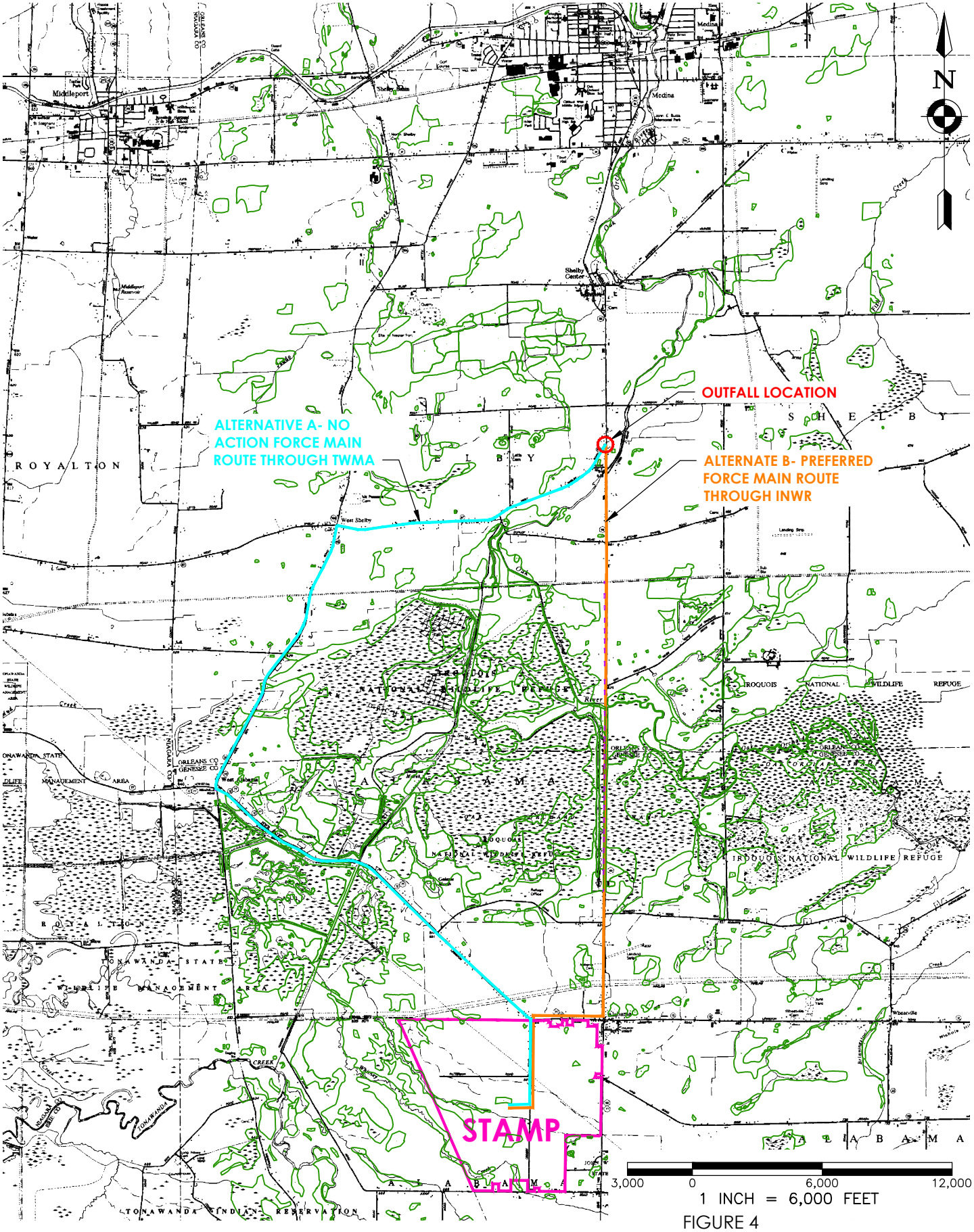


FIGURE 4

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NYSDEC REGULATED WETLANDS

STAMP OFFSITE SANITARY AND PROCESS WASTEWATER SEWER FORCE MAIN

TOWN OF ALABAMA, NEW YORK

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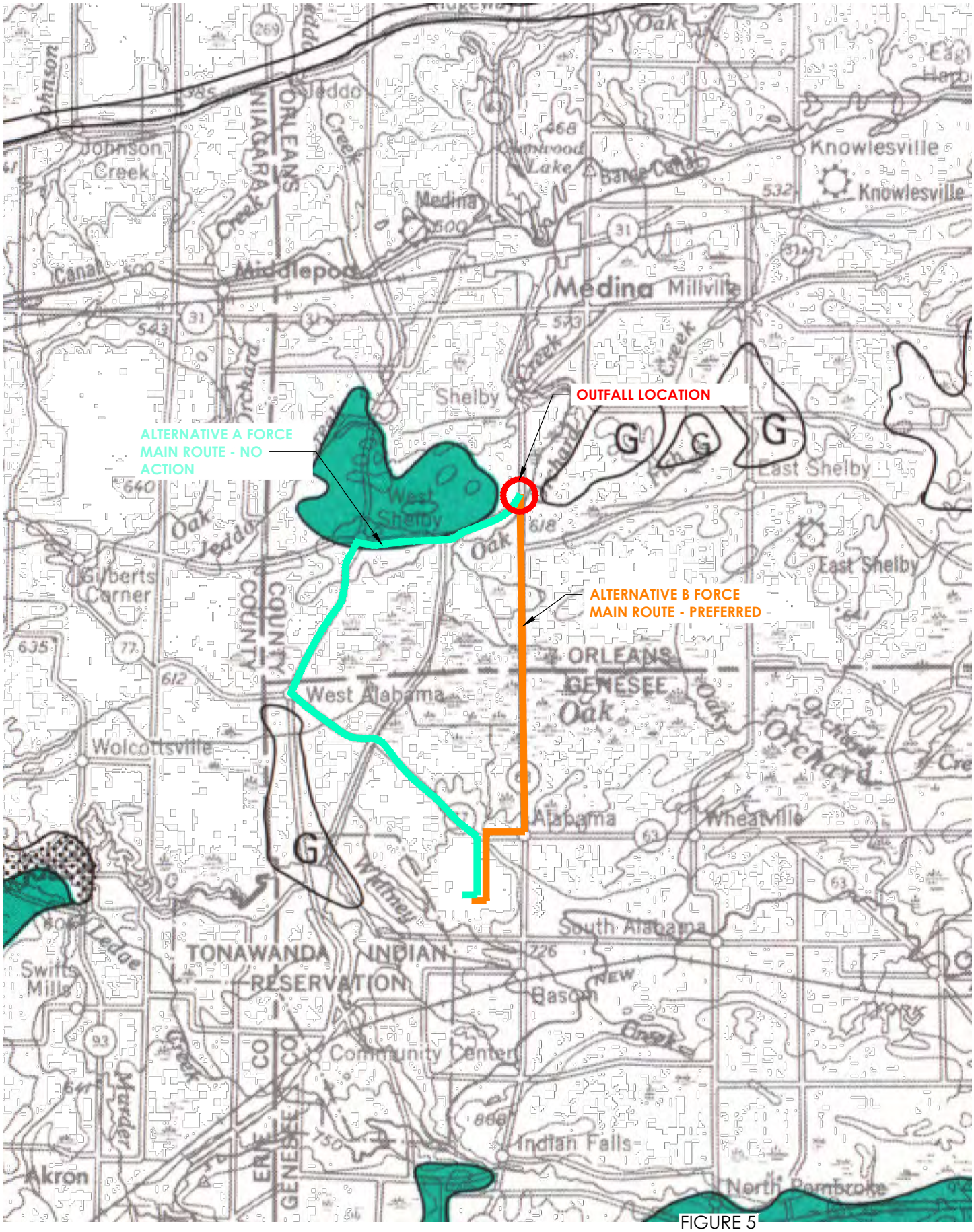


FIGURE 5

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GROUNDWATER MAP

STAMP OFFSITE SANITARY AND PROCESS WASTEWATER SEWER FORCE MAIN

TOWN OF ALABAMA, NEW YORK STATE

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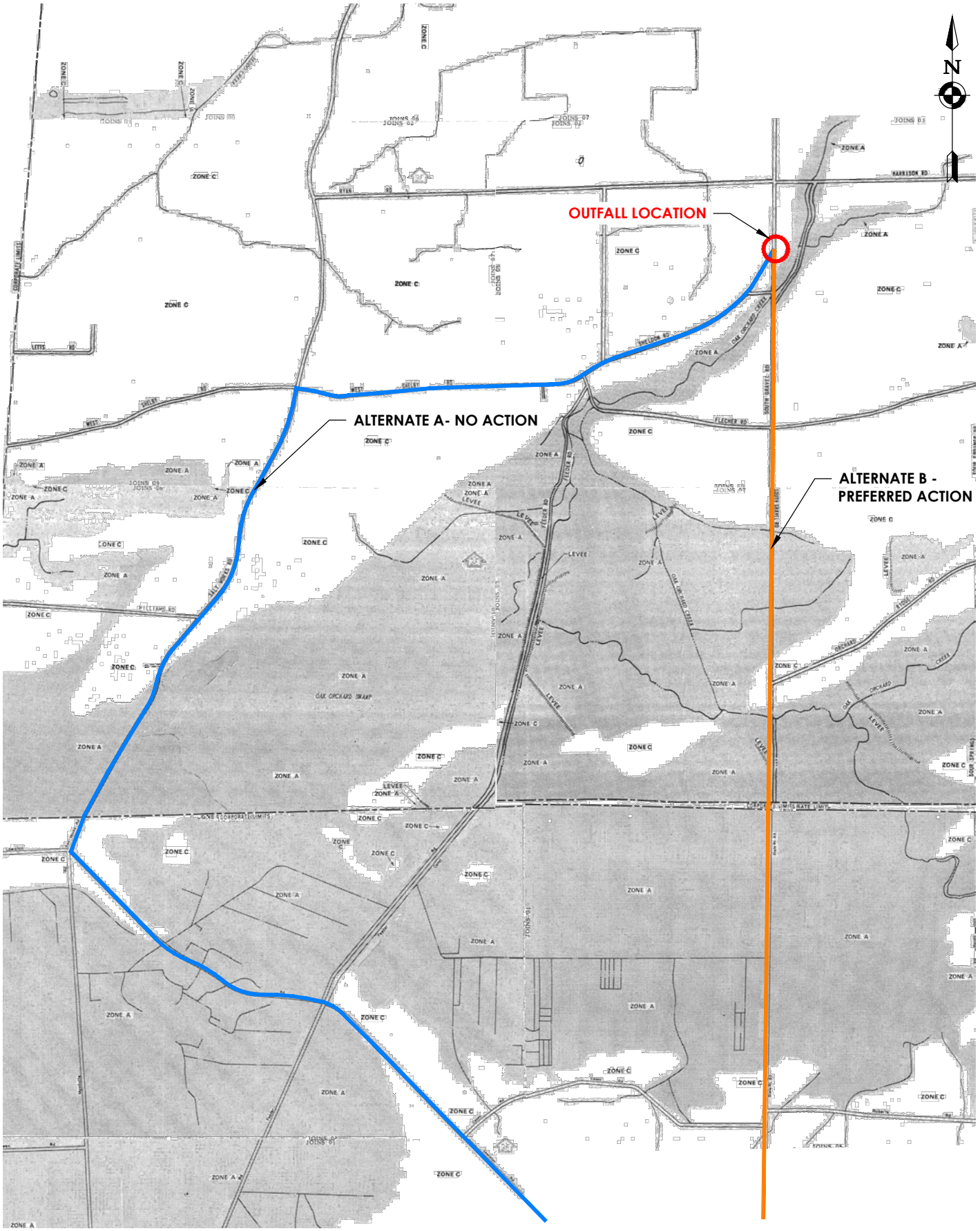


FIGURE 6

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FLOODPLAINS

STAMP OFFSITE SANITARY AND PROCESS WASTEWATER SEWER FORCE MAIN

TOWN OF ALABAMA, NEW YORK STATE

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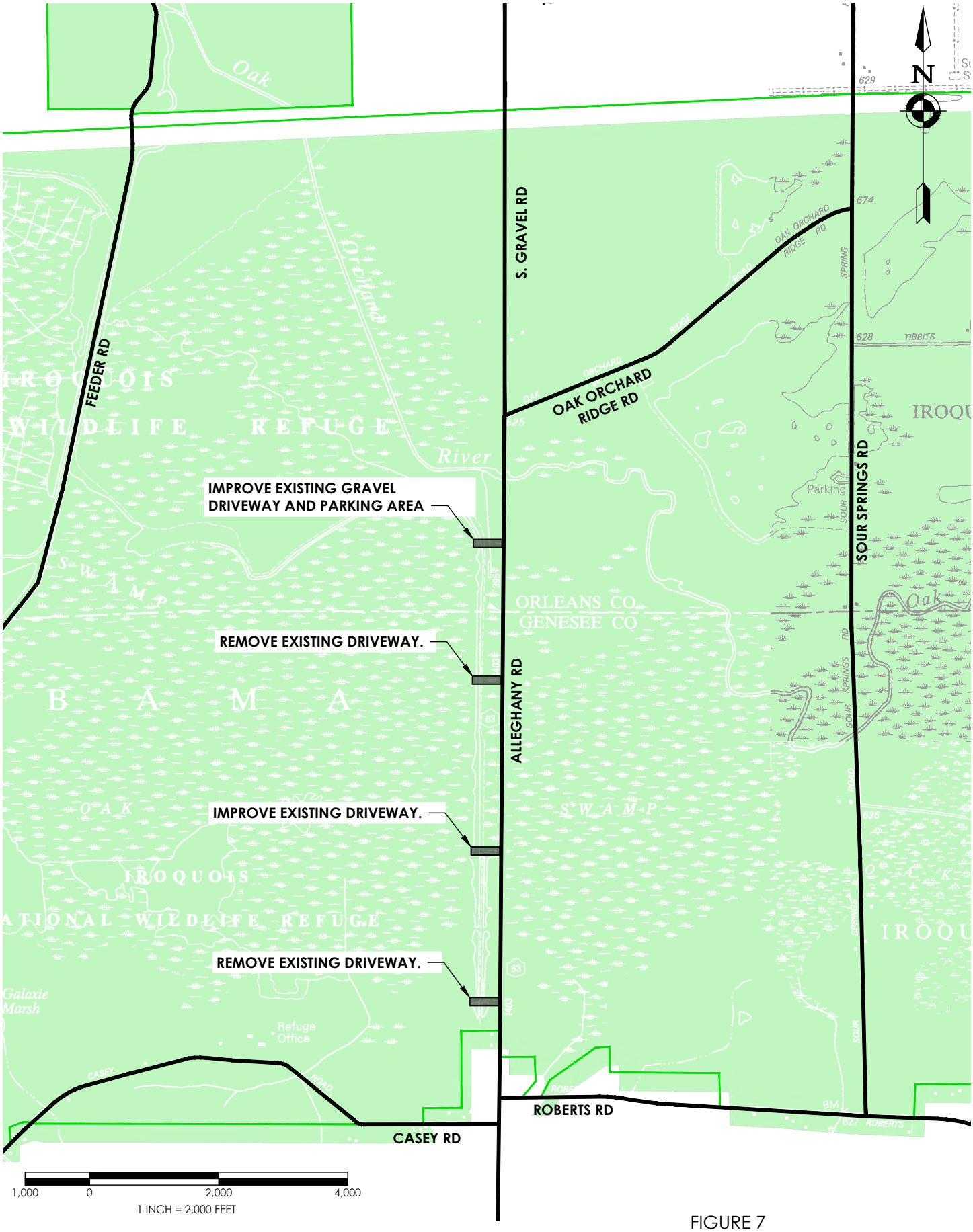


FIGURE 7

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INWR ENHANCEMENT MAP

PROJECT TITLE

CITY, STATE

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Appendix A

Engineering Report

[Under Separate Cover]

Appendix B

Features and Assumptions Common to both Alternatives

Features and Assumptions Common to Both Alternatives

The following features would be common to both Alternative A (No Action) and Alternative B (Applicant Preferred Action) (CPL, 2017). Additional details are in the Engineering Report in Appendix A:

- **Project termini** – both alternatives would convey effluent from the Main Sanitary Pump Station located at the utility area within the Site to a surface water discharge point on Oak Orchard Creek approximately 4.8 miles north of the Hamlet of Alabama.
- **Force main pipe** – both alternatives would use a combination of 18" diameter PVC and 20" HDPE Force Main pipe. Both proposed alternatives would be designed to accommodate up to a maximum of approximately 6 MGD of effluent, with approximately 100,000 gallons per day expected initially. The HDPE pipe would be installed at a 1.0% slope. The Force Main pipe would be installed sloping up and down along the route in order to provide designated high points. The Force Main pipe would be installed with a minimum depth of cover of 5' for all areas, except under stream and creek channels where it would be installed 6' below the channel bottom.
- **Flow meters** – A 12" magnetic flow meter, located on the discharge piping within the new Main Pump Station building, would monitor the instantaneous and total flows exiting the STAMP Site under both alternatives. Additionally, separate insertion type flow meters would be used at the points where the Force Main enters and exits the INWR (in the case of Alternative B – Applicant Preferred Action) or the TWMA (in the case of Alternative A – No Action). The instantaneous and average daily flows from these meters would be compared to those from the main meter to ensure that the Force Main is not leaking with the INWR/TWMA. A written Emergency Response Plan to address any potential leaks has been developed and will be included as part of the Operations and Maintenance Manual for the system. The metering manholes would be completely buried with the exception of the 24" diameter cast iron frame and cover, used to access the meter. In order to prevent water from entering the manholes, the elevation of the cover would be above the high water level of the INWR/TWMA, which in some cases may be above the centerline of the existing roadway. In areas where the cover is above the existing normal ground elevation, the area surrounding the manhole could be graded and naturally restored to camouflage the structure from the surrounding area.
- **Maintenance manholes** – Maintenance manholes would be installed at each high point along the route of the Force Main to provide access to required air releases. Each manhole would be a 6' diameter precast concrete structure containing an internal access ladder, a removable section of 18" pipe, air release/vacuum breaker valve, and vent piping. Air-release/vacuum breaker valves are required to prevent air from becoming captured inside the Force Main pipe, which causes flow constriction and results in poor pumping efficiencies. The removable fitting provides a means to access the Force Main for flushing, testing and bypass pumping purposes. The fitting would consist of a 24" long straight section of 18" diameter ductile iron pipe that could easily be removed for the attachment of other fittings, testing equipment or bypass pumps. Each manhole would also have a 24" diameter case iron manhole cover placed on top for access to the internal components. The cover would be installed so it is level with the finish grade and placed on top of the pipe for access. Since some of the maintenance manholes would be in areas where the high

water level of the INWR (for Alternative B – Applicant Preferred Action)/TWMA (for Alternative A – No Action) would be above the elevation of the air release/vacuum valve, the air release/vacuum breaker piping would extend above grade to ensure the air release valve vented the air properly. For these locations, a 2" diameter galvanized steel vent in the shape of a candy cane that extends approximately 2' above the high water level would be required. The vent would contain a screen over the end of the pipe to prevent animals from entering the vent piping. The piping would be painted to blend in with the surroundings.

- **Main line valves** - The Force Main would require numerous main line valves along the route from the STAMP Site to the Village of Medina. A valve would be located on each side of the maintenance manholes and both of the metering manholes. The valves would provide a means to isolate sections of the Force Main for testing and maintenance purposes. Each valve would require a cast iron valve box, installed to finish grade, for access to the valve's operating unit. The top of the valve box would be approximately 8" in diameter and installed level with the finish grade.
- **Force main markers -** Fiberglass pipeline markers would be placed at periodic intervals along the entire Force Main route. Each marker would be approximately 4" wide and extend 5' above grade. The markers would be used to help identify the location of the underground pipe, especially during the winter months and within heavily vegetated areas.
- **Construction methods** – Open cut construction methods which are located outside of INWR, would be used for lawn and field areas, which form the majority of the route for both alternatives. HDD methods would be used to avoid or minimize impacts at all roadway crossings, wetlands, streams, and within the INWR/TWMA. Erosion and sediment control would be used during construction.
- **Temporary staging areas within INWR/TWMA** – Due to equipment limitations, it is not possible or practical to complete the entire segments in the INWR (for Alternative B – Applicant Preferred Action) or TWMA (for Alternative A – No Action) using a single HDD setup. Based on existing soils conditions and physical limitations with the HDD equipment, each HDD setup would be no longer than 1,000'. Therefore, the proposed crossing of the INWR would be completed using multiple separate and shorter HDD segments connected together. A temporary staging area is also proposed at the mid-point of the HDD segment in the event that the designated slope of the Force Main could not be properly maintained and had to be excavated. Each HDD segment would require a staging area where the HDD machine and other equipment would be located to complete the drilling process. The two HDD pipe ends would also be joined together within the staging areas. Each staging area would have an exterior dimension of approximately 20' x 60'. Every effort would be made to locate the staging areas within previously disturbed areas to help minimize impacts to the environmentally sensitive areas within the INWR/TWMA. The majority of the staging areas would be located within the existing roadway embankment of NYS Route 63 or Lewiston Road, existing access driveways or at higher elevation points. The temporary staging areas would be fully restored following construction.

- **Construction sequencing** - Construction of all temporary staging areas would take place prior to starting the HDD process. The staging areas would be created by importing a clay based subsoil material for the construction of earthen cofferdams around staging areas. The subsoil material would originate offsite from a borrow pit and would be screened prior to placement. If necessary, the soil material placed within the water would be adequately compacted to provide a watertight barrier between the INWR/TWMA and the work inside the staging area. The soil imported to construct the cofferdam would be placed at approximately a 1:1 slope with the height of the cofferdam depending on the water level in the area. The height should be at least 1' above the normal water level to prevent water from overtopping the cofferdam and entering the work area. If the normal water level is high and the staging area cannot be relocated or eliminated, the footprint of the staging area may be slightly increased to provide the necessary area for equipment. This increase would not exceed 20' x 60'. There may also be instances where it may not be necessary to import soil for the staging areas located at higher elevations. Staging areas may be left in place for up to 2-3 months while remaining work, Force Main testing and restoration take place. Silt fence or erosion sock would be installed around the entire perimeter of the cofferdam and along the edge of water immediately after it is installed. Erosion controls would be maintained until the cofferdam is removed – once construction is complete – and the area is restored to its original condition. Due to the seasonal high water level in the area, dewatering pumps may be required to remove water seeping into the excavations inside of the staging area. All water pumped from staging areas would be directed to a silt sock located adjacent to the staging area before discharge back into the INWR/TWMA. Once the construction of all the staging areas is complete and all erosion controls in place, a new Force Main would be installed by HDD method between each staging area. Approximately 20 feet of the end of each section would be excavated by open cut method to provide the proper cover and to install the maintenance manhole. Subsurface excavations would be backfilled with the same native material removed from the excavation after work is complete. Topsoil and subsoil would be segregated upon removal and replaced in kind. The excavated areas within driveways would be backfilled with select fill material to prevent settlement from vehicles. The open cut portion of the work should take approximately 1 or 2 days to complete for each staging area. Clay plugs would be installed around the Force Main at the limits of the staging areas to help prevent the migration of water along the outside of the pipe. A temporary shoring system or trench box would be used during the installation of the Force Main and maintenance manhole to provide a safe area for workers, as required by the New York State Department of Transportation (NYSDOT) and Occupational Safety and Health Administration (OSHA); all shoring would be removed upon completion of the work.

Appendix C

Soil Types

Soil Types						
Map Unit Symbol	Map Unit Name	Rating Code[2]	Alternative A		Alternative B	
			Area (in acres)	% of Total Area	Area (in acres)	% of Total Area
AnA	Appleton silt loam, 0 to 3 percent slopes	B/D	0.9	4.5		
Apa	Appleton silt loam, 0 to 3 percent slopes	B/D	0.5	2.4		
ArB	Arkport very fine sandy loam, 1 to 6 percent slopes	A	4.5	23.3		
ArC	Arkport very fine sandy loam, 6 to 12 percent slopes	A	0.4	1.9		
Ca	Canandaigua soils	C/D			1.1	8.0
CaA	Canandaigua silt loam, 0 to 2 percent slopes	C/D	0.2	0.2	0.1	0.8
CbA	Canandiagua mucky silt loam, 0 to 2 percent slopes	C/D	1.2	6.0	2.9	20.7
Cg	Cheektowaga fine sandy loam	C/D			1.0	7.3
ChA	Churchville silt loam, 0 to 2 percent slopes	C/D			0.3	1.8
Cs	Cosad loamy fine sand	C/D			0.1	0.1
ElB	Elnora loamy fine sand, 2 to 6 percent slopes	A/D	1.6	8.4	0.9	6.2
FH	Fluvaquents and Humaquepts, ponded	A/D	0.3	1.8		
Fo	Fonda mucky silt loam	C/D	0.4	1.8		
FpA	Fredon gravelly loam, 0 to 3 percent slopes	B/D	0.4	2.3		
GnA	Galen very fine sandy loam, 0 to 2 percent slopes	A/D	0.5	2.5		
GnB	Galen very fine sandy loam, 2 to 6 percent slopes	A/D	0.1	0.5		
HbB	Hilton loam, 3 to 8 percent slopes	C/D	1.1	5.9		
Ju	Junius loamy fine sand	A/D			0.5	3.5

[2] Group A soils have a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. Group B soils have a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. Group C soils have a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. Group D soils have a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Soil Types						
Map Unit Symbol	Map Unit Name	Rating Code[2]	Alternative A		Alternative B	
			Area (in acres)	% of Total Area	Area (in acres)	% of Total Area
Ld	Lamson very fine sandy loam	A/D	0.6	3.1		
Ma	Madalin silty clay loam, 0 to 3 percent slopes	C/D	1.2	6.1		
MdB	Madrid fine sandy loam, 3 to 8 percent slopes	B	0.5	2.6	0.6	4.2
NgA	Niagara silt loam, 0 to 2 percent slopes	C/D			0.3	2.0
OdA	Odessa silt loam, 0 to 3 percent slopes	D			1.6	11.1
OdB	Odessa silt loam, 3 to 8 percent slopes	D	0.1	0.4	0.7	1.0
OnB	Ontario loam, 3 to 8 percent slopes	C	2.2	11.3		
OvA	Ovid silt loam, 0 to 3 percent slopes	C/D	0.2	1.2	0.2	1.6
Pd	Palms muck	B/D	0.2	0.8	2.7	18.8
Pm	Palms muck	B/D			1.6	11.2
PsB	Phelps gravelly loam, 3 to 8 percent slopes	B/D	0.6	3.4		
Wy	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	B/D	0.4	2.1		

Appendix D

Common Plant Species in Project Area

Commonly Observed Plant Species in Project Area	
Scientific Name	**Common Name**
Acer negundo	Box elder
Acer spp.	Maple
Ageratina altissima	White snakeroot
Ambrosia artemisiifolia	Annual ragweed
Arctium lappa	Common burdock
Artemisia vulgaris	Common wormwood
Ascelpias syriaca	Common milkweed
Calystegia sepium	Hedge bindweed
Cichorium intybus	Chicory
Cornus spp.	Dogwood
Dactylis glomerata	Orchard grass
Dipsacus fullonum	Teasel
Echinocystis lobata	Wild Cucumber Vine
Eupatoruim perfoliatum	Boneset
Eutrochium maculatum	Spotted joe pye weed
Fraxinus pennsylvanica	Green ash
Impatiens capensis	Jewelweed
Juglans nigra	Black walnut
Malus domestica	Apple tree
Mentha arvensis	Wild mint
Parthenocissus quinquefolia	Virginia creeper
Phalaris arundinacea	Reed canarygrass
Phleum pratensis	Timothy
Phragmites australis	Common reed
Polygonum spp.	Smartweeds
Populus deltoides	Eastern cottonwood
Prunus virginiana	Choke cherry
Rhamnus cathartica	Common buckthorn
Rhus typhina	Staghorn sumac
Rosa multiflora	Multiflora rose
Salix spp.	Willow
Solidago spp.	Goldenrod
Symphyotrichum spp.	Aster species
Tilia americana	Basswood
Toxicodendron raicans	Poison ivy
Typha spp.	Cattail
Vitis aestivalis	Summer grape

Appendix E

Bird and Mammal Species Lists

Avian Species Sighted Along Byron (2005-2016) and Harris Hill (1967-2016) BBS Routes and Nesting Species at INWR		
Acadian Flycatcher (A)	Eastern Phoebe (A)	Prothonotary Warbler (A/B)
Alder Flycatcher (A)	Eastern Screech-Owl (A)	Purple Finch (A)
American Black Duck (A/B)	Eastern Towhee (A)	Purple Martin (A)
American Bittern (A/C)	Eastern Whip-poor-will	Red-bellied Woodpecker (A)
American Coot (A)	Eastern Wood-Pewee (A)	Red-breasted Nuthatch
American Crow (A)	European Starling (A)	Red-shouldered Hawk (A/C)
American Goldfinch (A)	Field Sparrow (A)	Red-tailed Hawk (A)
American Kestrel (A/C)	Gadwall (A)	Red-winged Blackbird (A)
American Redstart (A)	Golden-crowned Kinglet (A)	Ring-billed Gull
American Robin (A)	Golden-winged Warbler (A/B)	Ring-necked Pheasant (A)
American Wigeon (A)	Grasshopper Sparrow (A/B)	Rock Pigeon (A)
American Woodcock (A/C)	Gray Catbird (A)	Rose-breasted Grosbeak (A)
Bald Eagle (A/C)	Great Blue Heron (A)	Ruby-throated Hummingbird (A)
Baltimore Oriole (A)	Great Crested Flycatcher (A)	Ruffed Grouse (A/C)
Bank Swallow	Great Horned Owl (A)	Savannah Sparrow (A)
Barn Swallow (A)	Green Heron (A)	Scarlet Tanager (A/C)
Barred Owl (A)	Green Winged Teal (A)	Sedge Wren (A/B)
Belted Kingfisher (A)	Hairy Woodpecker (A)	Sharp-shinned Hawk (A)
Black Tern (A/B)	Henslow's Sparrow (A/B)	Song Sparrow (A)
Black-and-white Warbler	Hooded Merganser (A)	Sora (A)
Black-billed Cuckoo (A/C)	Hooded Warbler (A)	Spotted Sandpiper (A)
Black-capped Chickadee (A)	Horned Lark (A/B)	Swamp Sparrow (A)
Black-throated Blue Warbler (C)	House Finch (A)	Tree Swallow (A)
Black-throated Green Warbler	House Sparrow (A)	Tufted Titmouse (A)
Blue Jay (A)	House Wren (A)	Turkey Vulture (A)
Blue-gray Gnatcatcher (A)	Indigo Bunting (A)	Unid. Eastern/Western Meadowlark
Blue-headed Vireo	Killdeer (A)	Unid. Empidonax Flycatcher
Blue-winged Teal (A/C)	King Rail (A/B)	Upland Sandpiper (A/B)
Blue-winged Warbler (A/C)	Least Bittern (A/C)	Veery (A)
Bobolink (A/B)	Least Flycatcher (A)	Vesper Sparrow (A/B)
Brown Creeper (A)	Mallard (A)	Virginia Rail (A)
Brown Thrasher (A/B)	Marsh Wren (A)	Warbling Vireo (A)
Brown-headed Cowbird (A)	Mourning Dove (A)	White-breasted Nuthatch (A)
Canada Goose (A)	Mourning Warbler (A)	Wild Turkey (A)
Cedar Waxwing (A)	Northern Cardinal (A)	Willow Flycatcher (A)
Cerulean Warbler (A/C)	Northern Flicker (A)	Wilson's Snipe (A)
Chestnut-sided Warbler	Northern Harrier (A/C)	Wood Duck (A)
Chimney Swift	Northern Mockingbird	Wood Thrush (A/C)
Chipping Sparrow (A)	Northern Pintail (A/C)	Yellow-bellied Sapsucker (A)
Cliff Swallow	Northern Rough-winged Swallow	Yellow-billed Cuckoo (A)
Common Gallinule	Northern Shoveler (A)	Yellow-breasted Chat (A/B)
Common Grackle (A)	Northern Waterthrush (A)	Yellow-throated Vireo (A)
Common Moorhen (A)	Orchard Oriole	Yellow Warbler (A)
Common Yellowthroat (A)	Osprey (A)	A = species known to nest on or near INWR
Cooper's Hawk (A)	Ovenbird (A)	
Downy Woodpecker (A)	Pied-billed Grebe (A/C)	

Avian Species Sighted Along Byron (2005-2016) and Harris Hill (1967-2016) BBS Routes and Nesting Species at INWR		
Eastern Bluebird (A)	Pileated Woodpecker (A)	B = NYS High Priority Species of Greatest Conservation Need
Eastern Kingbird (A)	Red-eyed Vireo (A)	C = NYS Species of Greatest Conservation Need
Eastern Meadowlark (A/B)	Red-headed Woodpecker (A/B)	

Mammals Recorded at INWR		
Beaver	Longtail Weasel	Shorttail Weasel
Big Brown Bat	Masked Shrew	Silver-Haired Bat (B)
Bobcat	Meadow Jumping Mouse	Small-footed Myotis
Coyote	Meadow Vole	Snowshoe Hare
Deer Mouse	Mink	Southern Flying Squirrel
Eastern Chipmunk	Muskrat	Starnose Mole
Eastern Cottontail	Northern Flying Squirrel	Striped Skunk
Eastern Gray Squirrel	Norway Rat	Virginia Oppossum
Eastern Pipistrelle (A)	Porcupine	White-footed Mouse
Gray Fox	Raccoon	Whitetail Deer
Hairytail Mole	Red Bat (B)	Woodchuck
Hoary Bat (B)	Red Fox	Woodland Jumping Mouse
House Mouse	Red Squirrel	
Keen Myotis	River Otter	A = NYS High Priority Species of Greatest Conservation Need
Little Brown Myotis (A)	Shorttail Shrew	B = NYS Species of Greatest Conservation Need

Appendix F

Summary of Environmental Impacts and Mitigation

Summary of Environmental Impacts			
Resource/Impact Category	**Alternative A (No Action) Impacts**	**Alternative B (Applicant Preferred Action) Impacts**	**Mitigation**
Land Use	• Majority of route located within existing rights of way to minimize land use impacts. • Approximately 15.7 acres of new right-of-way needed from TWMA, with approximately 0.85 acre of temporary disturbance for construction of HDD staging areas. • No permanent land use changes resulting from Alternative A.	• Majority of route located within existing rights of way to minimize land use impacts. • Approximately 14.3 acres of new right-of-way needed from INWR, with approximately 0.74 acres of temporary disturbance for construction of HDD staging areas. No permanent land use changes resulting from Alternative B.	• Disturbed areas fully restored following construction. • Use of HDD installation methods to substantially reduce disturbance to TWMA/INWR lands as well as streams, wetlands, and roadway crossings. • For Alternative B, improvement of two of the four existing access driveways connecting Route 63 to INWR for habitat management access and parking facilities. Removal of two unused access driveways and restoration of these areas to wetland grade and vegetation.
Soils	• Disturbances to approximately 0.85 acre of soils within the TWMA.	• Disturbances to approximately 0.74 acre of soils within the INWR.	• Use of HDD would minimize impacts by approximately 90% within TWMA and INWR • Erosion and sediment control measures would be implemented during and after construction. • Topsoil would be segregated from subsurface material for future reclamation. • Disturbed areas would be re-seeded using native seed mix consistent with surrounding areas immediately after construction activities are complete. • Appropriately sized construction equipment for the scope and scale of the project would be used. • Proper drainage would be maintained. • Disturbed areas would be re-graded to match original topography following installation of the proposed Force Main.
Surface Water	• 3 stream crossings within the TWMA • None of the streams are “protected waters” of the State; a New York State Protection of Waters permit would not be needed. • Some or all of these streams may be under USACE-JD as WOUS. • NWP 12 – Utility Line Activities and associated CWA Section 401 Water Quality Certification needed for any crossings of WOUS.	• 4 stream crossings within the INWR • None of the streams are “protected waters” of the State; a New York State Protection of Waters permit would not be needed. • Some or all of these streams may be under the jurisdiction of the US Army Corps of Engineers (USACE-JD) as Waters of the US (WOUS). • NWP 12 – Utility Line Activities and associated Clean Water Act (CWA) Section 401 Water Quality Certification needed for any crossings of WOUS.	• HDD methods used to avoid impacts to bed and bank at stream crossing locations.
Wetlands	• Wetland impacts avoided and minimized to the extent feasible. • Unavoidable temporary impacts to approximately 0.61 acres of wetlands in TWMA would occur from construction of staging areas (including cofferdams) to facilitate HDD installation of the proposed Force Main. • Minor permanent impacts (0.07 acre) would result from the installation of main line valves, maintenance an1d metering manholes, and Force Main markers that would remain in place once the new wastewater system was operational.	• Wetland impacts avoided and minimized to the extent feasible. • Unavoidable temporary impacts to approximately 0.50 acres of wetlands in INWR would occur from construction of staging areas (including cofferdams) to facilitate HDD installation of the proposed Force Main. • Minor permanent impacts (0.06 acre) would result from the installation of main line valves, maintenance and metering manholes, and Force Main markers that would remain in place once the new wastewater system was operational.	• Location of the Force Main along and within previously disturbed roadway corridors would lessen impacts to wetlands. • HDD methods would be used to avoid or minimize impacts to wetlands. • Immediate restoration of disturbed sites following construction, including restoration of hydrology, re-grading soils to match original contours, and planting with a native wetland seed mix appropriate to the disturbed wetland type. • A mitigation plan to offset lost functions and values would be developed if needed through coordination with USFWS, USACE, and NYSDEC during the permitting processes. • For Alternative B, restoration of two currently unused access roads would result in restoration of additional wetland habitat.
Groundwater	• No impacts to groundwater are anticipated.	• No impacts to groundwater are anticipated.	• Plan in place in case of drilling fluid leak during construction. Monitoring to ensure any effluent leaks would be quickly identified and fixed.
Floodplains	• Minor impacts (104.4 cubic yards) to the mapped floodplain	• Minor impacts (139.2 cubic yards) to the mapped floodplain	• Coordination with local floodplain administrators required.
Vegetation	• Ground clearing activities would result in approximately 0.85 acre of vegetation disturbance within the TWMA.	• Ground clearing activities would result in approximately 0.74 acre of vegetation disturbance within the INWR.	• Weed-free source will be used for project materials • No topsoil would be brought into the TWMA or INWR • Designated cleaning areas would be used for tools, equipment and vehicles

Summary of Environmental Impacts			
Resource/Impact Category	**Alternative A (No Action) Impacts**	**Alternative B (Applicant Preferred Action) Impacts**	**Mitigation**
			• Tools, equipment and vehicles would be inspected and cleaned before entering the TWMA/INWR • Vegetation disturbances within the TWMA/INWR reduced by 90% through use of HDD construction methods • Erosion control methods implemented during and after construction • Disturbed areas re-seeded with native plant mix appropriate to pre-construction conditions and consistent with surrounding vegetation following construction • Monitoring and maintenance of restored areas for noxious weeds and native plant community establishment for 2 seasons following construction
Noise	• Due to the large amount of high quality habitat for breeding and nesting birds, as well as other wildlife, available at the combined INWR/ TWMA/ Oak Orchard WMA, it is anticipated that noise-sensitive species would not nest in close proximity to Lewiston Road, which has a posted speed limit of 40 mph and average daily traffic volumes of nearly 2,400 vehicles. • Following construction, the Force Main and ancillary infrastructure would not generate noise.	• Due to the large amount of high quality habitat for breeding and nesting birds, as well as other wildlife, available at the combined INWR/ TWMA/ Oak Orchard WMA, it is anticipated that noise-sensitive species would not nest in close proximity to NYS Route 63, which has a posted speed limit of 55 mph and average daily traffic volumes of nearly 5,000 vehicles. • Following construction, the proposed Force Main and ancillary infrastructure would not generate noise.	• Construction avoidance during migratory bird breeding and nesting season, as determined through coordination with USFWS.
Threatened and Endangered Species	• Alternative A may affect, but is not likely to adversely affect, the federally threatened Northern long-eared bat. • Alternative A also may affect, but is not likely to adversely affect, five state-listed threatened species: the pied-billed grebe, sedge wren, Henslow's sparrow, bald eagle, and northern harrier. • Alternative A would have no effect on two state-listed endangered species: the bog turtle or eastern massasauga rattlesnake.	• Alternative B may affect, but is not likely to adversely affect, the federally threatened Northern long-eared bat. • Alternative B also may affect, but is not likely to adversely affect, five state-listed threatened species: the pied-billed grebe, sedge wren, Henslow's sparrow, bald eagle, and northern harrier. • Alternative B would have no effect on two state-listed endangered species: the bog turtle or eastern massasauga rattlesnake.	• No tree removal has been identified for Alternative B. Any necessary tree removal for either Alternative would take place outside the NLEB pup season (June 1 – July 31), and, where possible, within the hibernation period (October 31 – March 31). • Construction avoidance during breeding and nesting season of state-listed avian species, as determined through coordination with USFWS and NYSDEC. • Route siting along previously disturbed roadway corridors to minimize habitat loss and fragmentation. • Full restoration of impacted areas within INWR/TWMA immediately following construction.
Other Avian Species	• Potential for temporary habitat avoidance, habitat loss, noise disturbance, dust generation, exposure to contaminants, and/or injuries due to construction vehicle collisions with birds during construction on the TWMA lands. Once the system is operational, no impacts are anticipated.	• Potential for temporary habitat avoidance, habitat loss, noise disturbance, dust generation, exposure to contaminants, and/or injuries due to construction vehicle collisions with birds during construction on the INWR lands. Once the system is operational, no impacts are anticipated.	• Route siting along previously disturbed roadway corridors to minimize habitat loss and fragmentation. • HDD installation to minimize wetland habitat disturbances in INWR/TWMA • Construction avoidance during migratory bird breeding and nesting season, as determined through coordination with USFWS. • Full restoration of impacted areas within INWR/TWMA immediately following construction. • For Alternative B, restoration of additional wetland habitat with removal of unused access roads.
Other Wildlife and Habitats	• No population-level impacts to mammals, reptiles, fish, amphibians and insects using TWMA habitats. • Individuals and habitats located within the proposed construction limits may be temporarily impacted from construction activities, if present. Construction activities within the TWMA are expected to be confined to a period of 8-10 weeks. Following construction, habitats would be fully restored, and species are expected to return to their habitats and continue to thrive.	• No population-level impacts to mammals, reptiles, fish, amphibians and insects using TWMA habitats. • Individuals and habitats located within the proposed construction limits may be temporarily impacted from construction activities, if present. Construction activities within the INWR are expected to be confined to a period of 8-10 weeks. Following construction, habitats would be fully restored, and species are expected to return to their habitats and continue to thrive.	• Siting the proposed infrastructure along previously disturbed roadway corridors and within existing rights-of-way to minimize habitat loss and fragmentation • Use of HDD installation in TWMA/INWR to minimize disturbance to wildlife or habitats • Immediate restoration of hydrology in TWMA/INWR by removal of coffer dams once that portion of construction is complete • Re-grading disturbed areas to pre-construction conditions • Re-seeding with native seed mix to match surrounding vegetation and pre-construction conditions • BMPs to reduce the likelihood of invasive species introduction or spread.

Summary of Environmental Impacts			
Resource/Impact Category	**Alternative A (No Action) Impacts**	**Alternative B (Applicant Preferred Action) Impacts**	**Mitigation**
Cultural Resources	• Cultural resource surveys and SHPO coordination would be required if Alternative A became the preferred action.	• Cultural resource surveys have been completed for areas proposed for disturbance on the INWR; a no effect determination has been provided by both state and federal review agencies.	• Buffer areas have been designed with additional room to accommodate moving HDD staging areas if needed to avoid cultural resources.
Public Health and Safety	• Low potential for a drilling fluid leak during construction. • Low potential for effluent leak once system is operational.	• Low potential for drilling fluid leak during construction. • Low potential for effluent leak once system is operational.	• HDD fluid injection would be closely controlled and monitored. Temporary fluid containment areas and equipment would be provided on-Site in case they were needed. In the event of a drilling fluid leak, drilling operations would be immediately suspended until fluid containment is regained. • Once the system is operational, it would be monitored weekly at the entrance and exit to the INWR/TWMA to ensure no effluent leaks. In the event that an effluentleak occurred, pumping operations would be stopped and USFWS and NYSDEC notified. The immediate upstream and downstream main line valves would be closed to isolate the leak and reduce the amount of fluid flowing to the leak area. The Force Main would be repaired by excavating down to the damaged area, replacing the damaged pipe and installing the necessary repair fittings.
Visual/ Aesthetics	• Following construction, few visible signs of the proposed project would remain on the landscape. Metering manholes, maintenance manholes, main line valves, and Force Main markers would be located along the route (including in the TWMA), but would be minimal intrusions in the context of the setting and located within/immediately adjacent to the Lewiston Road corridor.	• Following construction, few visible signs of the proposed project would remain on the landscape. Metering manholes, maintenance manholes, main line valves, and Force Main markers would be located along the route (including in the INWR), but would be minimal intrusions in the context of the setting and located within/immediately adjacent to the NYS Route 63 corridor.	• Metering and maintenance manholes and main line valves would be graded level with the finish grade and topography restored to match blend in with surrounding areas. In areas where average high water mark is above manhole elevation, a 2” steel vent would extend 2’ above high water level; this would be painted to blend in with the surrounding area and screened to prevent animals from entering the pipe.
Socioeconomic	• The overall project will benefit socioeconomics of the local community and region in terms of job creation, community development, infrastructure/utilities, and amenities.	• The overall project will benefit socioeconomics of the local community and region in terms of job creation, community development, infrastructure/utilities, and amenities. • This alternative saves over $3.6 million in construction and takes less time to implement.	• None

Appendix G

Summary of Responses to Public Comments

This document provides a response to comments received during the public review period of the National Environmental Protection Act (NEPA) Environmental Assessment (EA) and U.S. Fish and Wildlife Service (USFWS) Compatibility Determination (CD) for the Science & Technology Advanced Manufacturing Park (STAMP) Offsite Sewer Project Request for Right-of-Way (ROW) across Iroquois National Wildlife Refuge (INWR).

Public review meetings were held on February 4, 2020 and February 6, 2020. A request to extend the public review period by one week was granted at the first public meeting so that the public review period ran from January 16, 2020 until February 21, 2020. All comments received at the public meetings and written comments are represented below. A response to each comment is provided directly below the comment in italics. Comments have been placed into categories and numbered for ease of reference.

Project Design and Construction

1. Why put pipe in area that is inaccessible and then need to replace entire pipe with HDD?

The intent of that sentence is that if a pipe needs to be replaced in an area that is environmentally sensitive and should be avoided, then HDD will be used to replace that pipe.

2. Does the federal government get paid for ROW Permit?

Yes, there is a fee associated with the application for a ROW with appropriate permit fees to maintain it. Additionally, the applicant needs to reimburse the USFWS for staff time involved for processing the application and required documents.

3. What type of discharge/company?

The discharge and type of company is unknown at this time. The discharge will require a NYSDEC permit and all discharges from the STAMP site will be permitted, meeting all State and Federal requirements.

4. Is NYSDEC and USACE involved?

Yes – SPDES and wetland permitting.

5. Make sure hoses on equipment have double coverings and other protective BMPs – be clear on what will happen if there is a spill during or after construction – concerned about a project like this (STAMP) that has been sitting there and what if never constructed.

The contractor will be responsible for following the Emergency Action Plan and proper procedures if a spill occurs.

6. When HDD fluid is injected – does it stay there?

HDD fluid is pumped during the HDD process. Most of the fluid will stay in the drilled hole to solidify the hole and some fluid will be pulled back and is filtered in the containment area. The fluid will be filtered with filter socks and dewater pumps and any– additional fluid will be taken offsite.

7. Where will it be taken and how can you be sure?

The disposal will be up to the contractor, likely a landfill. Landfill tickets or some other form of proof of proper disposal will be required.

8. What would water pressure be at max flow?

This will be determined during final design.

9. Why not treat in Medina?

During the approval process, Medina leadership changed. Onsite treatment is a better option overall for the STAMP project.

10. What are the Phases in design flows on page 4 of the engineering report?

The design flows were intended to be a projection of the full build out at STAMP.

11. Need to remove first paragraph on page 5 because that is based on 2013 planning. Now treating onsite and instead of 11 MGD to Medina, will recycle and discharge treated up to 6 MGD

Noted.

12. What is the Alternative Routes Analysis and is it still relevant?

A study that evaluated the best route for the wastewater pipeline. It is still relevant, and the information gathered during that process is still relevant.

13. Why is the pipe diameter 18”-20”?

HDD required 20” pipe to provide an inside diameter of 18” due to its wall thickness.

14. What is the estimated flow at the end of the pipe at 6 MGD?

The amount could fluctuate depending on the businesses and the final design of the STAMP WWTF. The flow will be no more than 6,000,000 gallons in a 24-hour period.

15. Environmental inspector referenced in Frac out plan – who is that?

CPL will have a full-time onsite inspector with daily reporting.

16. In Frac out plan – a vacuum truck will be on call if there is a spill. Shouldn't a vacuum truck be right there instead of on call to pick up immediately?

We will explore the cost and likelihood of need for this option. If needed, it could be a requirement under the contract.

17. Since 2013, have there been any new developments making fracking fluid less toxic?

We will explore this during the detailed design phase of the project.

18. One concern is that the Engineers Report is from 2013 – and it states a pH of 8-10 but 10 is high and if that were to leak what would happen to the swamp?

It would depend on how much is discharged and actual the pH in the swamp and dispersal, etc. Measures will be taken during construction to prevent discharges during construction. Full time monitoring will assist in detecting leaks in the future.

19. Signs on pipes – will it say Sewer Main or will it be changed to post-treated effluent?

It will be changed to read "Post-Treated Effluent

20. No more vent pipes, right?

There will be air release valves, but the wastewater will already be treated by the onsite WWTF.

21. The pipe will be tested with 150 PSI – is that normal or low?

This is the required test pressure only and will only be used for testing purposes. The actual pressure in the pipe during operation will be lower.

22. If the slurry exceeds 5 cy – must stop or brought under control. How do you get that under control?

Drilling operations will be suspended until frac out no longer exceeds containment. On site storage tanks may be utilized by the contractor as well.

23. As on page 10 of the EA, why would there need to be a modification of the proposed layout?

If drilling hits shallow bedrock or unforeseen obstacles, the route may need to be altered to allow installation. Any major changes in the route will be approved in the field by the inspector and reviewed by the USFWS.

24. We are concerned about his project because there is very little "for sure" with this project. The only "for sure" is…an 18 to 20-inch wastewater line from STAMP to Oak Orchard Creek 4.8 miles north of Alabama with a water flow of 6 MGD.

This project has been designed to a level of detail specific to review under NEPA and the Refuge Compatibility Determination process. Additional design efforts are currently taking place.

25. We are concerned about going under the creek and the use of HDD fluid injection. We feel it is dangerous to chance contaminating the wildlife refuge.

Trenchless directional drilling construction methods will be used to install the force main below the creek as required. These methods are used throughout the region in order to reduce or avoid impacts on the surrounding environment.

26. We feel a vacuum truck should be on site at all times during construction, not on call.

We will explore the cost and likelihood of need for this option. If needed, it could be a requirement under the contract.

27. Extra protection should be on all construction equipment, all hoses and filling of all the equipment with fluid should be done away from water and in a safe zone.

The contractor will be responsible for following the Emergency Action Plan and proper procedures if a spill occurs.

28. Many questions unanswered because we don't know what will happen if contaminates do go into the groundwater.

Operation monitoring will be continuous. We will have flow meters placed at the beginning and end of the Refuge that will electronically measure the flow amount continuously and an alarm sent if there is a discrepancy in amount of water coming in and leaving the Refuge. The contractor will be responsible for following the Emergency Action Plan and proper procedures if a spill occurs.

29. It's hard to talk positive about this project when there isn't any water treatment plant and we don't know the kind of wastewater going into this pipe.

A WWTF will be constructed on the STAMP site. The wastewater will be treated prior to being pumped through the force main to a specified discharge location. All discharges will be permitted and monitored for compliance.

Project Operation

30. What noxious odors would be released?

None – that line in the EA should be updated with change in project to treated effluent.

31. What vents out of the 2-foot pipe out of the manhole?

There will be air release valves, but the wastewater will already be treated by the onsite WWTF, thus reducing odors.

32. What about contaminants and leaks and monitored outside of business hours. Hard to comment because there doesn't seem to be a best management plan or long-term monitoring or plans for WWTP and how do you know if you don't what you'll be treating?

Engineering Report will be posted online, and hard copies placed at GCEDC and INWR. An onsite WWTF is currently being design for the STAMP project. Monitoring will be continuous. There will be flow meters placed at the beginning and end of the Refuge that will electronically measure the flow amount continuously and an alarm sent if there is a discrepancy in amount of water coming in and leaving the Refuge

33. How is the pipe monitored, what level will effluent be treated to?

Conversations with NYSDEC are underway to get the required levels that businesses will need to treat to. The monitoring is done electronically even outside of business hours. There are construction details, a frac out plan, SWPPP, equipment, construction BMP – that will be placed on the website

34. What about an automatic shut off option?

That is something that will be reviewed and may be incorporated into the full design of the WWTF.

35. What about after the 2-year monitoring period?

A private transportation corp will be developed to run sewer and water – a private utility line responsible for monitoring and maintaining.

36. Will USFWS have their own spill equipment on site in case there is a spill to respond quicker than private transportation corp.

That is not part of the plan at this time.

37. Who will be there monitoring construction contractor to make sure that no impacts?

Inspectors will be there full time making sure the force main is constructed according to the design plans. It is likely that the NYSDOT will make periodic visits and the USFWS will be onsite during construction as well.

38. Need to have full time monitoring, not weekly.

Operation Monitoring is actually continuous. There will be flow meters placed at the beginning and end of the Refuge that will electronically measure the flow amount continuously and an alarm sent if there is a discrepancy in amount of water coming in and leaving the Refuge.

39. Is the 12V power system for remote reading inside metering manhole to measure flow?

Operation Monitoring will be continuous. There will be flow meters placed at the beginning and end of the Refuge that will electronically measure the flow amount continuously and an alarm sent if there is a discrepancy in amount of water coming in and leaving the Refuge. The required power system will be further defined in design.

40. Page 53 – Notification states "and/or" between USACE and USFWS, why?

It will be USFWS so the "USACE" will be removed.

41. Are there plans in the future of that discharge line being owned by the Town?

The Town of Alabama has stated that they do not want to own the force main. It will be private but will have to be backed by the Town should private transportation corp fail for some reason. The Town does have long term plans to construct sewer mains within the hamlet that would be then sent to the WWTF on the STAMP site.

42. If the Town sent a sewer line for the hamlet to the treatment plant at STAMP would a bigger or second line be required?

No, we will reserve 100,000 gallons of capacity for future Town possibilities.

43. No one knows if there is any long-term monitoring of the leaks or other problems, no monitoring on weekends or after business hours.

Operation monitoring is actually continuous. There will be flow meters placed at the beginning and end of the Refuge that will electronically measure the flow amount

continuously and an alarm sent if there is a discrepancy in amount of water coming in and leaving the Refuge.

44. We are concerned that no automatic shut-offs will be in place before INWR in case of leaks.

That is something that will be reviewed and may be incorporated into the full design of the WWTF.

45. We hope the vent pipe will be changed to say, "Caution Pressure Wastewater Main".

Noted.

46. When we asked if there was an "Emergency Response Plan", the GCEDC said they weren't that far yet. But there is an entire section in the Engineering Report showing us they are still going by the 2013 report or they just don't care about what is in the report.

There are construction details, a frac out plan, SWPPP, equipment, construction BMP – that will be placed on the website. Detailed design of the force main is currently underway.

Wildlife and Habitat

47. What about construction outside of April-June and other bird/animal species?

Construction through the refuge will avoid the April-June timeframe and HDD will also be utilized to minimize the impacts of construction, including to bird/animal species.

48. Did we review other areas outside of refuge for wildlife habitat, listed species, northern harrier, etc?

Yes, this document is for only addressing the INWR.

49. How far is the heron rookery from the centerline of the road?

At least 200 feet into the woods.

50. We are concerned about what time of year this project will be at INWR; salamanders and birds mate and lay eggs in early spring, turtles lay eggs in June, turtles hatch in September. They can't tell us when work will be at INWR?

Construction through the refuge will avoid the April-June timeframe and HDD will also be utilized to minimize the impacts of construction, including to bird/animal species. This also includes the amount of area that will be disturbed during construction.

51. We have little trust with GCEDC. We hope every precaution will be taken to protect all wildlife so this project can be completed with least amount of damage to wildlife.

Noted.

52. We hope that the monies that INWR receive for use of this land doesn't affect the ability to make the right decisions for all wildlife.

The decision to allow the ROW is based on being a refuge compatible use which relates back to the purpose the refuge was establishes and/or the Mission of the National Wildlife Refuge System. It is agreed that the suggested 10' wide (5' either side of CL) would be appropriate depending on depth of force main. However, access is also a consideration. It is desirable to access the sewer line from the existing Route 63 roadway.

Cultural Resources

53. What cultural resources would be considered significant? Would human remains be significant?

Yes. A Phase 1 survey was completed at all HDD drilling sites to assess the potential of all cultural resources with synopsis presented in this EA. If any cultural resources, including human remains, are discovered during construction, all project actions are halted until investigated by USFWS Regional Archeologist and/or the State Historic Preservation Officer.

54. Are other methods being used for CRI like radar to avoid damage to potential resources with standard test pits?

Not at this time.

General Comments

55. Do our comments matter?

Yes, comments are considered in the findings and completion of NEPA which will be provided to the public when complete.

56. From our point of view this project is nothing more than a waste of time and money and taking a chance on polluting INWR and harming wildlife.

Noted.

Comments Not Relevant to This EA/CD

57. Where is the 6MG of water coming from and how did you come up with that amount?

Niagara County. We reviewed various industry standards for companies that we are trying to attract, which has changed over time. Originally, we looked at 12 MGD, but have since reduced to 6 MGD due to the likelihood of recycling of process water onsite.

58. Have the impacts associated with bringing water from Niagara County been considered?

A SEQR update is in progress.

59. What does NYSDEC typically allow as required treatment – what levels? What is the standard that NYSDEC will use?

We have not been given those limits yet because it depends on volume and constituency of Oak Orchard Creek. DEC does have limits onsite for different industries, but it is based also on the low flow of the stream.

60. Spills are a real concern.

Spills are a NYSDEC issue and will work with NYSDEC to ensure compliance and NYSDEC will issue permit to individual companies to individually enforce.

61. Will there be a meeting for NYSDEC review (SPDES and Wetland permits)?

There will be a public notice period.

62. What considerations are given to extra flow downstream?

A Hydrology study will be conducted to ensure the STAMP discharge will not cause additional flooding issues and if the discharge needs to be adjusted to a different location along the creek.

63. What is the water temperature that will be discharged?

That will be part of the SPDES permit requirements, but the discharge cannot have more than a 5-degree difference between the stream and discharge temperature.

64. It's disheartening to me that I can't trust NYSDEC to do its job.

Noted.

65. The USACE won't give permits until an anchor tenant is identified for this site.

Noted.

66. We did not read the Conceptual Water and Wastewater Alternatives and Recommendations Report, so we can't comment on that report.

Noted.

67. We must keep in mind that STAMP has been going on for ten years without any tenants.

Noted.

Appendix H

Finding of No Significant Impact

Genesee County Economic Development Center

STAMP Discharge Analysis to Oak Orchard Creek

May 22, 2020

JM Davidson Engineering, D.P.C.
525 Wheatfield Street | Suite 20
North Tonawanda, New York 14120

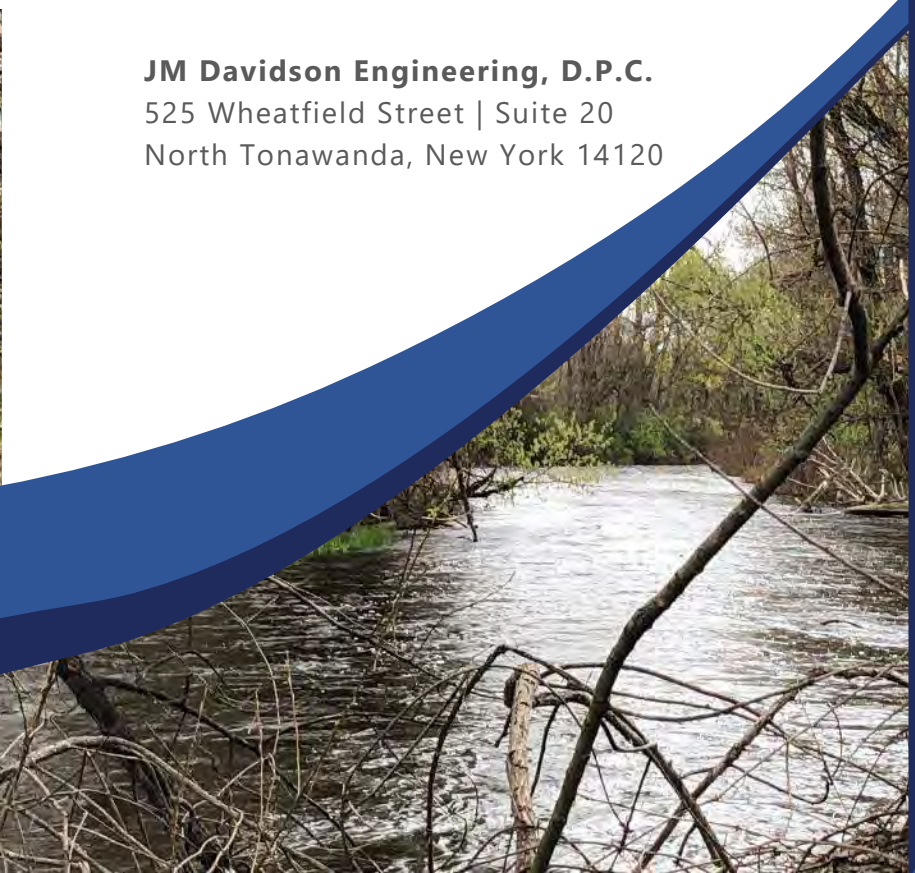


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Appendix C: Photos
Appendix D: Hydraulic Model Documentation

1 Introduction

JM Davidson Engineering, D.P.C. (JMD) was contracted by CPL to perform a hydraulic analysis of Oak Orchard Creek in the Town of Shelby, New York. The hydraulic analysis is part of the design and impact analysis for the Western New York Science and Technology Advanced Manufacturing Park (STAMP) facility proposed by the Genesee County Economic Development Center (GCEDC). As part of the design, the STAMP facility is proposed to provide its own, individual wastewater treatment facility (WWTF). While the STAMP facility is proposed to be constructed in Genesee County in the Town of Alabama, the WWTF is proposed to discharge, via a force main, into Oak Orchard Creek in the Town of Shelby, Orleans County, approximately 2,500 ft downstream of the Main Street bridge (Figure 1).

The purpose of this hydraulic analysis is to determine the impact to flooding, if any, that the additional WWTF effluent discharge will have on Oak Orchard Creek in the vicinity of the anticipated force main discharge location ("Project Area").

2 Hydrologic Analysis

2.1 FEMA

Within the Town of Shelby, there is no Special Flood Hazard Area (SFHA) associated with Oak Orchard Creek. Oak Orchard Creek, in the vicinity of the Project Area, is located on FIRM map panel 361258B03, effective December 23, 1983; however, this panel is not individually printed as the entire area is categorized as Zone C. The Map Index for the Town of Shelby is included in **Appendix A**.

Within the Village of Medina, at the downstream limits of the hydraulic analysis study area, Oak Orchard Creek is shown with an approximate floodplain categorized as a Zone A, as depicted on FIRM map panel 3606440001B, effective March 28, 1980. The FIRM panel for the Village of Medina is included in **Appendix A**.

Since Oak Orchard Creek was not studied in detail by FEMA for the development of the FIRMs in the Town of Shelby or the Village of Medina, no detailed information on the anticipated flood levels or discharges is available from FEMA.

2.2 USGS Stream Stats

A USGS Stream Stats analysis was run for Oak Orchard Creek at a location downstream of the Main Street bridge crossing, near the anticipated force main discharge location. The drainage area at this point is approximately 153 square miles. Table 1 provides the Stream Stats estimated peak discharges. The Stream Stats report is included in **Appendix B.**

2.3 USGS Gage Data

Within the vicinity of the Project Area, two USGS gages were identified as sources of potential discharge data:

- USGS 04220045 Oak Orchard Creek Near Shelby, NY – This is an inactive station, located upstream of the study area, just upstream of the Harrison Road bridge crossing. This station has a 13 year period of record of peak discharges including 1977, 1978, 2009-2019. The drainage area at this location is reported as 146 square miles.
- USGS 04220150 Oak Orchard Creek C at Medina, NY – This is an inactive station, located within the hydraulic study area just upstream of the Maple Ridge Road bridge crossing. The station has a 15 year period of

record of peak discharges ranging from 1962 to 1976. The drainage area at this location is reported as 157 square miles.

Log Pearson Type III (LPIII) analyses were conducted for the peak discharge data at both gages to determine the statistical peak discharge for various return periods. These peak discharges were then compared to the peak discharges estimated using Stream Stats at the same location. While the period of record for both gages is relatively short, the LPIII analyses show that the Stream Stats, which uses regression equation analyses, seems to be over estimating the anticipated peak discharges throughout Oak Orchard Creek – and therefore is not recommended to be utilized as the design discharges in the hydraulic model. The LPIII data is provided in Table 1 .

Since the USGS gage data has a limited period of record, a secondary analysis was conducted in accordance with USGS SIR 2006-5112 *Magnitude and Frequency of Floods in New York*, which determines peak discharges using regression equations; however, the data is weighted with the nearby gage LPIII data. This data is shown in Table 1.

Table 1: Oak Orchard Creek Peak Discharge Analysis Summary

Oak Orchard Discharges							
Drainage Area (Sq. Mi.):	146	146	146	153	153	157	157
Return Period	**Stream Stats @ Harrison Road**	**LPIII @ Harrison Road**	**Weighted LPIII @ Harrison Road**	**Stream Stats @ Main Street**	**Stream Stats @ Medina Gage**	**LPIII @ Medina Gage**	**Weighted LPIII @ Medina Gage**
10-yr	2,540	1,128	1,375	2,570	2,570	1,460	1,640
50-yr	3,480	1,388	1,785	3,500	3,500	1,810	2,200
100-yr	3,870	1,493	1,955	3,890	3,890	1,940	2,420
500-yr	4,850	1,750	2,369	4,850	4,850	2,210	2,910

2.4 Recommended Discharges

It is recommended that the gage weighted LPIII data be utilized as the most reliable indicator of potential peak flood discharges since the regression equations appear too conservative and since the period of record for the two USGS gages is relatively short. The weighted LPIII data provides a more conservative discharge value than the LPIII data alone; however, is not as conservative as the regression equations alone. Since there is very little drainage area increase between the Main Street bridge and the USGS gage near Maple Ridge Road bridge on Oak Orchard Creek, it is recommended that the weighted LPIII data from the downstream gage be used in the hydraulic design analysis. Table 2 shows the recommended discharges for the hydraulic analysis.

Table 2: Recommended Discharges

Recommended Peak Discharges	
Return Interval	**Discharge (cfs)**
10-yr	1,640
50-yr	2,200
100-yr	2,420
500-yr	2,910

3 Hydraulic Analysis

A hydraulic model was built for Oak Orchard creek using HEC-RAS version 5.0.7. The model extends from just downstream of the Shelby Center Dam, upstream of the Main Street bridge crossing, to the downstream end of John E. Butts Memorial Park in the Village of Medina. The model is approximately 10,000 feet in length (Figure 2).

3.1 Geometry

The hydraulic model was built using available 1m LiDAR data from the NYSDEC GIS Database. Since the proposed model will not change any geometry, only discharge, it was assumed that the utilization of LiDAR data would be sufficient for this model.

JMD staff conducted a field visit on May 4, 2020 to take field measurements of the Main Street bridge and the Maple Ridge Road bridge, including channel depths in the vicinity of the bridges. This data was incorporated into the model. Channel modifications were made to the LiDAR cross-sections to mimic the channel depths measured in the field, while maintaining a similar profile to that of the original hydro-flattened LiDAR sections.

Photos from the field visit are included in **Appendix C**.

3.2 Existing Hydraulic Conditions

Oak Orchard flows from south to north. Upstream of the Project Area, a small run of river dam controls water levels upstream of Main Street. The dam is a Class B dam that looks to have been a former mill dam. The mill race is still active along the left side of the creek. The mill race re-enters the main channel downstream of Main Street. The project proposes no changes to the function or discharges at the dam; therefore, the model begins just downstream of the dam.

Between the dam and the Main Street bridge, the channel is moderately steep. Approaching the bridge, the channel is comprised of bedrock. The channel takes a significant drop just upstream of the bridge, where a small hydraulic jump occurs. Under the bridge and a short distance downstream, the bedrock channel is relatively flat with a moderate grade.

The Main Street bridge is a single span concrete bridge with vertical abutments. The footings are exposed at both abutments. A pipe bridge is located just upstream of the roadway bridge. The pipe bridge is comprised of two I-beams. The low chord of the pipe bridge appears to be the same or slightly higher than the roadway bridge. The bridges are skewed 26° from the flow direction of the channel, thus reducing the effective width of the bridge opening.

Based on the existing conditions modeling, the Main Street bridge has over 4 feet of freeboard to passing the 100-yr event.

Approximately 75 feet downstream of the bridge, the bedrock channel begins to steepen significantly. The channel meanders to the right slightly and the bed elevation drops over 30 feet over the next 875 feet, with the steepest fall in the first 200 feet. This drop in elevation brings the channel down into a gulley running parallel to S Gravel Road.

It is probable that portions of the upper reach of the study area achieve supercritical flow during some events. Since true supercritical flow is rare in natural conditions, and would result in lower water surface elevations, the model was run using subcritical flow only. This allows portions of the model to reach critical depth but does not calculate the lower potential supercritical flow depths. This provides a more conservative water depth and flood inundation level for the reach.

Near the end of Mill Street is where the channel begins to flatten out again, as evidenced by the braided channels visible in the aerial imagery and the LiDAR data. The channel is nearly 50 feet below the surrounding ground elevation along S Gravel Road to the west and the agricultural fields to the east. It is in this area that the force main is proposed to discharge.

The channel and gulley meanders south through a densely wooded area until nearing Maple Ridge Road. Approaching Maple Ridge Road, the channel is much flatter with a defined stream and banks. Near the roadway, several maintained properties bound the channel and the floodplain is significantly less wooded than upstream.

Maple Ridge Road bridge is a single span girder bridge perpendicular to the channel with vertical abutments. The channel bottom is gravel and silt. At the time of the site visit the channel flow width extended from abutment to abutment.

Based on the existing conditions modeling, the Maple Ridge Road bridge has just under 2 feet of freeboard for the 50-yr event and approximately 1.7 ft of freeboard for the 100-yr event. NYSDOT criteria requires bridges to maintain 2 feet of freeboard for the 50-yr event, thus supporting the approximate conditions of this model.

Approaching Maple Ridge Road and downstream of the bridge, the channel is no longer in a gulley and flow is allowed to expand to the adjacent floodplains.

The hydraulic modeling shows that no structures are impacted by the existing 100-yr flood elevations and both bridges in the study area are able to pass the 100-yr event with freeboard.

3.3 Proposed Conditions

Currently, the STAMP WWTF is proposing a maximum discharge of 6 MGD (9.3 cfs) through the force main into Oak Orchard Creek at the proposed force main discharge location resulting in a 0.4% increase to the 100-yr discharge.

In order to determine the impacts of the slight increase in flow, the proposed model was developed utilizing the existing condition geometry and increasing the peak discharges by 9.3 cfs beginning roughly 2,000 feet downstream of the Main Street bridge (XS 7887). Table 3 shows a comparison of the water surface elevations for the 100-yr event for both the existing and proposed conditions within the hydraulic study area. Figure 3 shows the 100-yr flood extents within the hydraulic study area. Documentation from the hydraulic model is included in **Appendix D**.

Table 3: Comparison of 100-yr WSELs from Existing to Proposed

River Sta	Profile	Existing WSEL (ft)	Proposed WSEL (ft)	Difference
10530	100-yr	597.02	597.02	0.00
10316	100-yr	593.65	593.65	0.00
10148	100-yr	592.35	592.35	0.00
10079	100-yr	590.90	590.90	0.00
10055	100-yr	590.89	590.89	0.00
10023	Main Street Bridge			
9983	100-yr	589.22	589.22	0.00
9908	100-yr	587.20	587.20	0.00

River Sta	Profile	Existing WSEL (ft)	Proposed WSEL (ft)	Difference
9843	100-yr	576.53	576.53	0.00
9737	100-yr	567.77	567.77	0.00
9614	100-yr	563.61	563.61	0.00
9393	100-yr	557.70	557.70	0.00
9052	100-yr	551.56	551.56	0.00
8678	100-yr	547.16	547.16	0.00
8379	100-yr	544.16	544.16	0.00
7887	100-yr	542.08	542.09	0.01
7518	100-yr	541.72	541.73	0.01
7013	100-yr	541.13	541.14	0.01
6428	100-yr	540.99	541.01	0.02
5965	100-yr	540.80	540.81	0.01
5304	100-yr	540.36	540.38	0.02
4450	100-yr	539.67	539.68	0.01
3779	100-yr	538.95	538.96	0.01
3345	100-yr	538.52	538.53	0.01
3031	100-yr	538.29	538.30	0.01
2757	100-yr	538.02	538.03	0.01
2444	100-yr	537.31	537.32	0.01
2349	100-yr	536.83	536.84	0.01
2316	Maple Ridge Road Bridge			
2274	100-yr	536.28	536.27	-0.01
2158	100-yr	536.07	536.06	-0.01
1835	100-yr	535.13	535.14	0.01
1407	100-yr	533.05	533.06	0.01
1009	100-yr	531.94	531.95	0.01
634	100-yr	529.50	529.52	0.02
276	100-yr	526.47	526.47	0.00
116	100-yr	523.20	523.21	0.01

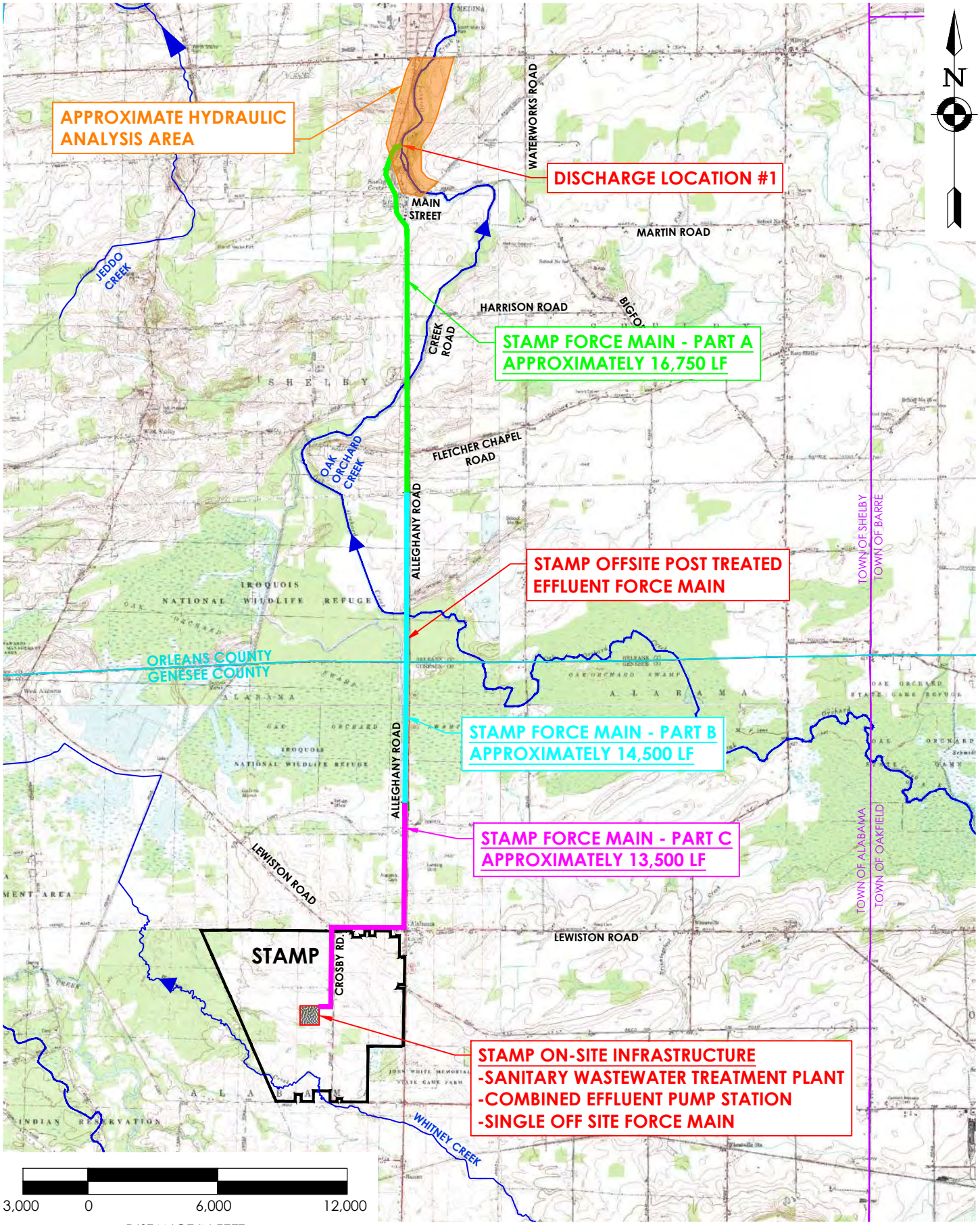
4 Summary

The 9.3 cfs (6 MGD) anticipated increased peak discharge to Oak Orchard Creek is a very small quantity compared to the overall statistical peak discharges. The hydraulic modeling indicates that the increased discharge will have a negligible effect on the flood elevations in Oak Orchard Creek. There will be no impact to the existing bridge hydraulics at Maple Ridge Road bridge and no structures will be impacted by the increased discharge. The discharge will have a greater impact on lesser storms since the peak WWTF discharge has the potential to be a larger percentage of the riverine peak discharge (i.e., 0.6% increase to the 10-yr); however, the increase is still very small and would not result in significant observable changes to the anticipated water surface elevations. Therefore, no mitigation is recommended.

Since there is no detailed FEMA analysis for this area of Oak Orchard Creek, floodplain regulations do not require a no-rise analysis, nor would a Letter of Map revision be required. No structures are impacted by the increased discharge. As such, the discharge point is in compliance with FEMA regulations.

Figures





205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
www.clarkpatterson.com
Clark Patterson Lee
ARCHITECTURE | ENGINEERING | PLANNING

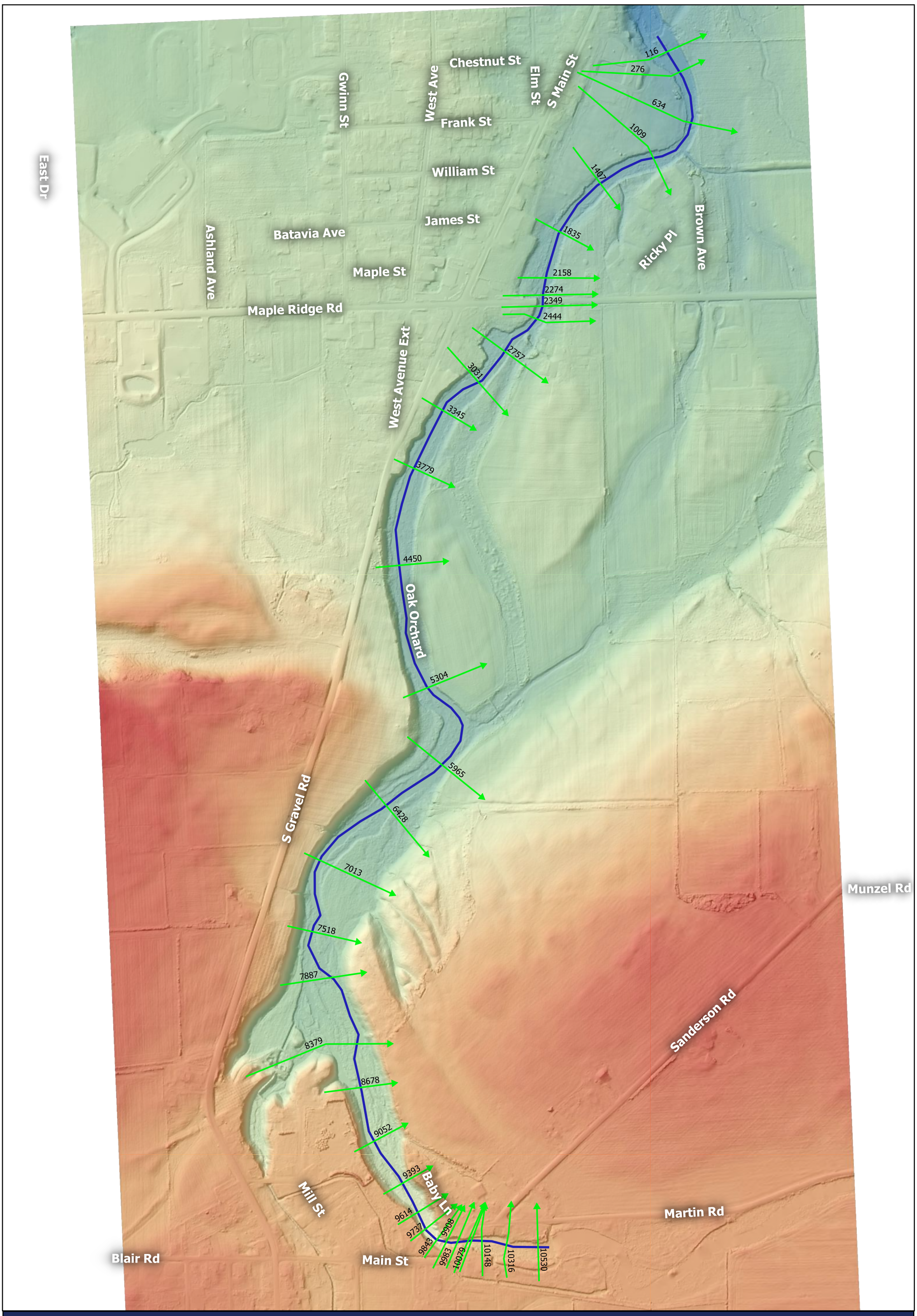
DATE:	1/2/20
DRAWN:	NLC
CHECKED:	XXX
SCALE:	1"=6,000'
PROJ. #:	XXXX.XX

SANITARY EFFLUENT DISCHARGE LOCATION MAP

GENESEE COUNTY ECONOMIC DEVELOPMENT CENTER
STAMP OFFSITE POST TREATED EFFLUENT FORCE MAIN

TOWN OF ALABAMA, NEW YORK STATE

Drawing Name: J:\PROJECTS\GCEDC\STAMP Offsite Sewer\D Design\ACAD\Civil\Figures\2020_03_13 Force Main Discharge Location and Study.dwg
Date last accessed: 3/13/2020 2:27 PM
Date last plotted: 3/13/2020 2:27 PM
Plotted By: Andrew Kosa

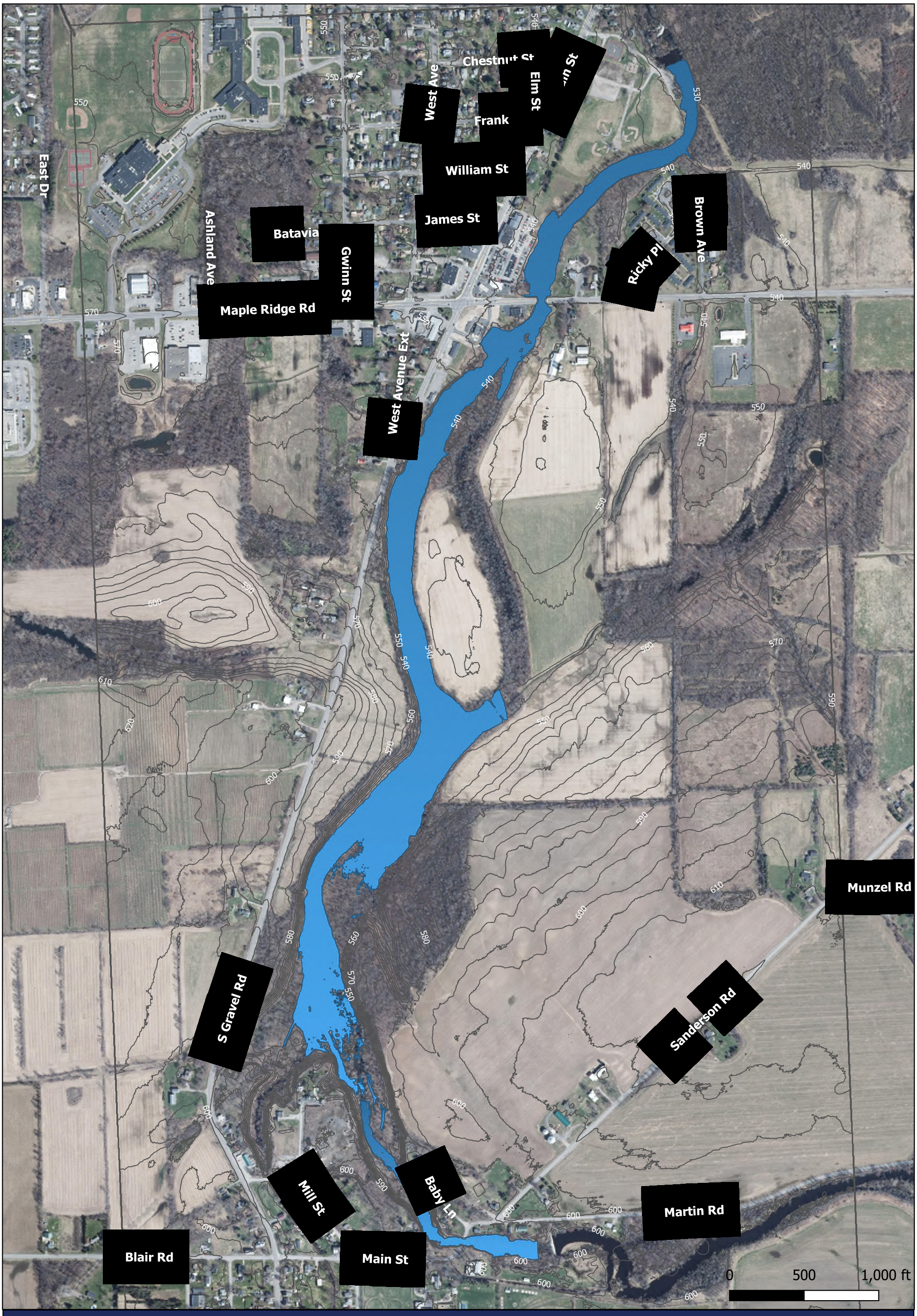


GENESEE COUNTY IDA - STAMP DISCHARGE ANALYSIS

JMDavidson Engineering, D.P.C.

HYDRAULIC STUDY AREA

FIG. 2



GENESEE COUNTY IDA - STAMP DISCHARGE ANALYSIS

JMDavidson Engineering, D.P.C.

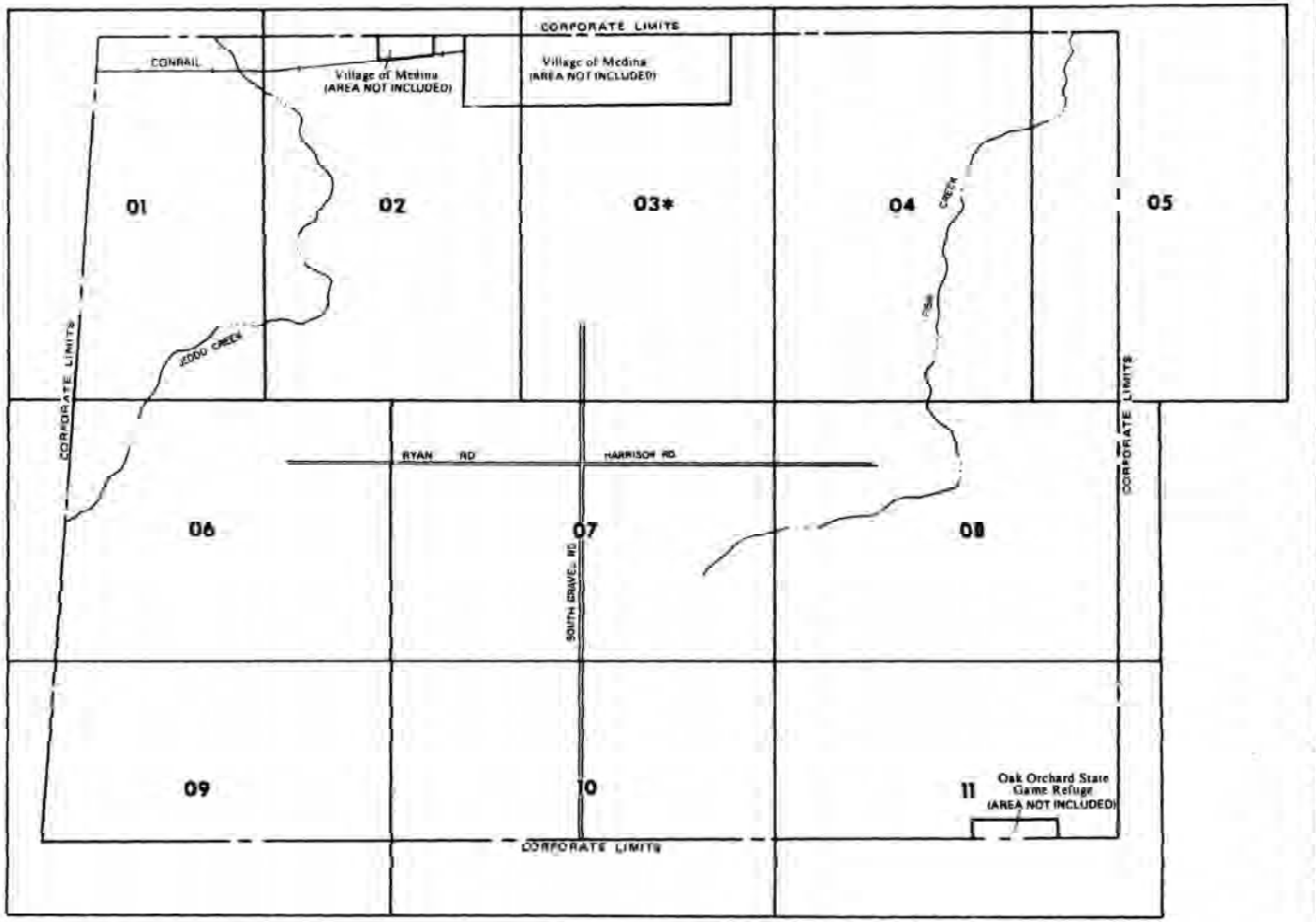
100-YR FLOOD INUNDATION

FIG. 3

Appendix A:

FEMA Documentation





*PANEL NOT PRINTED-AREA ALL IN ZONE C

KEY TO SYMBOLS

ZONE DESIGNATIONS*

ZONE C
ZONE A
ZONE C

Base Flood Elevation Line with elevation in feet — 513 —

Base Flood Elevation where uniform within zone (EL 987)

Elevation Reference Mark RM7

River Mile

*EXPLANATION OF ZONE DESIGNATIONS

A flood insurance map displays the zone designations for a community according to areas of designated flood hazards. The zone designations used by FEMA are:

Zone	Explanation
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding; flood depth 1 to 3 feet; product of flood depth (feet) and velocity (feet per second) less than 15.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by a flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Area between limits of 100-year flood and 500-year flood; areas of 100-year shallow flooding where depths less than 1 foot.
C	Areas outside 500-year flood.
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

INITIAL IDENTIFICATION: **NOVEMBER 8, 1974**

FLOOD HAZARD BOUNDARY MAP REVISIONS: **DECEMBER 12, 1978**

FLOOD INSURANCE RATE MAP EFFECTIVE: **DECEMBER 23, 1983**

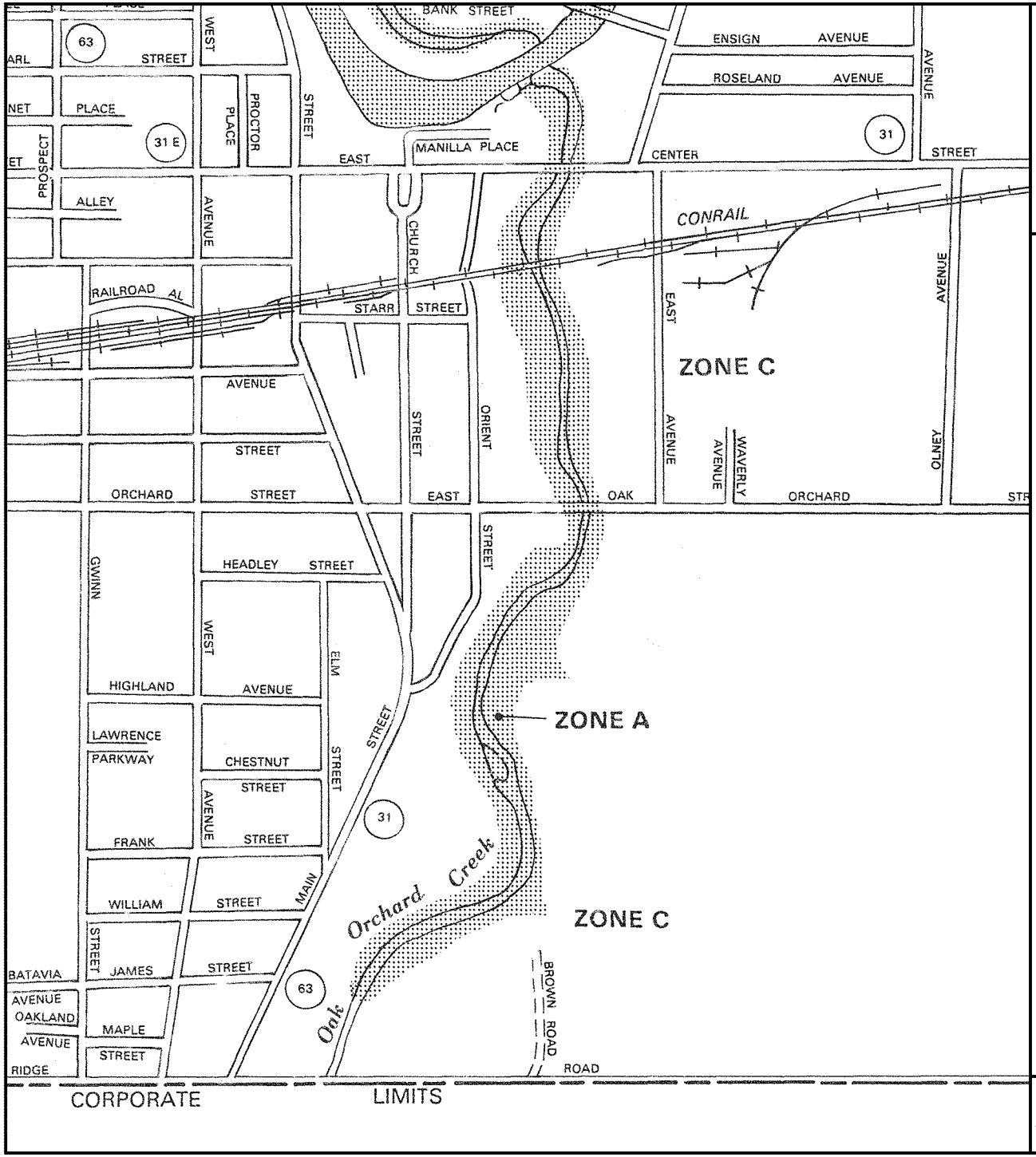
FLOOD INSURANCE RATE MAP REVISIONS

federal emergency management agency

FIRM
FLOOD INSURANCE RATE MAP 01-11
MAP INDEX

TOWN OF SHELBY, NY
ORLEANS COUNTY

COMMUNITY NUMBER 361268 B



APPROXIMATE SCALE IN FEET

800 0 800

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

VILLAGE OF
MEDINA,
NEW YORK
ORLEANS COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER:
360644 0001 B

EFFECTIVE DATE:
MARCH 28, 1980

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

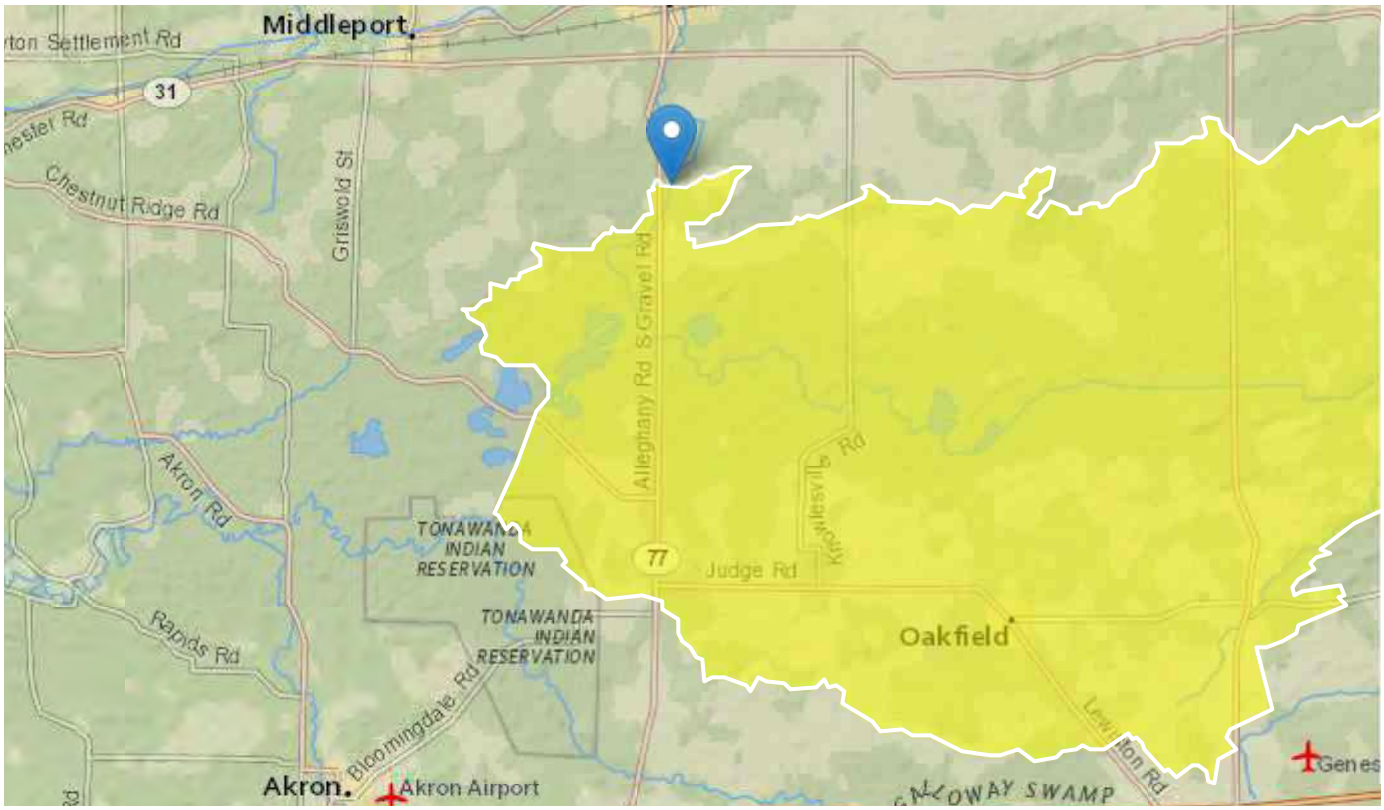
Appendix B:

Stream Stats Reports



StreamStats Report - Upstream Gage At Harrison Road

Region ID: NY
Workspace ID: NY20200410130707221000
Clicked Point (Latitude, Longitude): 43.17442, -78.38661
Time: 2020-04-10 09:07:24 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	146	square miles
SLOPERATIO	Ratio of main channel slope to basin slope as defined in SIR 2006-5112	0.0871	dimensionless
EL1200	Percentage of basin at or above 1200 ft elevation	0	percent
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	3.21	percent

Parameter Code	Parameter Description	Value	Unit
MAR	Mean annual runoff for the period of record in inches	14.2	inches
BSLOPCM	Mean basin slope determined by summing lengths of all contours in basin mulitplying by contour interval and dividing product by drainage area	57.2	feet per mi
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	234729.5	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	4778923.9	meters
CONTOUR	Total length of all elevation contours in drainage area in miles	83.87	miles
CSL1085LO	10-85 slope of lower half of main channel in feet per mile.	1.45	feet per mi
CSL1085UP	10-85 slope of upper half of main channel in feet per mile.	12	feet per mi
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	4.98	feet per mi
FOREST	Percentage of area covered by forest	24.4	percent
JULAVPRE	Mean July Precipitation	3.1	inches
JUNAVPRE	Mean June Precipitation	3.77	inches
JUNMAXTMP	Maximum June Temperature, in degrees F	77.4	degrees F
LAGFACTOR	Lag Factor as defined in SIR 2006-5112	6.07	dimensionless
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	5.06	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	1.04	percent
LENGTH	Length along the main channel from the measuring location extended to the basin divide	34.3	miles
MAYAVPRE	Mean May Precipitation	3.14	inches
MXSNO	50th percentile of seasonal maximum snow depth from Northeast Regional Climate Center atlas by Cember and Wilks, 1993	15.3	inches

Parameter Code	Parameter Description	Value	Unit
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	224735	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	4785755	feet
PRECIP	Mean Annual Precipitation	34.2	inches
PRJUNAUG00	Basin average mean precip for June to August from PRISM 1971-2000	10.3	inches
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	1.37	percent
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	36.5	percent

Peak-Flow Statistics Parameters[2006 Full Region 6]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	146	square miles	0.58	2467
SLOPERATIO	Slope Ratio NY	0.0871	dimensionless	0.019	0.698
EL1200	Percentage of Basin Above 1200 ft	0	percent	0	100
STORAGE	Percent Storage	3.21	percent	0	5.98
MAR	Mean Annual Runoff in inches	14.2	inches	9.49	22.77

Peak-Flow Statistics Flow Report[2006 Full Region 6]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp	Equiv. Yrs.
1.25 Year Peak Flood	1110	ft^3/s	34.7	34.7	2.3
1.5 Year Peak Flood	1300	ft^3/s	33.3	33.3	2
2 Year Peak Flood	1530	ft^3/s	32.3	32.3	1.9
5 Year Peak Flood	2130	ft^3/s	32.2	32.2	2.4
10 Year Peak Flood	2540	ft^3/s	32.9	32.9	3.1
25 Year Peak Flood	3080	ft^3/s	34.4	34.4	3.9

Statistic	Value	Unit	SE	SEp	Equiv. Yrs.
50 Year Peak Flood	3480	ft^3/s	35.8	35.8	4.5
100 Year Peak Flood	3870	ft^3/s	37.2	37.2	4.9
200 Year Peak Flood	4310	ft^3/s	39	39	5.2
500 Year Peak Flood	4850	ft^3/s	41.4	41.4	5.5

Peak-Flow Statistics Citations

Lumia, Richard, Freehafer, D.A., and Smith, M.J.,2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 p. (http://pubs.usgs.gov/sir/2006/5112/)

Bankfull Statistics Parameters[100 Percent (146 square miles) Bankfull Region 7 SIR2009 5144]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	146	square miles	1.07	349

Bankfull Statistics Flow Report[100 Percent (146 square miles) Bankfull Region 7 SIR2009 5144]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu
Bankfull Area	418	ft^2	154	1140
Bankfull Depth	3.96	ft	1.34	11.7
Bankfull Streamflow	1680	ft^3/s	239	11800
Bankfull Width	106	ft	37.6	298

Bankfull Statistics Citations

Mulvihill, C.I., Baldigo, B.P., Miller, S.J. , and DeKoskie, Douglas,2009, Bankfull Discharge and Channel Characteristics of Streams in New York State: U.S. Geological Survey Scientific Investigations Report 2009-5144, 51 p. (http://pubs.usgs.gov/sir/2009/5144/)

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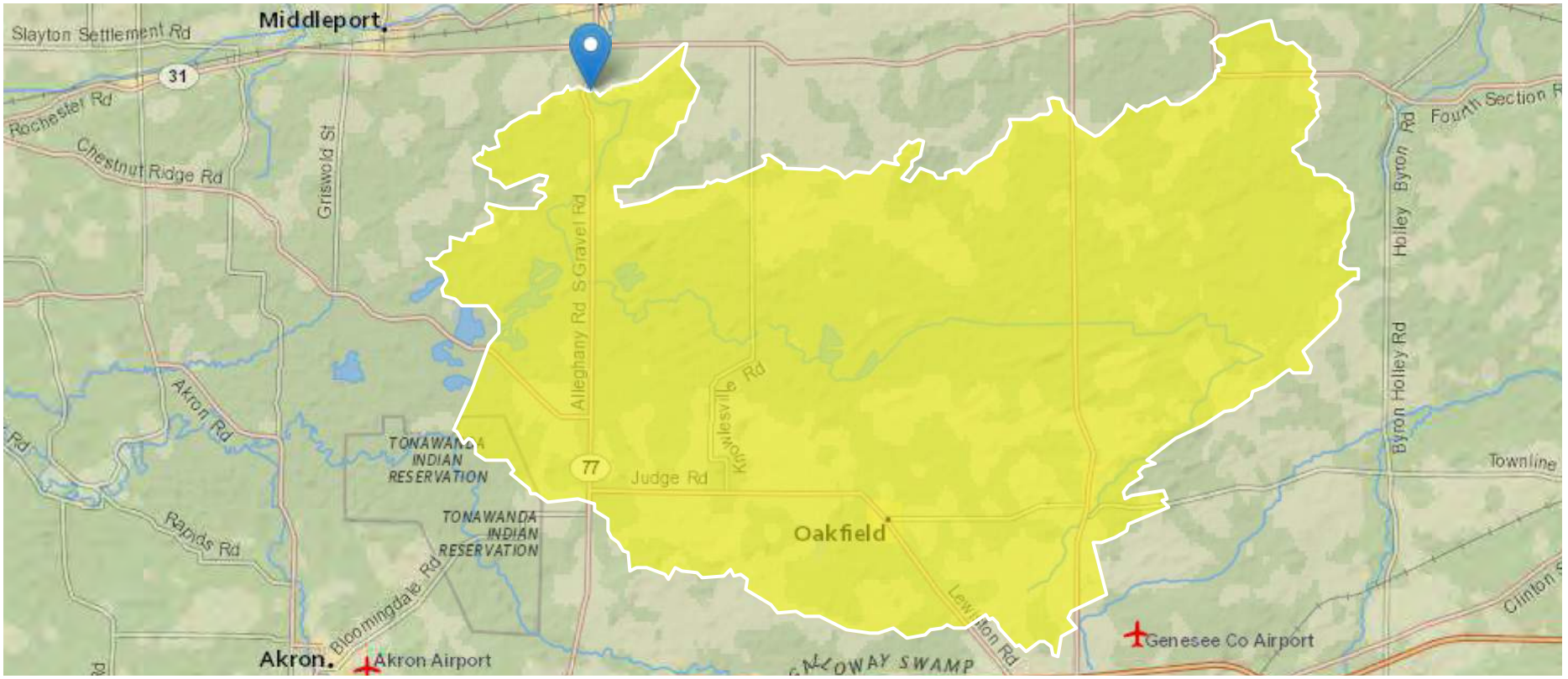
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Application Version: 4.3.11

StreamStats Report - Oak Orchard, d/s of Mill Race/Ag Discharge

Region ID: NY
Workspace ID: NY20200312122246831000
Clicked Point (Latitude, Longitude): 43.19379, -78.39136
Time: 2020-03-12 08:23:07 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	153	square miles
SLOPERATIO	Ratio of main channel slope to basin slope as defined in SIR 2006-5112	0.0763	dimensionless
EL1200	Percentage of basin at or above 1200 ft elevation	0	percent
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	3.13	percent
MAR	Mean annual runoff for the period of record in inches	14.3	inches
BSLOPCM	Mean basin slope determined by summing lengths of all contours in basin mulitplying by contour interval and dividing product by drainage area	61.4	feet per mi
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	234303.3	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	4779244.2	meters
CONTOUR	Total length of all elevation contours in drainage area in miles	93.83	miles
CSL1085LO	10-85 slope of lower half of main channel in feet per mile.	1.73	feet per mi
CSL1085UP	10-85 slope of upper half of main channel in feet per mile.	11	feet per mi
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	4.68	feet per mi
FOREST	Percentage of area covered by forest	24.4	percent
JULAVPRE	Mean July Precipitation	3.1	inches
JUNAVPRE	Mean June Precipitation	3.76	inches
JUNMAXTMP	Maximum June Temperature, in degrees F	77.4	degrees F
LAGFACTOR	Lag Factor as defined in SIR 2006-5112	6.44	dimensionless
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	5.06	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	1.03	percent

Parameter Code	Parameter Description	Value	Unit
LENGTH	Length along the main channel from the measuring location extended to the basin divide	36.8	miles
MAYAVPRE	Mean May Precipitation	3.13	inches
MXSNO	50th percentile of seasonal maximum snow depth from Northeast Regional Climate Center atlas by Cember and Wilks, 1993	15.3	inches
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	224435	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	4787925	feet
PRECIP	Mean Annual Precipitation	34.2	inches
PRJUNAUG00	Basin average mean precip for June to August from PRISM 1971-2000	10.3	inches
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	1.44	percent
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	37.3	percent

Peak-Flow Statistics Parameters[2006 Full Region 6]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	153	square miles	0.58	2467
SLOPERATIO	Slope Ratio NY	0.0763	dimensionless	0.019	0.698
EL1200	Percentage of Basin Above 1200 ft	0	percent	0	100
STORAGE	Percent Storage	3.13	percent	0	5.98
MAR	Mean Annual Runoff in inches	14.3	inches	9.49	22.77

Peak-Flow Statistics Flow Report[2006 Full Region 6]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp	Equiv. Yrs.
1.25 Year Peak Flood	1140	ft^3/s	34.7	34.7	2.3
1.5 Year Peak Flood	1330	ft^3/s	33.3	33.3	2
2 Year Peak Flood	1560	ft^3/s	32.3	32.3	1.9
5 Year Peak Flood	2160	ft^3/s	32.2	32.2	2.4
10 Year Peak Flood	2570	ft^3/s	32.9	32.9	3.1
25 Year Peak Flood	3110	ft^3/s	34.4	34.4	3.9
50 Year Peak Flood	3500	ft^3/s	35.8	35.8	4.5
100 Year Peak Flood	3890	ft^3/s	37.2	37.2	4.9
200 Year Peak Flood	4320	ft^3/s	39	39	5.2
500 Year Peak Flood	4850	ft^3/s	41.4	41.4	5.5

Peak-Flow Statistics Citations

Lumia, Richard, Freehafer, D.A., and Smith, M.J.,2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 p. (http://pubs.usgs.gov/sir/2006/5112/)

Bankfull Statistics Parameters[100 Percent (153 square miles) Bankfull Region 7 SIR2009 5144]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	153	square miles	1.07	349

Bankfull Statistics Flow Report[100 Percent (153 square miles) Bankfull Region 7 SIR2009 5144]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu
Bankfull Area	431	ft^2	157	1190

Statistic	Value	Unit	PIl	PIu
Bankfull Depth	4	ft	1.34	11.9
Bankfull Streamflow	1740	ft^3/s	242	12500
Bankfull Width	108	ft	38	307

Bankfull Statistics Citations

Mulvihill, C.I., Baldigo, B.P., Miller, S.J. , and DeKoskie, Douglas,2009, Bankfull Discharge and Channel Characteristics of Streams in New York State: U.S. Geological Survey Scientific Investigations Report 2009-5144, 51 p. (http://pubs.usgs.gov/sir/2009/5144/)

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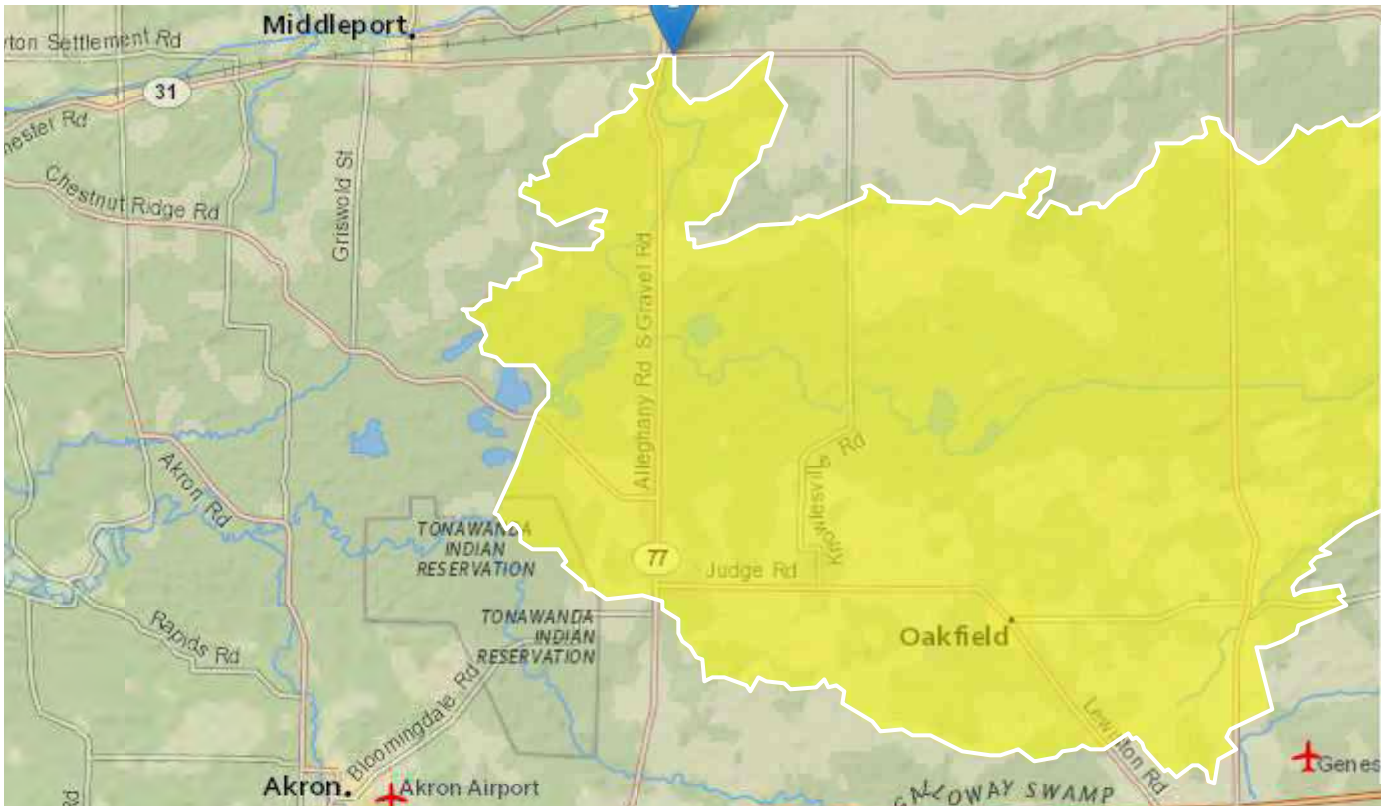
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Application Version: 4.3.11

StreamStats Report - Downstream USGS Gage at Medina

Region ID: NY
Workspace ID: NY20200410131458794000
Clicked Point (Latitude, Longitude): 43.20719, -78.38584
Time: 2020-04-10 09:15:16 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	153	square miles
SLOPERATIO	Ratio of main channel slope to basin slope as defined in SIR 2006-5112	0.0753	dimensionless
EL1200	Percentage of basin at or above 1200 ft elevation	0	percent
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	3.11	percent

Parameter Code	Parameter Description	Value	Unit
MAR	Mean annual runoff for the period of record in inches	14.3	inches
BSLOPCM	Mean basin slope determined by summing lengths of all contours in basin mulitplying by contour interval and dividing product by drainage area	61.9	feet per mi
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	234271.1	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	4779274.8	meters
CONTOUR	Total length of all elevation contours in drainage area in miles	94.82	miles
CSL1085LO	10-85 slope of lower half of main channel in feet per mile.	1.82	feet per mi
CSL1085UP	10-85 slope of upper half of main channel in feet per mile.	10.3	feet per mi
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	4.66	feet per mi
FOREST	Percentage of area covered by forest	24.3	percent
JULAVPRE	Mean July Precipitation	3.1	inches
JUNAVPRE	Mean June Precipitation	3.76	inches
JUNMAXTMP	Maximum June Temperature, in degrees F	77.4	degrees F
LAGFACTOR	Lag Factor as defined in SIR 2006-5112	6.73	dimensionless
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	5.08	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	1.03	percent
LENGTH	Length along the main channel from the measuring location extended to the basin divide	38	miles
MAYAVPRE	Mean May Precipitation	3.13	inches
MXSNO	50th percentile of seasonal maximum snow depth from Northeast Regional Climate Center atlas by Cember and Wilks, 1993	15.3	inches

Parameter Code	Parameter Description	Value	Unit
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	224945	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	4789395	feet
PRECIP	Mean Annual Precipitation	34.2	inches
PRJUNAUG00	Basin average mean precip for June to August from PRISM 1971-2000	10.3	inches
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	1.44	percent
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	37.4	percent

Peak-Flow Statistics Parameters[2006 Full Region 6]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	153	square miles	0.58	2467
SLOPERATIO	Slope Ratio NY	0.0753	dimensionless	0.019	0.698
EL1200	Percentage of Basin Above 1200 ft	0	percent	0	100
STORAGE	Percent Storage	3.11	percent	0	5.98
MAR	Mean Annual Runoff in inches	14.3	inches	9.49	22.77

Peak-Flow Statistics Flow Report[2006 Full Region 6]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp	Equiv. Yrs.
1.25 Year Peak Flood	1140	ft^3/s	34.7	34.7	2.3
1.5 Year Peak Flood	1330	ft^3/s	33.3	33.3	2
2 Year Peak Flood	1560	ft^3/s	32.3	32.3	1.9
5 Year Peak Flood	2150	ft^3/s	32.2	32.2	2.4
10 Year Peak Flood	2570	ft^3/s	32.9	32.9	3.1
25 Year Peak Flood	3100	ft^3/s	34.4	34.4	3.9

Statistic	Value	Unit	SE	SEp	Equiv. Yrs.
50 Year Peak Flood	3490	ft^3/s	35.8	35.8	4.5
100 Year Peak Flood	3880	ft^3/s	37.2	37.2	4.9
200 Year Peak Flood	4300	ft^3/s	39	39	5.2
500 Year Peak Flood	4830	ft^3/s	41.4	41.4	5.5

Peak-Flow Statistics Citations

Lumia, Richard, Freehafer, D.A., and Smith, M.J.,2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 p. (http://pubs.usgs.gov/sir/2006/5112/)

Bankfull Statistics Parameters[100 Percent (153 square miles) Bankfull Region 7 SIR2009 5144]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	153	square miles	1.07	349

Bankfull Statistics Flow Report[100 Percent (153 square miles) Bankfull Region 7 SIR2009 5144]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu
Bankfull Area	431	ft^2	157	1190
Bankfull Depth	4	ft	1.34	11.9
Bankfull Streamflow	1740	ft^3/s	242	12500
Bankfull Width	108	ft	38	307

Bankfull Statistics Citations

Mulvihill, C.I., Baldigo, B.P., Miller, S.J. , and DeKoskie, Douglas,2009, Bankfull Discharge and Channel Characteristics of Streams in New York State: U.S. Geological Survey Scientific Investigations Report 2009-5144, 51 p. (http://pubs.usgs.gov/sir/2009/5144/)

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Application Version: 4.3.11

Appendix C:

Photos





Photo 1: Looking upstream from Main Street bridge.



Photo 2: Looking downstream from right bank at Main Street bridge and upstream attached pipe bridge.



Photo 3: Looking upstream from left bank at Main Street bridge.



Photo 4: Looking downstream from Main Street bridge.



Photo 5: Looking downstream at meander and steep drop just downstream of Main Street bridge.



Photo 6: Looking upstream from Maple Ridge Road bridge.



Photo 7: Looking downstream from right bank at Maple Ridge Road bridge.



Photo 8: Looking upstream at Maple Ridge Road bridge.



Photo 9: Looking downstream from Maple Ridge Road bridge.

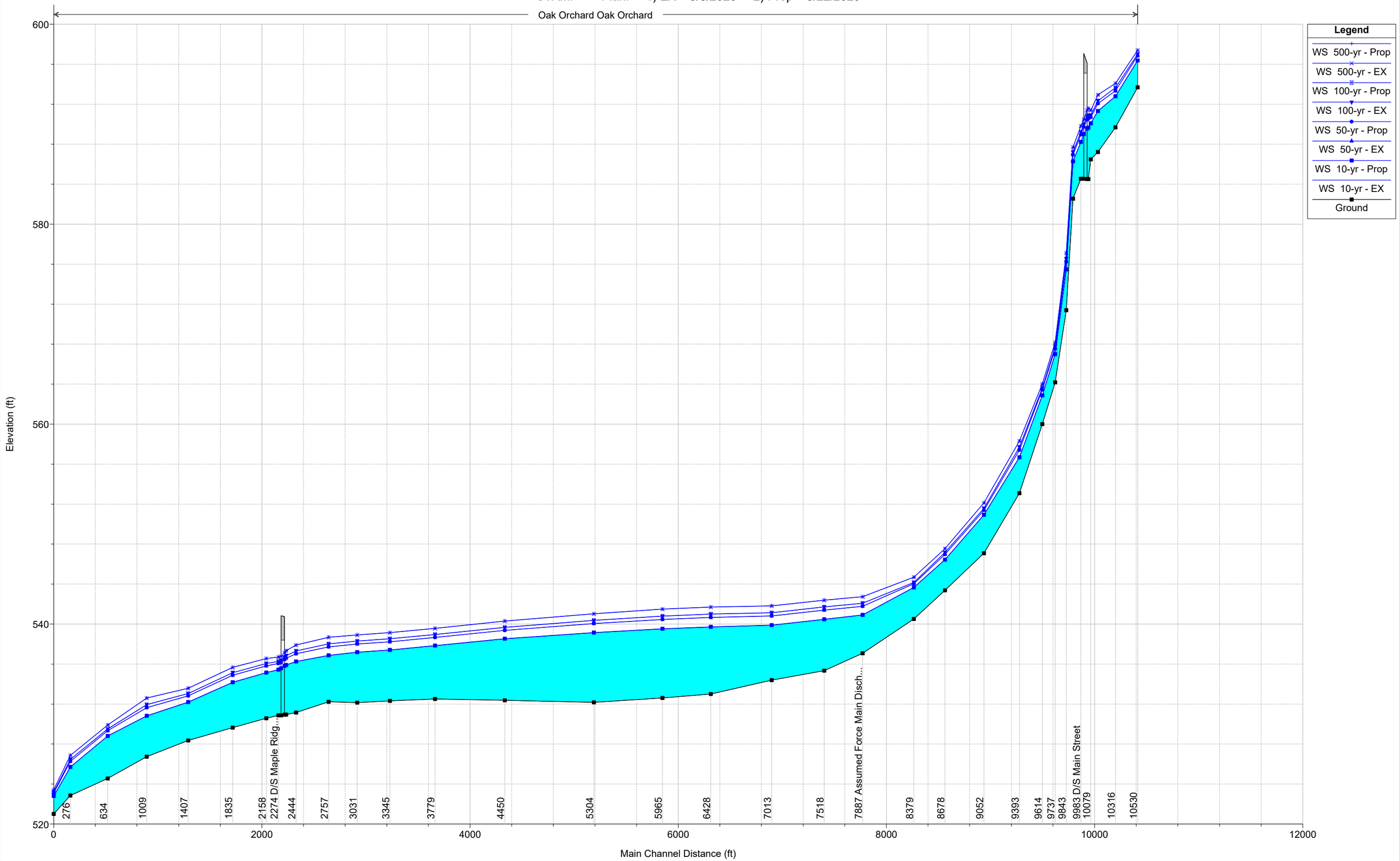
Appendix D:

Hydraulic Model Documentation



STAMP Plan: 1) EX 5/8/2020 2) Prop 5/22/2020

Oak Orchard Oak Orchard



HEC-RAS River: Oak Orchard Reach: Oak Orchard Profile: 10-yr

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Oak Orchard	10530	10-yr	EX	1640.00	593.69	596.37	596.37	597.45	0.012167	8.58	226.95	116.41	0.96
Oak Orchard	10530	10-yr	Prop	1640.00	593.69	596.37	596.37	597.45	0.012167	8.58	226.95	116.41	0.96
Oak Orchard	10316	10-yr	EX	1640.00	589.69	592.79	592.79	594.05	0.011619	9.11	199.91	96.44	0.95
Oak Orchard	10316	10-yr	Prop	1640.00	589.69	592.79	592.79	594.05	0.011619	9.11	199.91	96.44	0.95
Oak Orchard	10148	10-yr	EX	1640.00	587.21	591.32	590.65	592.09	0.005214	7.49	294.38	100.71	0.67
Oak Orchard	10148	10-yr	Prop	1640.00	587.21	591.32	590.65	592.09	0.005214	7.49	294.38	100.71	0.67
Oak Orchard	10079	10-yr	EX	1640.00	586.48	590.09	590.09	591.47	0.013078	9.42	174.70	65.76	1.00
Oak Orchard	10079	10-yr	Prop	1640.00	586.48	590.09	590.09	591.47	0.013078	9.42	174.70	65.76	1.00
Oak Orchard	10055	10-yr	EX	1640.00	584.52	589.67	588.10	590.41	0.003634	6.90	239.34	53.09	0.56
Oak Orchard	10055	10-yr	Prop	1640.00	584.52	589.67	588.10	590.41	0.003634	6.90	239.34	53.09	0.56
Oak Orchard	10023			Bridge									
Oak Orchard	9983	10-yr	EX	1640.00	584.55	588.22	588.22	589.90	0.013286	10.37	158.10	47.59	1.00
Oak Orchard	9983	10-yr	Prop	1640.00	584.55	588.22	588.22	589.90	0.013286	10.37	158.10	47.59	1.00
Oak Orchard	9908	10-yr	EX	1640.00	582.56	586.28	586.28	587.80	0.011932	9.96	173.41	61.98	0.98
Oak Orchard	9908	10-yr	Prop	1640.00	582.56	586.28	586.28	587.80	0.011932	9.96	173.41	61.98	0.98
Oak Orchard	9843	10-yr	EX	1640.00	571.40	575.49	575.49	577.22	0.012500	10.55	155.99	47.17	1.00
Oak Orchard	9843	10-yr	Prop	1640.00	571.40	575.49	575.49	577.22	0.012500	10.55	155.99	47.17	1.00
Oak Orchard	9737	10-yr	EX	1640.00	564.18	567.00	567.00	568.27	0.013692	9.03	181.60	72.45	1.01
Oak Orchard	9737	10-yr	Prop	1640.00	564.18	567.00	567.00	568.27	0.013693	9.03	181.59	72.45	1.01
Oak Orchard	9614	10-yr	EX	1640.00	560.00	562.88	562.88	564.12	0.014080	8.92	183.87	75.54	1.01
Oak Orchard	9614	10-yr	Prop	1640.00	560.00	562.88	562.88	564.12	0.014072	8.92	183.90	75.54	1.01
Oak Orchard	9393	10-yr	EX	1640.00	553.09	556.69	556.69	558.32	0.013837	10.25	160.04	49.61	1.01
Oak Orchard	9393	10-yr	Prop	1640.00	553.09	556.69	556.69	558.32	0.013838	10.25	160.04	49.61	1.01
Oak Orchard	9052	10-yr	EX	1640.00	547.08	550.92	550.68	552.17	0.010439	8.96	182.95	58.37	0.89
Oak Orchard	9052	10-yr	Prop	1640.00	547.08	550.92	550.68	552.17	0.010444	8.97	182.93	58.37	0.89
Oak Orchard	8678	10-yr	EX	1640.00	543.37	546.44	546.44	547.56	0.014480	8.47	193.66	88.64	1.01
Oak Orchard	8678	10-yr	Prop	1640.00	543.37	546.44	546.44	547.56	0.014469	8.47	193.71	88.64	1.01
Oak Orchard	8379	10-yr	EX	1640.00	540.51	543.67	543.15	544.43	0.007289	6.99	240.42	110.50	0.74
Oak Orchard	8379	10-yr	Prop	1640.00	540.51	543.67	543.15	544.43	0.007270	6.99	240.66	110.62	0.74
Oak Orchard	7887	10-yr	EX	1640.00	537.08	540.90	539.90	541.56	0.004677	6.53	281.61	203.76	0.61
Oak Orchard	7887	10-yr	Prop	1649.30	537.08	540.92	539.91	541.57	0.004647	6.53	285.14	205.89	0.61
Oak Orchard	7518	10-yr	EX	1640.00	535.34	540.47		540.69	0.001105	3.80	483.69	192.29	0.31
Oak Orchard	7518	10-yr	Prop	1649.30	535.34	540.48		540.71	0.001107	3.81	486.84	193.37	0.31
Oak Orchard	7013	10-yr	EX	1640.00	534.39	539.89		540.14	0.001080	4.04	456.23	126.99	0.31
Oak Orchard	7013	10-yr	Prop	1649.30	534.39	539.90		540.15	0.001080	4.05	458.33	127.09	0.31
Oak Orchard	6428	10-yr	EX	1640.00	533.00	539.71		539.80	0.000289	2.45	899.02	369.86	0.17
Oak Orchard	6428	10-yr	Prop	1649.30	533.00	539.72		539.81	0.000289	2.45	905.30	370.20	0.17
Oak Orchard	5965	10-yr	EX	1640.00	532.61	539.52		539.63	0.000422	2.91	832.84	271.52	0.21
Oak Orchard	5965	10-yr	Prop	1649.30	532.61	539.53		539.65	0.000422	2.91	837.43	271.63	0.21
Oak Orchard	5304	10-yr	EX	1640.00	532.17	539.14		539.31	0.000575	3.50	656.86	147.38	0.24
Oak Orchard	5304	10-yr	Prop	1649.30	532.17	539.16		539.33	0.000576	3.50	659.23	147.45	0.24
Oak Orchard	4450	10-yr	EX	1640.00	532.38	538.53		538.73	0.000810	3.83	595.57	153.42	0.28
Oak Orchard	4450	10-yr	Prop	1649.30	532.38	538.54		538.74	0.000811	3.84	597.87	153.59	0.28
Oak Orchard	3779	10-yr	EX	1640.00	532.50	537.84		538.07	0.001214	4.21	557.10	169.68	0.33
Oak Orchard	3779	10-yr	Prop	1649.30	532.50	537.85		538.09	0.001214	4.21	559.58	169.80	0.33
Oak Orchard	3345	10-yr	EX	1640.00	532.32	537.40		537.59	0.000975	3.65	575.92	166.49	0.30
Oak Orchard	3345	10-yr	Prop	1649.30	532.32	537.42		537.60	0.000975	3.65	578.36	166.57	0.30
Oak Orchard	3031	10-yr	EX	1640.00	532.14	537.18		537.33	0.000665	3.10	569.94	140.55	0.25
Oak Orchard	3031	10-yr	Prop	1649.30	532.14	537.20		537.34	0.000666	3.10	571.98	140.60	0.25
Oak Orchard	2757	10-yr	EX	1640.00	532.23	536.86		537.08	0.001245	4.03	587.57	234.09	0.33
Oak Orchard	2757	10-yr	Prop	1649.30	532.23	536.87		537.09	0.001242	4.03	591.08	234.42	0.33
Oak Orchard	2444	10-yr	EX	1640.00	531.15	536.25		536.60	0.001809	4.75	356.00	91.60	0.40

HEC-RAS River: Oak Orchard Reach: Oak Orchard Profile: 10-yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Oak Orchard	2444	10-yr	Prop	1649.30	531.15	536.27		536.62	0.001811	4.76	357.26	91.67	0.40
Oak Orchard	2349	10-yr	EX	1640.00	530.94	535.90	534.12	536.39	0.002464	5.68	308.64	77.57	0.47
Oak Orchard	2349	10-yr	Prop	1649.30	530.94	535.91	534.13	536.40	0.002469	5.70	309.56	77.60	0.47
Oak Orchard	2316			Bridge									
Oak Orchard	2274	10-yr	EX	1640.00	530.87	535.43		536.12	0.004529	6.65	255.07	125.68	0.61
Oak Orchard	2274	10-yr	Prop	1649.30	530.87	535.45		536.13	0.004532	6.66	255.94	125.89	0.62
Oak Orchard	2158	10-yr	EX	1640.00	530.58	535.14	533.85	535.68	0.003080	6.13	346.01	150.02	0.51
Oak Orchard	2158	10-yr	Prop	1649.30	530.58	535.15	533.87	535.69	0.003082	6.14	347.52	150.49	0.52
Oak Orchard	1835	10-yr	EX	1640.00	529.64	534.18		534.69	0.002965	5.95	363.15	158.43	0.51
Oak Orchard	1835	10-yr	Prop	1649.30	529.64	534.19		534.70	0.002963	5.96	365.15	158.61	0.51
Oak Orchard	1407	10-yr	EX	1640.00	528.35	532.18		532.96	0.005573	7.17	255.20	105.14	0.68
Oak Orchard	1407	10-yr	Prop	1649.30	528.35	532.19		532.98	0.005573	7.19	256.35	105.21	0.68
Oak Orchard	1009	10-yr	EX	1640.00	526.74	530.81		531.27	0.003027	5.48	320.23	117.37	0.50
Oak Orchard	1009	10-yr	Prop	1649.30	526.74	530.82		531.28	0.003020	5.49	321.92	117.44	0.50
Oak Orchard	634	10-yr	EX	1640.00	524.56	528.81		529.73	0.005486	7.80	230.13	71.08	0.69
Oak Orchard	634	10-yr	Prop	1649.30	524.56	528.81		529.74	0.005504	7.82	230.79	71.12	0.69
Oak Orchard	276	10-yr	EX	1640.00	522.85	525.70	525.70	526.90	0.012151	8.81	196.44	107.80	0.95
Oak Orchard	276	10-yr	Prop	1649.30	522.85	525.71	525.71	526.91	0.012112	8.81	197.66	108.08	0.95
Oak Orchard	116	10-yr	EX	1640.00	521.01	522.80	522.80	523.48	0.016517	6.66	246.39	182.49	1.01
Oak Orchard	116	10-yr	Prop	1649.30	521.01	522.80	522.80	523.49	0.016488	6.67	247.37	182.50	1.01

HEC-RAS River: Oak Orchard Reach: Oak Orchard Profile: 50-yr

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Oak Orchard	10530	50-yr	EX	2200.00	593.69	596.85	596.85	598.13	0.011667	9.45	283.74	120.21	0.97
Oak Orchard	10530	50-yr	Prop	2200.00	593.69	596.85	596.85	598.13	0.011667	9.45	283.74	120.21	0.97
Oak Orchard	10316	50-yr	EX	2200.00	589.69	593.34	593.34	594.84	0.011134	10.04	259.95	121.65	0.96
Oak Orchard	10316	50-yr	Prop	2200.00	589.69	593.34	593.34	594.84	0.011134	10.04	259.95	121.65	0.96
Oak Orchard	10148	50-yr	EX	2200.00	587.21	592.07		592.95	0.004912	8.17	369.84	102.70	0.67
Oak Orchard	10148	50-yr	Prop	2200.00	587.21	592.07		592.95	0.004912	8.17	369.84	102.70	0.67
Oak Orchard	10079	50-yr	EX	2200.00	586.48	590.70	590.70	592.35	0.012026	10.33	215.40	67.91	0.99
Oak Orchard	10079	50-yr	Prop	2200.00	586.48	590.70	590.70	592.35	0.012026	10.33	215.40	67.91	0.99
Oak Orchard	10055	50-yr	EX	2200.00	584.52	590.57	588.84	591.50	0.003648	7.77	288.24	55.14	0.58
Oak Orchard	10055	50-yr	Prop	2200.00	584.52	590.57	588.84	591.50	0.003648	7.77	288.24	55.14	0.58
Oak Orchard	10023			Bridge									
Oak Orchard	9983	50-yr	EX	2200.00	584.55	588.95	588.95	590.97	0.012416	11.41	193.60	50.53	1.00
Oak Orchard	9983	50-yr	Prop	2200.00	584.55	588.95	588.95	590.97	0.012416	11.41	193.60	50.53	1.00
Oak Orchard	9908	50-yr	EX	2200.00	582.56	586.94	586.94	588.77	0.011249	10.97	214.95	63.40	0.99
Oak Orchard	9908	50-yr	Prop	2200.00	582.56	586.94	586.94	588.77	0.011249	10.97	214.95	63.40	0.99
Oak Orchard	9843	50-yr	EX	2200.00	571.40	576.25	576.25	578.33	0.011527	11.57	192.76	49.67	1.00
Oak Orchard	9843	50-yr	Prop	2200.00	571.40	576.25	576.25	578.33	0.011527	11.57	192.76	49.67	1.00
Oak Orchard	9737	50-yr	EX	2200.00	564.18	567.56	567.56	569.08	0.012985	9.88	222.77	74.45	1.01
Oak Orchard	9737	50-yr	Prop	2200.00	564.18	567.56	567.56	569.08	0.012985	9.88	222.77	74.45	1.01
Oak Orchard	9614	50-yr	EX	2200.00	560.00	563.43	563.43	564.91	0.013135	9.76	225.33	76.08	1.00
Oak Orchard	9614	50-yr	Prop	2200.00	560.00	563.43	563.43	564.91	0.013135	9.76	225.33	76.08	1.00
Oak Orchard	9393	50-yr	EX	2200.00	553.09	557.42	557.42	559.36	0.013287	11.18	196.85	51.30	1.01
Oak Orchard	9393	50-yr	Prop	2200.00	553.09	557.42	557.42	559.36	0.013287	11.18	196.85	51.30	1.01
Oak Orchard	9052	50-yr	EX	2200.00	547.08	551.38	551.33	553.09	0.012236	10.50	209.44	58.85	0.98
Oak Orchard	9052	50-yr	Prop	2200.00	547.08	551.38	551.33	553.09	0.012241	10.51	209.42	58.85	0.98
Oak Orchard	8678	50-yr	EX	2200.00	543.37	546.97	546.94	548.27	0.012858	9.14	242.11	100.17	0.98
Oak Orchard	8678	50-yr	Prop	2200.00	543.37	546.97	546.94	548.27	0.012883	9.14	241.95	100.12	0.98
Oak Orchard	8379	50-yr	EX	2200.00	540.51	544.04	543.69	545.08	0.008610	8.21	295.81	225.47	0.82
Oak Orchard	8379	50-yr	Prop	2200.00	540.51	544.04	543.69	545.08	0.008590	8.20	296.29	226.34	0.82
Oak Orchard	7887	50-yr	EX	2200.00	537.08	541.77		542.37	0.003501	6.52	470.97	230.32	0.55
Oak Orchard	7887	50-yr	Prop	2209.30	537.08	541.78		542.39	0.003485	6.51	474.12	230.84	0.55
Oak Orchard	7518	50-yr	EX	2200.00	535.34	541.39		541.64	0.001009	4.10	666.93	203.00	0.31
Oak Orchard	7518	50-yr	Prop	2209.30	535.34	541.40		541.65	0.001008	4.10	669.81	203.11	0.31
Oak Orchard	7013	50-yr	EX	2200.00	534.39	540.80		541.11	0.001090	4.52	580.07	191.84	0.32
Oak Orchard	7013	50-yr	Prop	2209.30	534.39	540.82		541.12	0.001091	4.52	582.84	199.24	0.32
Oak Orchard	6428	50-yr	EX	2200.00	533.00	540.65		540.75	0.000287	2.67	1263.54	398.68	0.17
Oak Orchard	6428	50-yr	Prop	2209.30	533.00	540.67		540.77	0.000287	2.68	1269.37	399.93	0.17
Oak Orchard	5965	50-yr	EX	2200.00	532.61	540.46		540.59	0.000416	3.17	1092.45	279.99	0.21
Oak Orchard	5965	50-yr	Prop	2209.30	532.61	540.47		540.60	0.000416	3.18	1096.52	280.14	0.21
Oak Orchard	5304	50-yr	EX	2200.00	532.17	540.04		540.25	0.000636	4.00	791.10	151.39	0.26
Oak Orchard	5304	50-yr	Prop	2209.30	532.17	540.06		540.27	0.000637	4.01	793.20	151.45	0.26
Oak Orchard	4450	50-yr	EX	2200.00	532.38	539.37		539.62	0.000879	4.35	727.20	159.92	0.29
Oak Orchard	4450	50-yr	Prop	2209.30	532.38	539.38		539.63	0.000880	4.36	729.28	159.99	0.29
Oak Orchard	3779	50-yr	EX	2200.00	532.50	538.65		538.93	0.001213	4.65	697.91	175.21	0.34
Oak Orchard	3779	50-yr	Prop	2209.30	532.50	538.67		538.95	0.001213	4.66	700.16	175.29	0.34
Oak Orchard	3345	50-yr	EX	2200.00	532.32	538.22		538.45	0.000968	4.05	714.40	170.54	0.30
Oak Orchard	3345	50-yr	Prop	2209.30	532.32	538.24		538.46	0.000968	4.05	716.61	170.60	0.30
Oak Orchard	3031	50-yr	EX	2200.00	532.14	537.99		538.18	0.000699	3.52	685.48	143.45	0.26
Oak Orchard	3031	50-yr	Prop	2209.30	532.14	538.01		538.20	0.000700	3.53	687.32	143.50	0.26
Oak Orchard	2757	50-yr	EX	2200.00	532.23	537.70		537.94	0.001120	4.28	797.98	273.01	0.33
Oak Orchard	2757	50-yr	Prop	2209.30	532.23	537.72		537.95	0.001118	4.29	801.63	274.42	0.33
Oak Orchard	2444	50-yr	EX	2200.00	531.15	537.03		537.47	0.001887	5.40	428.32	95.50	0.42

HEC-RAS River: Oak Orchard Reach: Oak Orchard Profile: 50-yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Oak Orchard	2444	50-yr	Prop	2209.30	531.15	537.04		537.49	0.001888	5.41	429.48	95.56	0.42
Oak Orchard	2349	50-yr	EX	2200.00	530.94	536.58	534.74	537.24	0.002754	6.59	360.75	79.47	0.51
Oak Orchard	2349	50-yr	Prop	2209.30	530.94	536.59	534.75	537.25	0.002758	6.60	361.57	79.50	0.51
Oak Orchard	2316			Bridge									
Oak Orchard	2274	50-yr	EX	2200.00	530.87	536.05		536.93	0.004779	7.58	302.59	132.07	0.65
Oak Orchard	2274	50-yr	Prop	2209.30	530.87	536.06		536.95	0.004785	7.59	303.30	132.15	0.65
Oak Orchard	2158	50-yr	EX	2200.00	530.58	535.81	534.57	536.47	0.003202	6.87	430.40	195.21	0.54
Oak Orchard	2158	50-yr	Prop	2209.30	530.58	535.82	534.58	536.48	0.003204	6.89	431.69	195.78	0.54
Oak Orchard	1835	50-yr	EX	2200.00	529.64	534.88		535.46	0.002891	6.50	478.48	170.65	0.51
Oak Orchard	1835	50-yr	Prop	2209.30	529.64	534.89		535.47	0.002890	6.51	480.33	170.84	0.51
Oak Orchard	1407	50-yr	EX	2200.00	528.35	532.81		533.76	0.005501	7.97	322.65	108.50	0.69
Oak Orchard	1407	50-yr	Prop	2209.30	528.35	532.82		533.77	0.005499	7.98	323.74	108.54	0.69
Oak Orchard	1009	50-yr	EX	2200.00	526.74	531.63		532.15	0.002671	5.89	418.45	121.14	0.49
Oak Orchard	1009	50-yr	Prop	2209.30	526.74	531.64		532.17	0.002667	5.90	420.00	121.20	0.49
Oak Orchard	634	50-yr	EX	2200.00	524.56	529.33		530.59	0.006440	9.16	267.87	73.16	0.76
Oak Orchard	634	50-yr	Prop	2209.30	524.56	529.34		530.61	0.006451	9.18	268.51	73.19	0.76
Oak Orchard	276	50-yr	EX	2200.00	522.85	526.27	526.27	527.64	0.010985	9.52	260.07	114.19	0.94
Oak Orchard	276	50-yr	Prop	2209.30	522.85	526.27	526.27	527.65	0.010982	9.54	260.97	114.24	0.94
Oak Orchard	116	50-yr	EX	2200.00	521.01	523.09	523.09	523.92	0.015466	7.32	300.42	183.33	1.01
Oak Orchard	116	50-yr	Prop	2209.30	521.01	523.10	523.10	523.93	0.015456	7.33	301.24	183.34	1.01

HEC-RAS River: Oak Orchard Reach: Oak Orchard Profile: 100-yr

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Oak Orchard	10530	100-yr	EX	2420.00	593.69	597.02	597.02	598.38	0.011570	9.76	304.27	121.41	0.97
Oak Orchard	10530	100-yr	Prop	2420.00	593.69	597.02	597.02	598.38	0.011570	9.76	304.27	121.41	0.97
Oak Orchard	10316	100-yr	EX	2420.00	589.69	593.65	593.65	595.12	0.009826	9.99	298.35	126.82	0.92
Oak Orchard	10316	100-yr	Prop	2420.00	589.69	593.65	593.65	595.12	0.009826	9.99	298.35	126.82	0.92
Oak Orchard	10148	100-yr	EX	2420.00	587.21	592.35		593.27	0.004777	8.38	399.05	103.41	0.67
Oak Orchard	10148	100-yr	Prop	2420.00	587.21	592.35		593.27	0.004777	8.38	399.05	103.41	0.67
Oak Orchard	10079	100-yr	EX	2420.00	586.48	590.90	590.90	592.68	0.011925	10.70	229.40	68.83	1.00
Oak Orchard	10079	100-yr	Prop	2420.00	586.48	590.90	590.90	592.68	0.011925	10.70	229.40	68.83	1.00
Oak Orchard	10055	100-yr	EX	2420.00	584.52	590.89	589.08	591.90	0.003659	8.07	306.06	55.77	0.58
Oak Orchard	10055	100-yr	Prop	2420.00	584.52	590.89	589.08	591.90	0.003659	8.07	306.06	55.77	0.58
Oak Orchard	10023			Bridge									
Oak Orchard	9983	100-yr	EX	2420.00	584.55	589.22	589.22	591.37	0.012073	11.76	207.52	51.66	1.00
Oak Orchard	9983	100-yr	Prop	2420.00	584.55	589.22	589.22	591.37	0.012073	11.76	207.52	51.66	1.00
Oak Orchard	9908	100-yr	EX	2420.00	582.56	587.20	587.20	589.13	0.010878	11.27	231.54	63.95	0.98
Oak Orchard	9908	100-yr	Prop	2420.00	582.56	587.20	587.20	589.13	0.010878	11.27	231.54	63.95	0.98
Oak Orchard	9843	100-yr	EX	2420.00	571.40	576.53	576.53	578.73	0.011267	11.94	206.50	50.43	1.00
Oak Orchard	9843	100-yr	Prop	2420.00	571.40	576.53	576.53	578.73	0.011267	11.94	206.50	50.43	1.00
Oak Orchard	9737	100-yr	EX	2420.00	564.18	567.77	567.77	569.37	0.012606	10.16	238.37	75.09	1.00
Oak Orchard	9737	100-yr	Prop	2420.00	564.18	567.77	567.77	569.37	0.012606	10.16	238.37	75.09	1.00
Oak Orchard	9614	100-yr	EX	2420.00	560.00	563.61	563.61	565.20	0.013067	10.11	239.47	76.27	1.01
Oak Orchard	9614	100-yr	Prop	2420.00	560.00	563.61	563.61	565.20	0.013067	10.11	239.47	76.27	1.01
Oak Orchard	9393	100-yr	EX	2420.00	553.09	557.70	557.70	559.74	0.013064	11.45	211.27	52.25	1.00
Oak Orchard	9393	100-yr	Prop	2420.00	553.09	557.70	557.70	559.74	0.013066	11.46	211.26	52.25	1.00
Oak Orchard	9052	100-yr	EX	2420.00	547.08	551.56	551.56	553.44	0.012583	10.97	220.52	59.05	1.00
Oak Orchard	9052	100-yr	Prop	2420.00	547.08	551.56	551.56	553.44	0.012581	10.97	220.53	59.05	1.00
Oak Orchard	8678	100-yr	EX	2420.00	543.37	547.16	547.12	548.52	0.012394	9.36	262.06	105.04	0.97
Oak Orchard	8678	100-yr	Prop	2420.00	543.37	547.16	547.12	548.52	0.012426	9.37	261.82	104.99	0.97
Oak Orchard	8379	100-yr	EX	2420.00	540.51	544.16	543.91	545.30	0.009115	8.64	326.14	271.65	0.85
Oak Orchard	8379	100-yr	Prop	2420.00	540.51	544.16	543.92	545.30	0.009086	8.64	326.90	272.14	0.84
Oak Orchard	7887	100-yr	EX	2420.00	537.08	542.08		542.66	0.003162	6.48	545.60	248.91	0.53
Oak Orchard	7887	100-yr	Prop	2429.30	537.08	542.09		542.68	0.003150	6.48	548.83	250.68	0.53
Oak Orchard	7518	100-yr	EX	2420.00	535.34	541.72		541.97	0.000982	4.20	733.45	205.56	0.30
Oak Orchard	7518	100-yr	Prop	2429.30	535.34	541.73		541.99	0.000981	4.20	736.19	205.66	0.30
Oak Orchard	7013	100-yr	EX	2420.00	534.39	541.13		541.45	0.001086	4.66	666.59	321.99	0.32
Oak Orchard	7013	100-yr	Prop	2429.30	534.39	541.14		541.46	0.001086	4.67	670.96	325.87	0.32
Oak Orchard	6428	100-yr	EX	2420.00	533.00	540.99		541.09	0.000285	2.74	1399.84	405.44	0.17
Oak Orchard	6428	100-yr	Prop	2429.30	533.00	541.01		541.11	0.000285	2.75	1405.46	405.68	0.17
Oak Orchard	5965	100-yr	EX	2420.00	532.61	540.80		540.93	0.000414	3.26	1187.28	282.64	0.21
Oak Orchard	5965	100-yr	Prop	2429.30	532.61	540.81		540.95	0.000414	3.27	1191.18	282.72	0.21
Oak Orchard	5304	100-yr	EX	2420.00	532.17	540.36		540.59	0.000657	4.18	839.85	153.12	0.26
Oak Orchard	5304	100-yr	Prop	2429.30	532.17	540.38		540.60	0.000658	4.19	841.87	153.20	0.26
Oak Orchard	4450	100-yr	EX	2420.00	532.38	539.67		539.93	0.000901	4.53	775.55	161.52	0.30
Oak Orchard	4450	100-yr	Prop	2429.30	532.38	539.68		539.95	0.000901	4.54	777.56	161.58	0.30
Oak Orchard	3779	100-yr	EX	2420.00	532.50	538.95		539.24	0.001213	4.81	749.99	177.62	0.34
Oak Orchard	3779	100-yr	Prop	2429.30	532.50	538.96		539.26	0.001213	4.81	752.17	177.73	0.34
Oak Orchard	3345	100-yr	EX	2420.00	532.32	538.52		538.76	0.000966	4.19	765.24	172.10	0.31
Oak Orchard	3345	100-yr	Prop	2429.30	532.32	538.53		538.77	0.000966	4.19	767.35	172.17	0.31
Oak Orchard	3031	100-yr	EX	2420.00	532.14	538.29		538.49	0.000710	3.67	727.85	144.80	0.26
Oak Orchard	3031	100-yr	Prop	2429.30	532.14	538.30		538.50	0.000711	3.67	729.61	144.85	0.27
Oak Orchard	2757	100-yr	EX	2420.00	532.23	538.01		538.25	0.001076	4.36	884.70	284.70	0.32
Oak Orchard	2757	100-yr	Prop	2429.30	532.23	538.03		538.27	0.001074	4.36	888.33	285.41	0.32
Oak Orchard	2444	100-yr	EX	2420.00	531.15	537.31		537.79	0.001910	5.62	455.30	96.84	0.42

HEC-RAS River: Oak Orchard Reach: Oak Orchard Profile: 100-yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Oak Orchard	2444	100-yr	Prop	2429.30	531.15	537.32		537.80	0.001910	5.63	456.43	96.90	0.42
Oak Orchard	2349	100-yr	EX	2420.00	530.94	536.83	534.96	537.55	0.002850	6.91	379.62	80.20	0.52
Oak Orchard	2349	100-yr	Prop	2429.30	530.94	536.84	534.97	537.56	0.002854	6.92	380.40	80.23	0.52
Oak Orchard	2316			Bridge									
Oak Orchard	2274	100-yr	EX	2420.00	530.87	536.26		537.23	0.004898	7.93	318.97	133.84	0.66
Oak Orchard	2274	100-yr	Prop	2429.30	530.87	536.27		537.24	0.004903	7.94	319.64	133.91	0.66
Oak Orchard	2158	100-yr	EX	2420.00	530.58	536.05	534.78	536.75	0.003249	7.14	460.64	203.08	0.55
Oak Orchard	2158	100-yr	Prop	2429.30	530.58	536.06	534.77	536.76	0.003251	7.15	461.88	203.32	0.55
Oak Orchard	1835	100-yr	EX	2420.00	529.64	535.13		535.73	0.002860	6.68	522.11	175.46	0.51
Oak Orchard	1835	100-yr	Prop	2429.30	529.64	535.14		535.75	0.002859	6.69	523.94	175.69	0.51
Oak Orchard	1407	100-yr	EX	2420.00	528.35	533.05		534.05	0.005424	8.21	348.69	109.43	0.69
Oak Orchard	1407	100-yr	Prop	2429.30	528.35	533.06		534.06	0.005421	8.22	349.78	109.47	0.69
Oak Orchard	1009	100-yr	EX	2420.00	526.74	531.94		532.48	0.002552	6.02	456.19	122.53	0.48
Oak Orchard	1009	100-yr	Prop	2429.30	526.74	531.95		532.50	0.002549	6.03	457.69	122.58	0.48
Oak Orchard	634	100-yr	EX	2420.00	524.56	529.50	528.93	530.92	0.006865	9.70	280.74	76.54	0.79
Oak Orchard	634	100-yr	Prop	2429.30	524.56	529.52	528.94	530.94	0.006820	9.70	282.26	77.03	0.79
Oak Orchard	276	100-yr	EX	2420.00	522.85	526.47	526.47	527.90	0.010621	9.76	283.82	115.50	0.93
Oak Orchard	276	100-yr	Prop	2429.30	522.85	526.47	526.47	527.91	0.010769	9.82	283.15	115.47	0.94
Oak Orchard	116	100-yr	EX	2420.00	521.01	523.20	523.20	524.09	0.015102	7.55	320.64	183.64	1.01
Oak Orchard	116	100-yr	Prop	2429.30	521.01	523.21	523.21	524.09	0.015109	7.56	321.35	183.65	1.01

HEC-RAS River: Oak Orchard Reach: Oak Orchard Profile: 500-yr

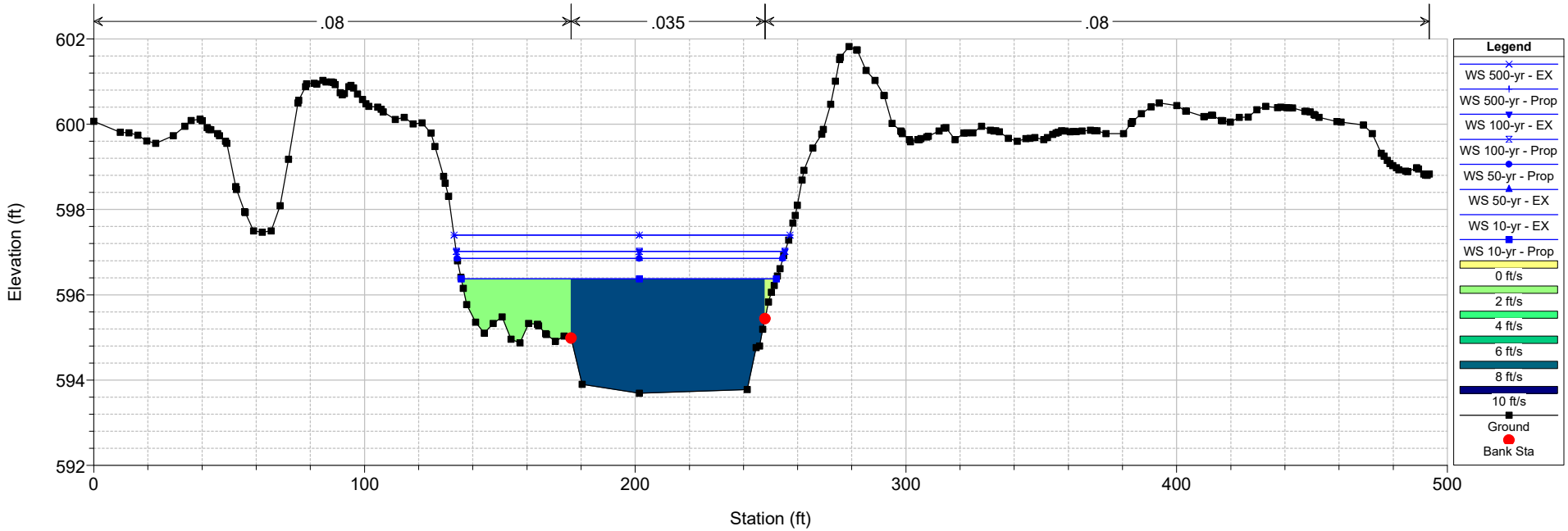
Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Oak Orchard	10530	500-yr	EX	2910.00	593.69	597.40	597.40	598.90	0.011150	10.34	350.65	124.05	0.97
Oak Orchard	10530	500-yr	Prop	2910.00	593.69	597.40	597.40	598.90	0.011150	10.34	350.65	124.05	0.97
Oak Orchard	10316	500-yr	EX	2910.00	589.69	594.08	594.08	595.68	0.009393	10.52	354.28	131.35	0.91
Oak Orchard	10316	500-yr	Prop	2910.00	589.69	594.08	594.08	595.68	0.009393	10.52	354.28	131.35	0.91
Oak Orchard	10148	500-yr	EX	2910.00	587.21	592.94		593.95	0.004554	8.83	460.69	104.79	0.67
Oak Orchard	10148	500-yr	Prop	2910.00	587.21	592.94		593.95	0.004554	8.83	460.69	104.79	0.67
Oak Orchard	10079	500-yr	EX	2910.00	586.48	591.37	591.37	593.37	0.011365	11.34	262.23	70.97	1.00
Oak Orchard	10079	500-yr	Prop	2910.00	586.48	591.37	591.37	593.37	0.011365	11.34	262.23	70.97	1.00
Oak Orchard	10055	500-yr	EX	2910.00	584.52	591.59	589.63	592.75	0.003657	8.68	344.44	57.16	0.59
Oak Orchard	10055	500-yr	Prop	2910.00	584.52	591.59	589.63	592.75	0.003657	8.68	344.44	57.16	0.59
Oak Orchard	10023			Bridge									
Oak Orchard	9983	500-yr	EX	2910.00	584.55	589.81	589.81	592.20	0.011341	12.41	238.74	54.10	0.99
Oak Orchard	9983	500-yr	Prop	2910.00	584.55	589.81	589.81	592.20	0.011341	12.41	238.74	54.10	0.99
Oak Orchard	9908	500-yr	EX	2910.00	582.56	587.70	587.70	589.89	0.010641	12.03	263.59	65.05	0.99
Oak Orchard	9908	500-yr	Prop	2910.00	582.56	587.70	587.70	589.89	0.010641	12.03	263.59	65.05	0.99
Oak Orchard	9843	500-yr	EX	2910.00	571.40	577.13	577.13	579.59	0.010595	12.61	237.63	51.87	0.99
Oak Orchard	9843	500-yr	Prop	2910.00	571.40	577.13	577.13	579.59	0.010595	12.61	237.63	51.87	0.99
Oak Orchard	9737	500-yr	EX	2910.00	564.18	568.20	568.20	570.00	0.012234	10.76	270.97	77.32	1.00
Oak Orchard	9737	500-yr	Prop	2910.00	564.18	568.20	568.20	570.00	0.012234	10.76	270.97	77.32	1.00
Oak Orchard	9614	500-yr	EX	2910.00	560.00	564.03	564.03	565.82	0.012686	10.73	271.13	76.68	1.01
Oak Orchard	9614	500-yr	Prop	2910.00	560.00	564.03	564.03	565.82	0.012686	10.73	271.13	76.68	1.01
Oak Orchard	9393	500-yr	EX	2910.00	553.09	558.31	558.31	560.52	0.012555	11.92	244.86	62.77	1.00
Oak Orchard	9393	500-yr	Prop	2910.00	553.09	558.31	558.31	560.52	0.012555	11.92	244.86	62.77	1.00
Oak Orchard	9052	500-yr	EX	2910.00	547.08	552.12	552.12	554.16	0.012540	11.45	254.07	63.40	1.01
Oak Orchard	9052	500-yr	Prop	2910.00	547.08	552.12	552.12	554.16	0.012540	11.45	254.07	63.40	1.01
Oak Orchard	8678	500-yr	EX	2910.00	543.37	547.54	547.54	549.06	0.012027	9.93	302.65	115.71	0.97
Oak Orchard	8678	500-yr	Prop	2910.00	543.37	547.54	547.54	549.06	0.012027	9.93	302.65	115.71	0.97
Oak Orchard	8379	500-yr	EX	2910.00	540.51	544.70	544.70	545.72	0.007173	8.41	502.72	384.77	0.77
Oak Orchard	8379	500-yr	Prop	2910.00	540.51	544.70	544.70	545.72	0.007173	8.41	502.72	384.77	0.77
Oak Orchard	7887	500-yr	EX	2910.00	537.08	542.74		543.27	0.002594	6.41	719.90	269.62	0.49
Oak Orchard	7887	500-yr	Prop	2919.30	537.08	542.75		543.29	0.002587	6.41	722.91	269.69	0.49
Oak Orchard	7518	500-yr	EX	2910.00	535.34	542.39		542.66	0.000937	4.41	873.12	210.92	0.30
Oak Orchard	7518	500-yr	Prop	2919.30	535.34	542.40		542.67	0.000937	4.41	875.45	211.03	0.30
Oak Orchard	7013	500-yr	EX	2910.00	534.39	541.81		542.16	0.001061	4.92	949.48	466.79	0.32
Oak Orchard	7013	500-yr	Prop	2919.30	534.39	541.83		542.17	0.001059	4.92	955.49	467.15	0.32
Oak Orchard	6428	500-yr	EX	2910.00	533.00	541.70		541.80	0.000279	2.88	1689.39	418.19	0.17
Oak Orchard	6428	500-yr	Prop	2919.30	533.00	541.71		541.82	0.000279	2.88	1694.72	418.39	0.17
Oak Orchard	5965	500-yr	EX	2910.00	532.61	541.50		541.64	0.000410	3.45	1386.99	288.22	0.21
Oak Orchard	5965	500-yr	Prop	2919.30	532.61	541.51		541.66	0.000410	3.45	1390.67	288.35	0.21
Oak Orchard	5304	500-yr	EX	2910.00	532.17	541.03		541.29	0.000698	4.54	943.00	156.87	0.27
Oak Orchard	5304	500-yr	Prop	2919.30	532.17	541.04		541.31	0.000699	4.55	944.89	156.94	0.27
Oak Orchard	4450	500-yr	EX	2910.00	532.38	540.29		540.60	0.000942	4.90	877.98	165.13	0.31
Oak Orchard	4450	500-yr	Prop	2919.30	532.38	540.31		540.61	0.000943	4.91	879.85	165.19	0.31
Oak Orchard	3779	500-yr	EX	2910.00	532.50	539.57		539.89	0.001212	5.12	861.17	182.47	0.35
Oak Orchard	3779	500-yr	Prop	2919.30	532.50	539.58		539.91	0.001212	5.13	863.22	182.56	0.35
Oak Orchard	3345	500-yr	EX	2910.00	532.32	539.14		539.41	0.000964	4.48	875.89	189.65	0.31
Oak Orchard	3345	500-yr	Prop	2919.30	532.32	539.15		539.42	0.000964	4.48	878.04	194.43	0.31
Oak Orchard	3031	500-yr	EX	2910.00	532.14	538.90		539.14	0.000730	3.97	828.65	183.43	0.27
Oak Orchard	3031	500-yr	Prop	2919.30	532.14	538.92		539.15	0.000730	3.97	830.69	183.76	0.27
Oak Orchard	2757	500-yr	EX	2910.00	532.23	538.67		538.91	0.000985	4.49	1078.65	302.19	0.31
Oak Orchard	2757	500-yr	Prop	2919.30	532.23	538.68		538.92	0.000984	4.49	1082.25	302.26	0.31
Oak Orchard	2444	500-yr	EX	2910.00	531.15	537.89		538.46	0.001951	6.08	513.11	100.26	0.43

HEC-RAS River: Oak Orchard Reach: Oak Orchard Profile: 500-yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Oak Orchard	2444	500-yr	Prop	2919.30	531.15	537.90		538.47	0.001952	6.09	514.18	100.35	0.43
Oak Orchard	2349	500-yr	EX	2910.00	530.94	537.34	535.42	538.20	0.003045	7.57	418.97	82.11	0.54
Oak Orchard	2349	500-yr	Prop	2919.30	530.94	537.34	535.43	538.21	0.003049	7.58	419.68	82.15	0.54
Oak Orchard	2316			Bridge									
Oak Orchard	2274	500-yr	EX	2910.00	530.87	536.70		537.84	0.005171	8.66	352.25	139.54	0.69
Oak Orchard	2274	500-yr	Prop	2919.30	530.87	536.70		537.86	0.005177	8.68	352.84	139.65	0.69
Oak Orchard	2158	500-yr	EX	2910.00	530.58	536.55	535.20	537.34	0.003339	7.68	524.33	222.70	0.56
Oak Orchard	2158	500-yr	Prop	2919.30	530.58	536.56	535.21	537.36	0.003341	7.69	525.48	222.81	0.56
Oak Orchard	1835	500-yr	EX	2910.00	529.64	535.66		536.31	0.002792	7.04	619.37	191.39	0.52
Oak Orchard	1835	500-yr	Prop	2919.30	529.64	535.67		536.32	0.002790	7.04	621.24	191.68	0.52
Oak Orchard	1407	500-yr	EX	2910.00	528.35	533.57		534.67	0.005204	8.68	406.27	111.58	0.69
Oak Orchard	1407	500-yr	Prop	2919.30	528.35	533.58		534.68	0.005200	8.68	407.35	111.62	0.69
Oak Orchard	1009	500-yr	EX	2910.00	526.74	532.59		533.18	0.002347	6.29	537.34	125.48	0.47
Oak Orchard	1009	500-yr	Prop	2919.30	526.74	532.61		533.19	0.002343	6.29	538.84	125.53	0.47
Oak Orchard	634	500-yr	EX	2910.00	524.56	529.91	529.36	531.62	0.007477	10.69	314.48	89.93	0.83
Oak Orchard	634	500-yr	Prop	2919.30	524.56	529.91	529.37	531.63	0.007490	10.71	315.10	90.20	0.83
Oak Orchard	276	500-yr	EX	2910.00	522.85	526.86	526.86	528.46	0.010403	10.38	329.27	117.79	0.94
Oak Orchard	276	500-yr	Prop	2919.30	522.85	526.87	526.87	528.47	0.010394	10.39	330.17	117.84	0.94
Oak Orchard	116	500-yr	EX	2910.00	521.01	523.43	523.43	524.43	0.014569	8.02	362.66	184.29	1.01
Oak Orchard	116	500-yr	Prop	2919.30	521.01	523.43	523.43	524.44	0.014552	8.03	363.49	184.30	1.01

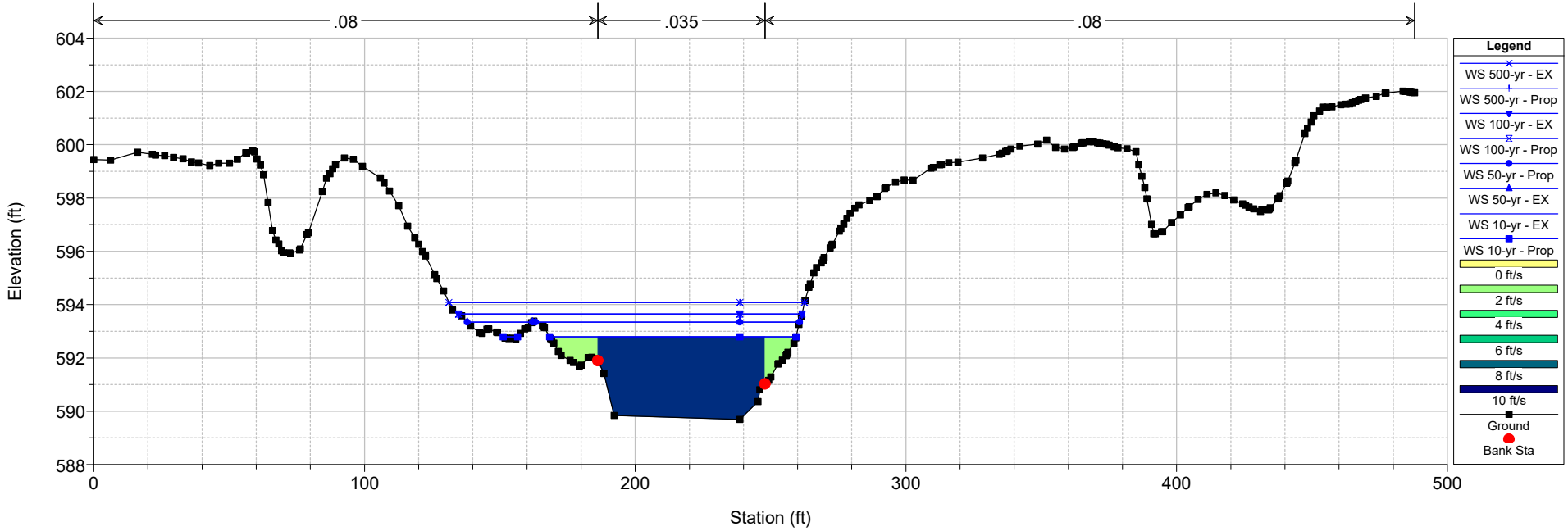
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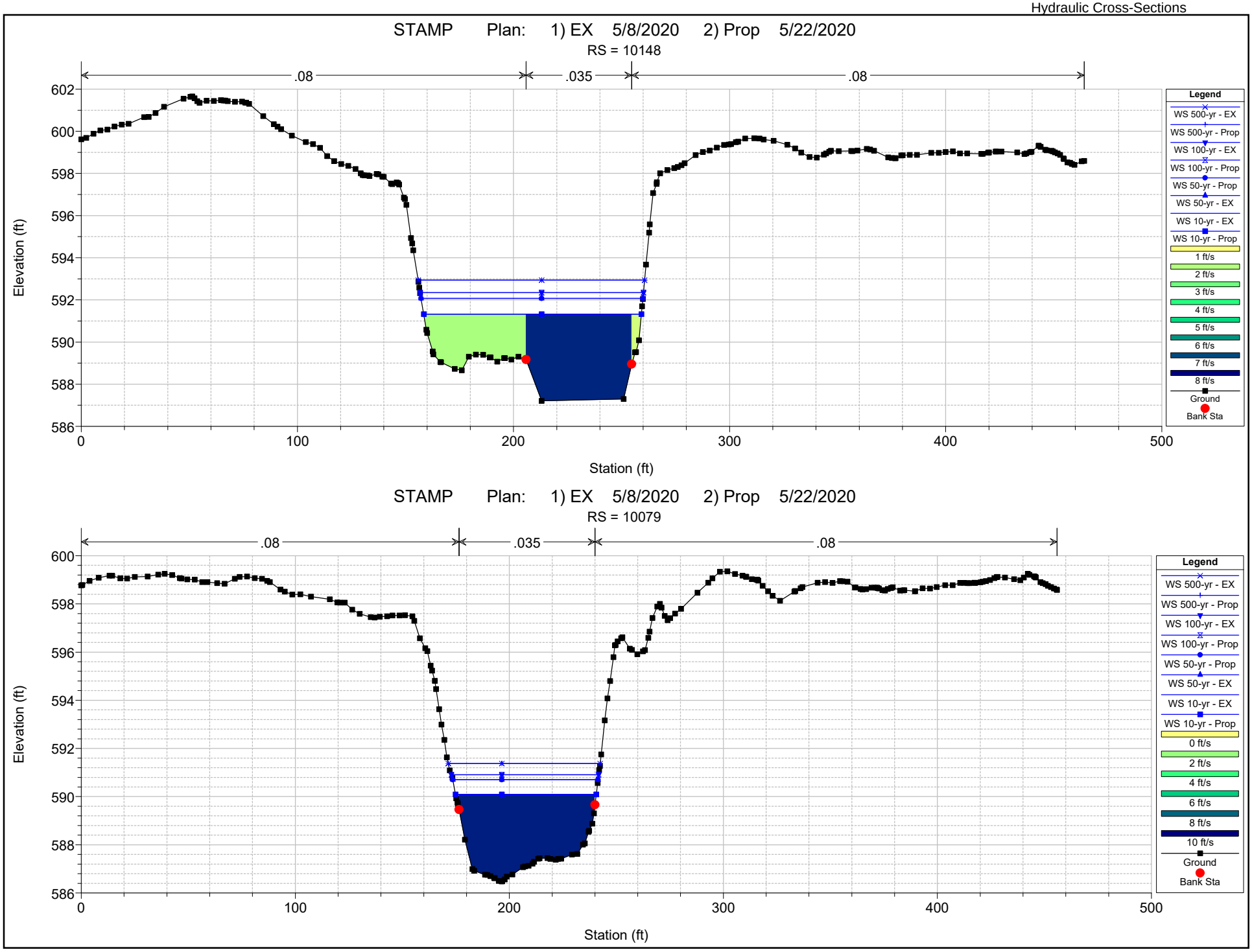
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STAMP Plan: 1) EX 5/8/2020 2) Prop 5/22/2020

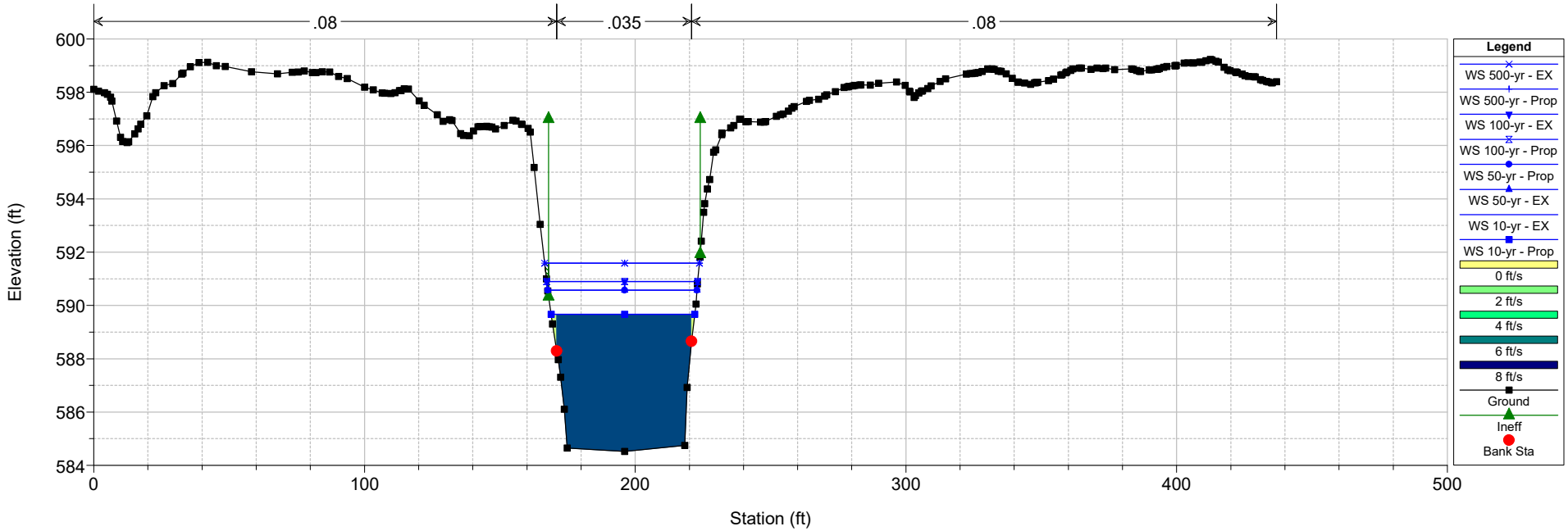
RS = 10316




STAMP Plan: 1) EX 5/8/2020 2) Prop 5/22/2020
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.08
.035
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Elevation (ft)
Station (ft)
Legend
WS 500-yr - EX
WS 500-yr - Prop
WS 100-yr - EX
WS 100-yr - Prop
WS 50-yr - Prop
WS 50-yr - EX
WS 10-yr - EX
WS 10-yr - Prop
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
7 ft/s
8 ft/s
Ground
Bank Sta
STAMP Plan: 1) EX 5/8/2020 2) Prop 5/22/2020
RS = 10079
.08
.035
.08
Elevation (ft)
Station (ft)
Legend
WS 500-yr - EX
WS 500-yr - Prop
WS 100-yr - EX
WS 100-yr - Prop
WS 50-yr - Prop
WS 50-yr - EX
WS 10-yr - EX
WS 10-yr - Prop
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
Ground
Bank Sta

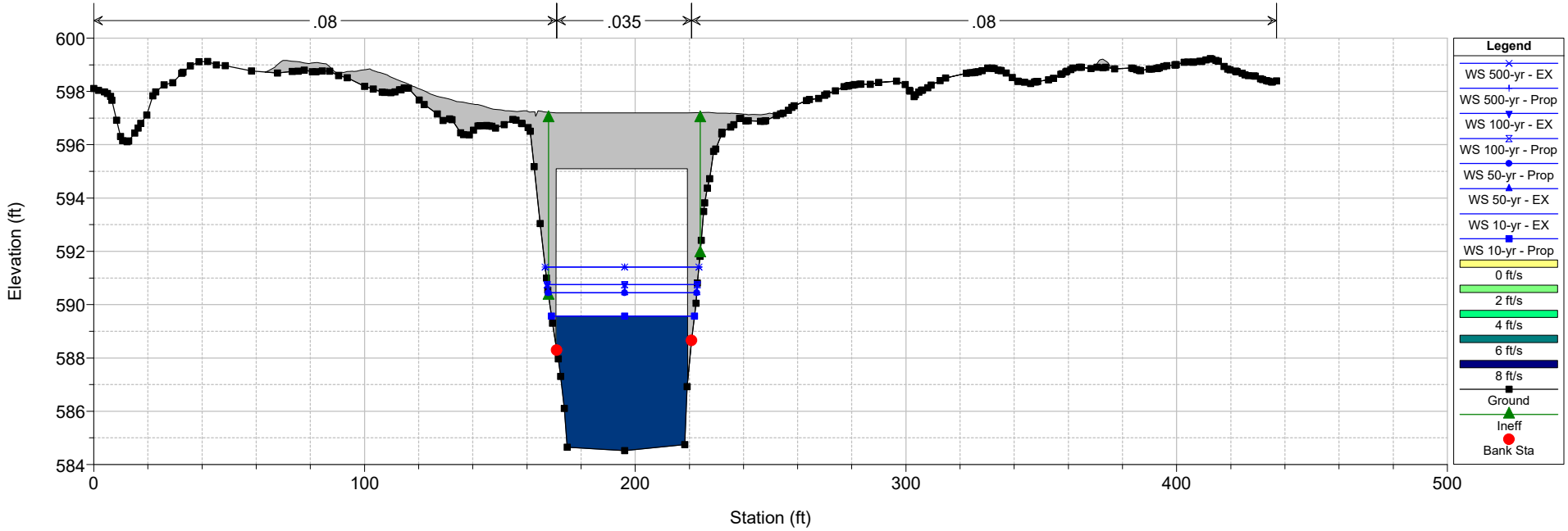
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RS = 10055 U/S Main Street



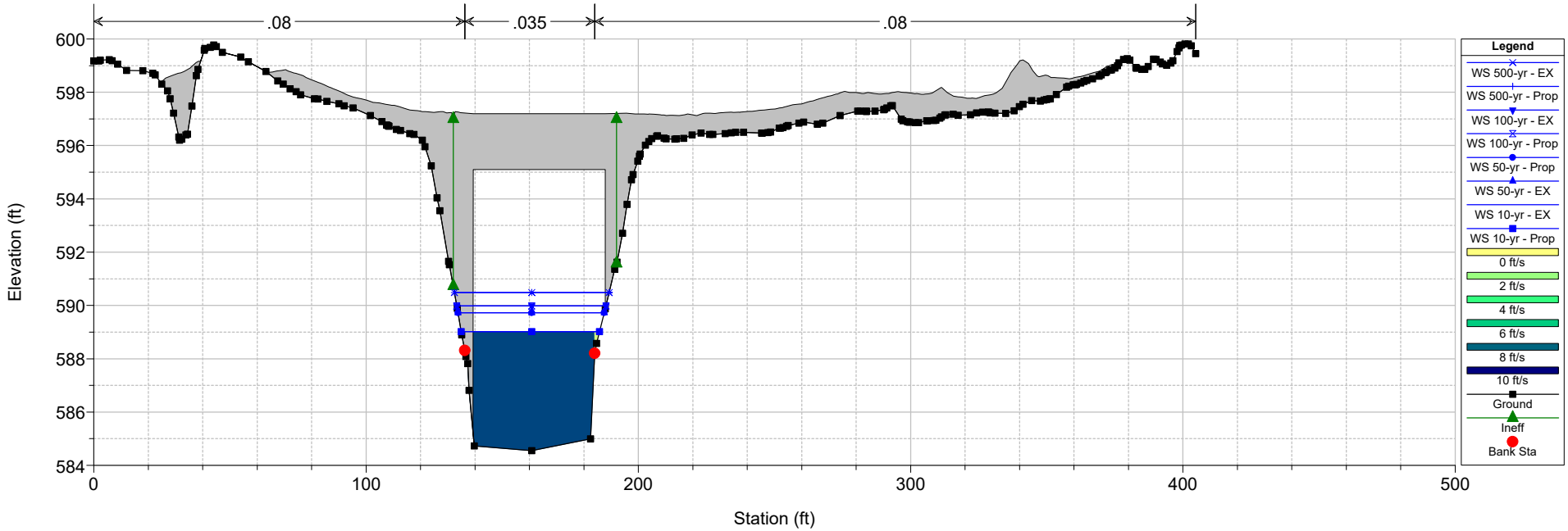
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RS = 10023 BR Main Street + Pipe Bridge + SKEWED



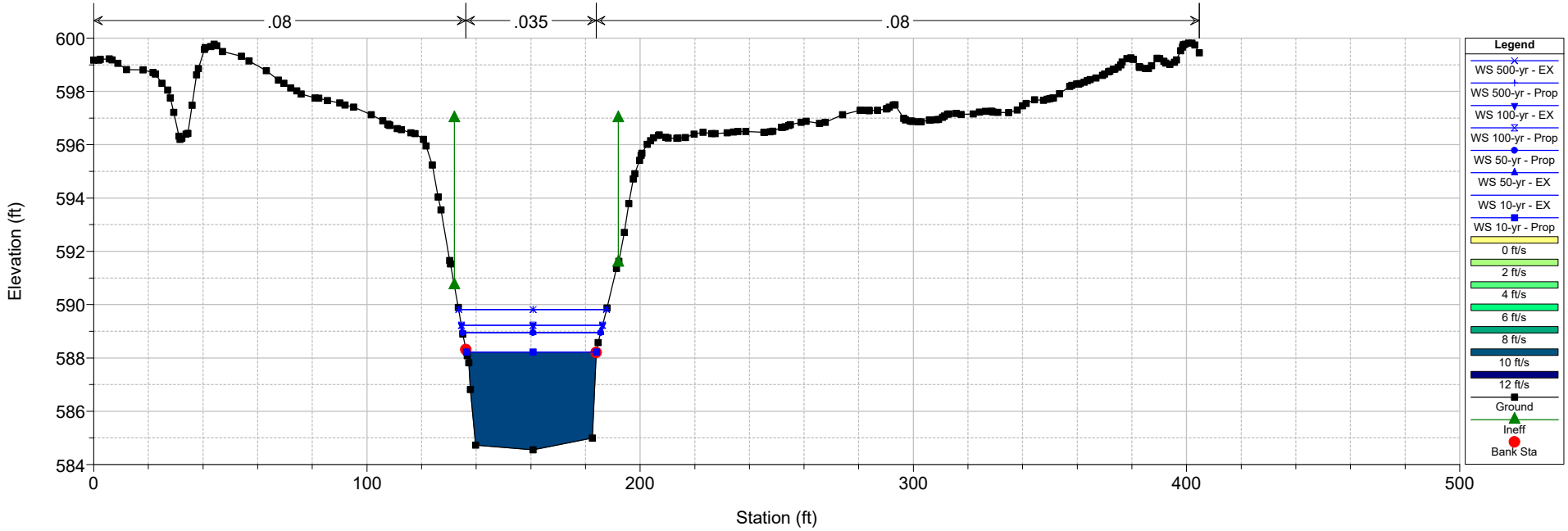
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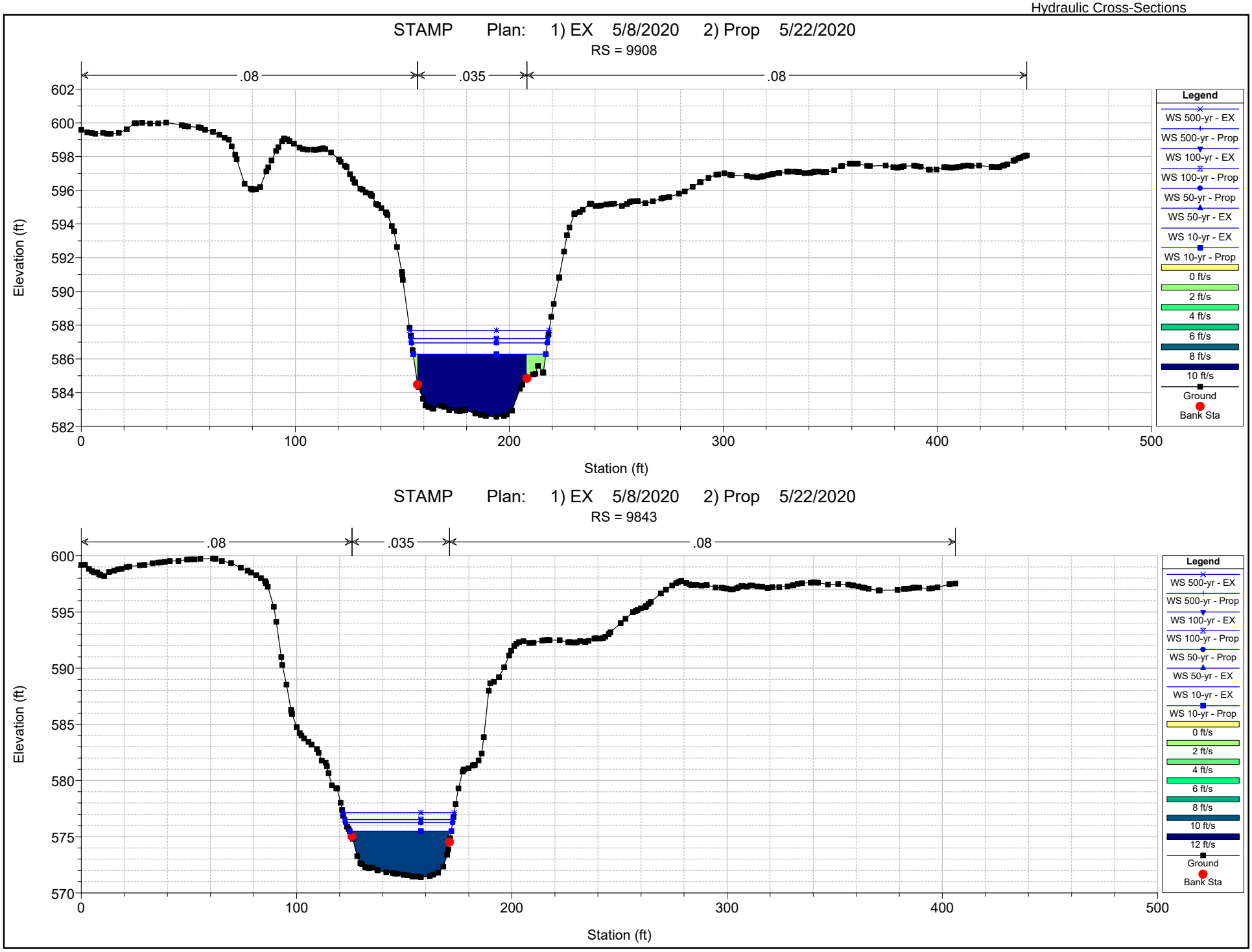
RS = 10023 BR Main Street + Pipe Bridge + SKEWED



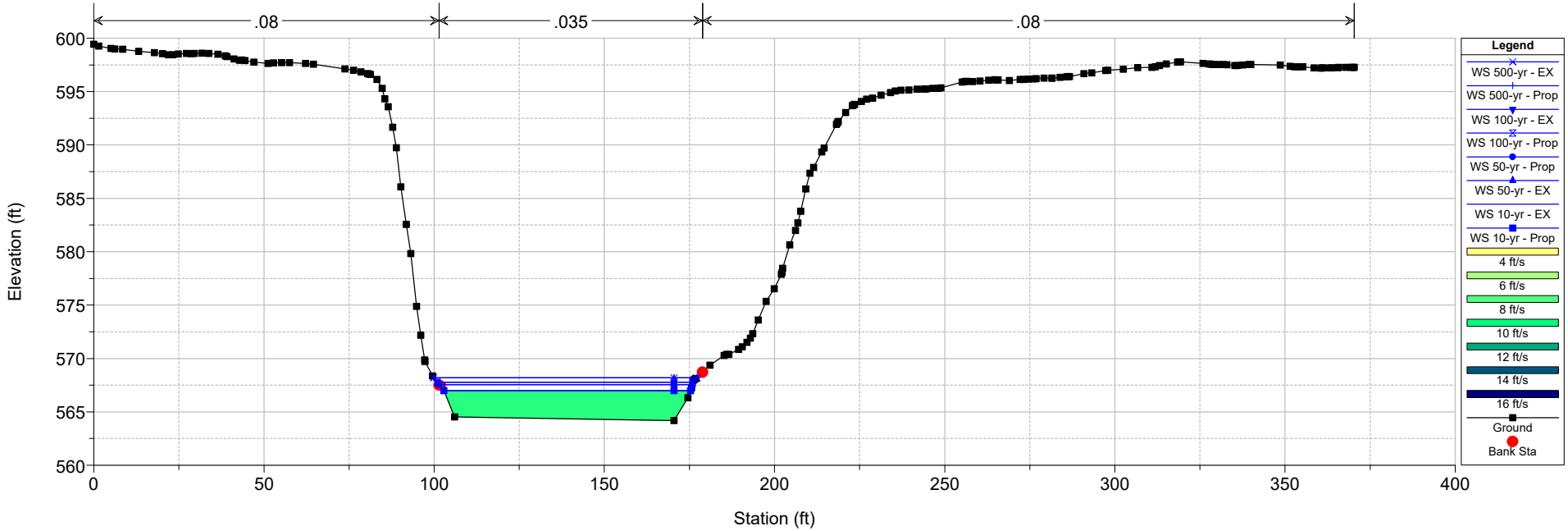
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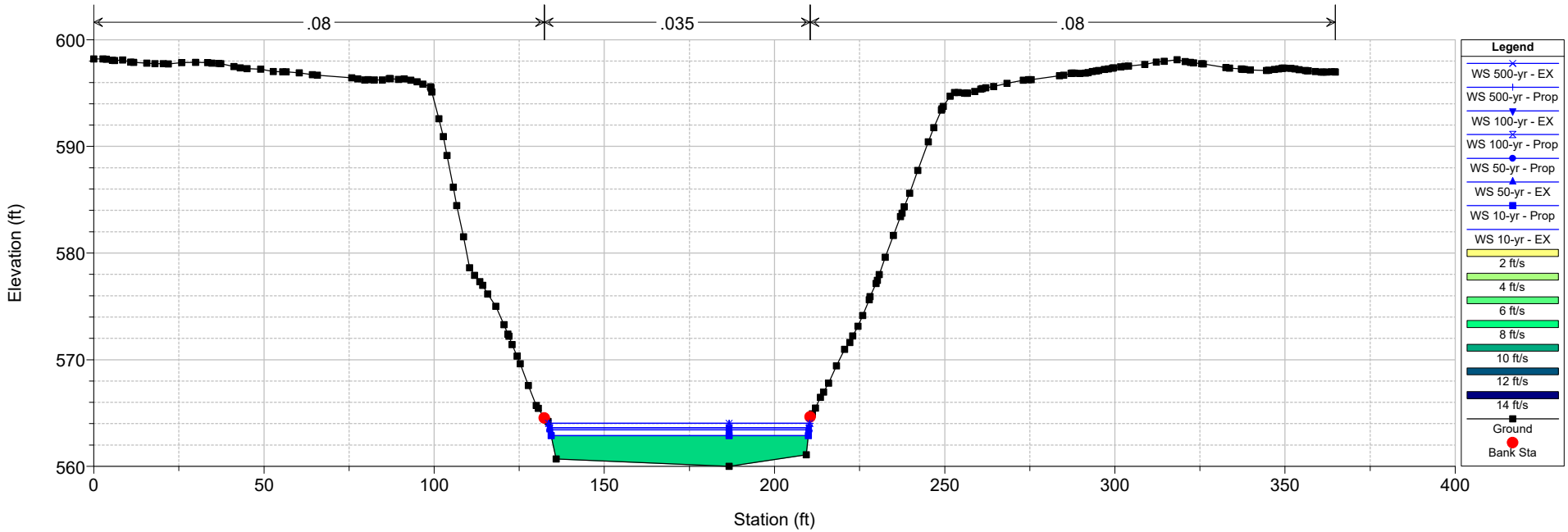



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.035
.08
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Station (ft)
Legend
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WS 500-yr - Prop
WS 100-yr - EX
WS 100-yr - Prop
WS 50-yr - Prop
WS 50-yr - EX
WS 10-yr - EX
WS 10-yr - Prop
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
Ground
Bank Sta
STAMP Plan: 1) EX 5/8/2020 2) Prop 5/22/2020
RS = 9843
.08
.035
.08
Elevation (ft)
Station (ft)
Legend
WS 500-yr - EX
WS 500-yr - Prop
WS 100-yr - EX
WS 100-yr - Prop
WS 50-yr - Prop
WS 50-yr - EX
WS 10-yr - EX
WS 10-yr - Prop
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4 ft/s
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8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta

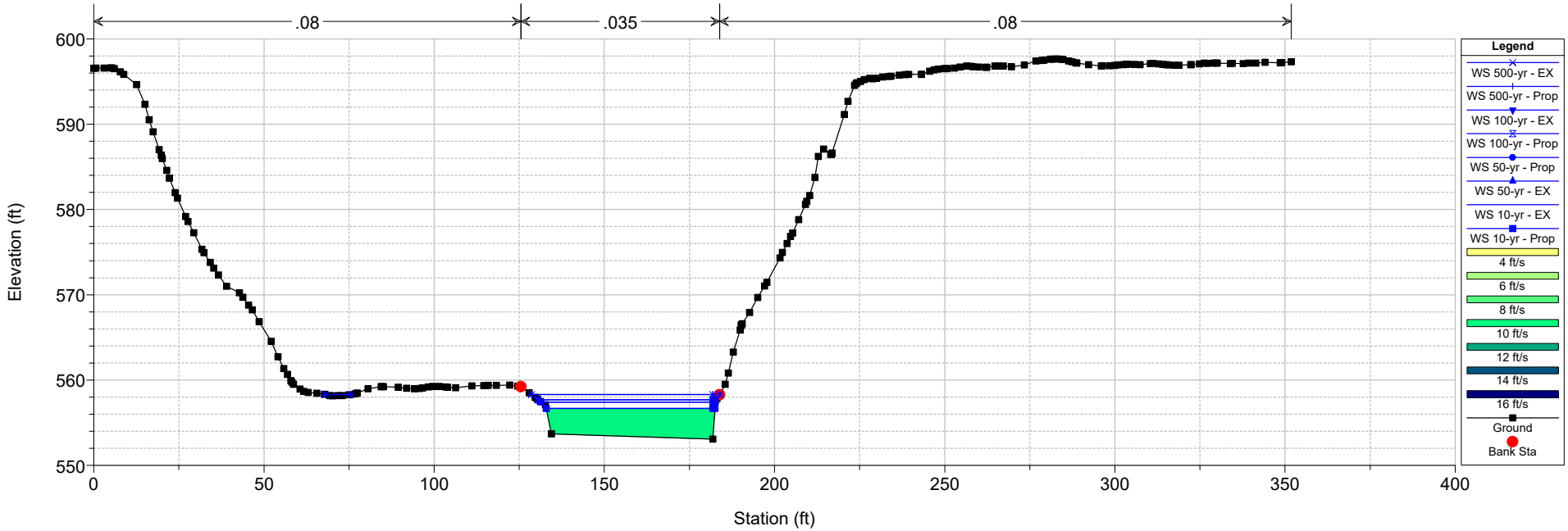
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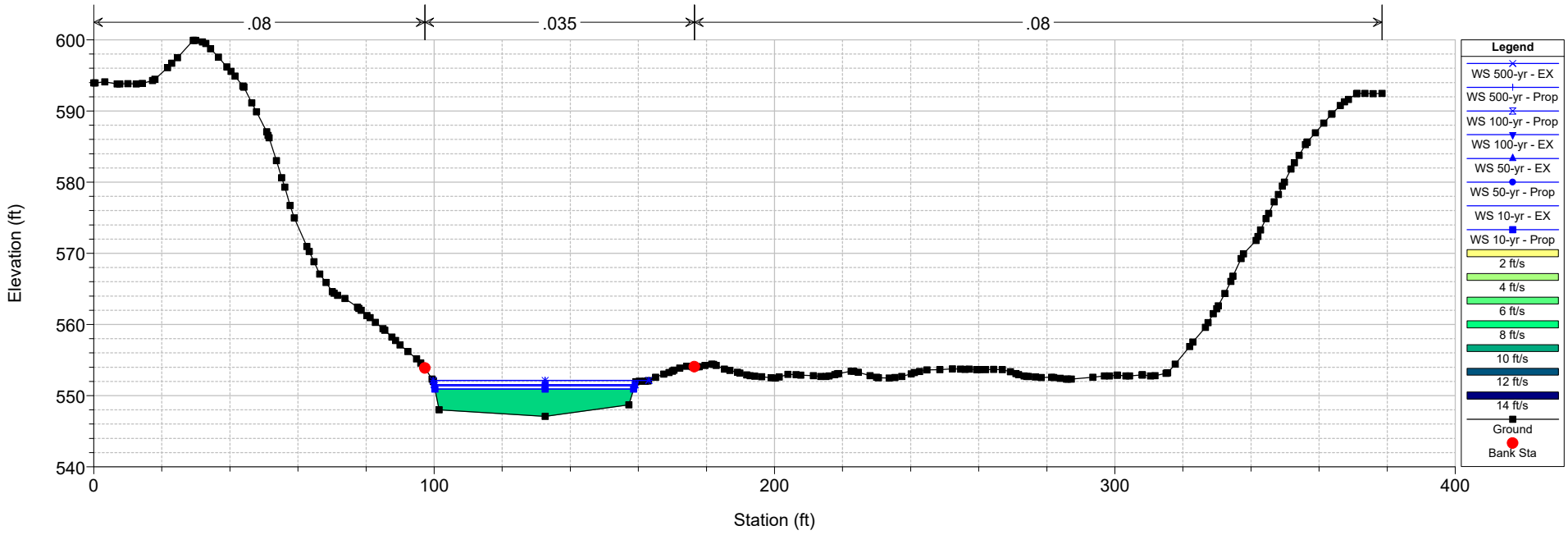
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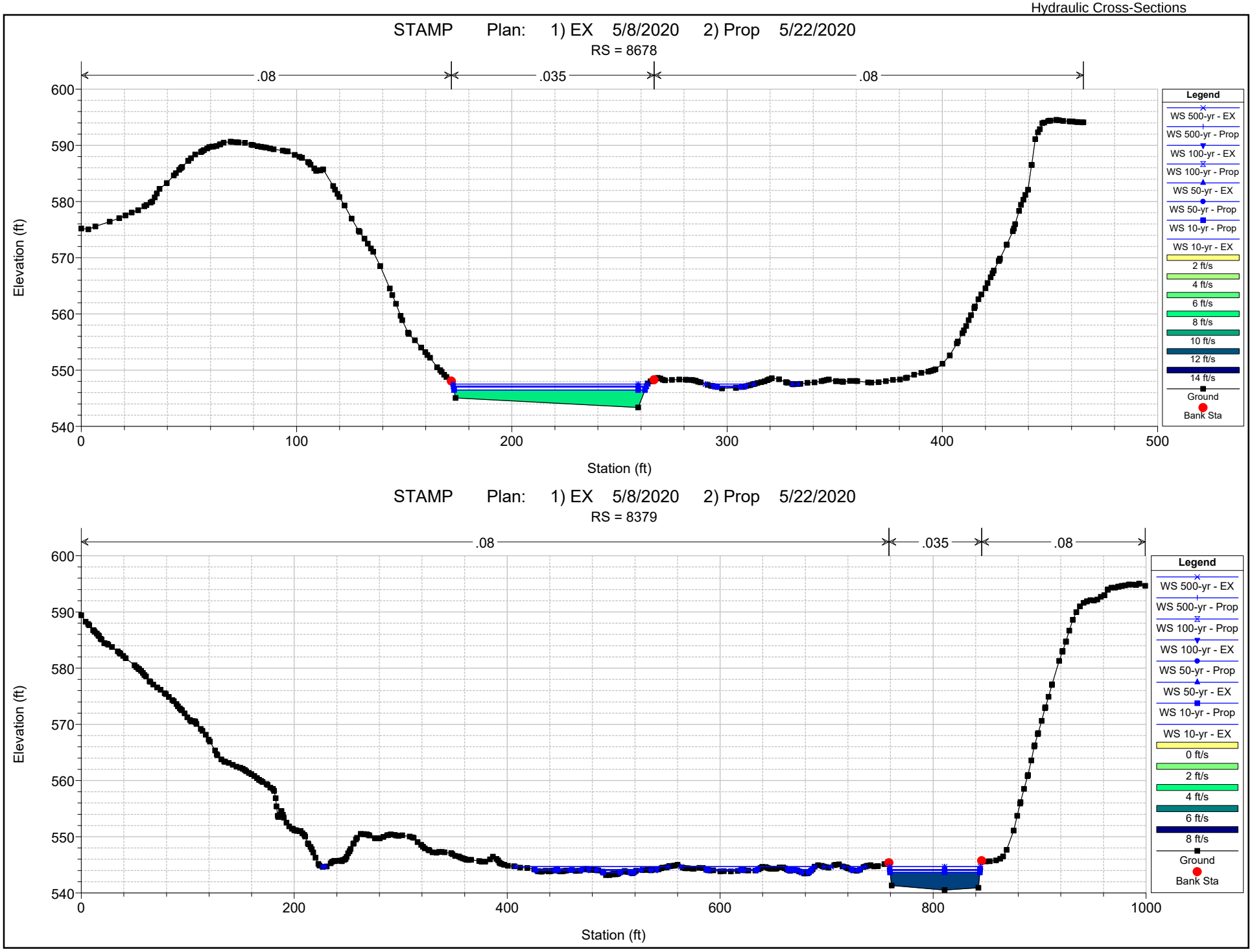


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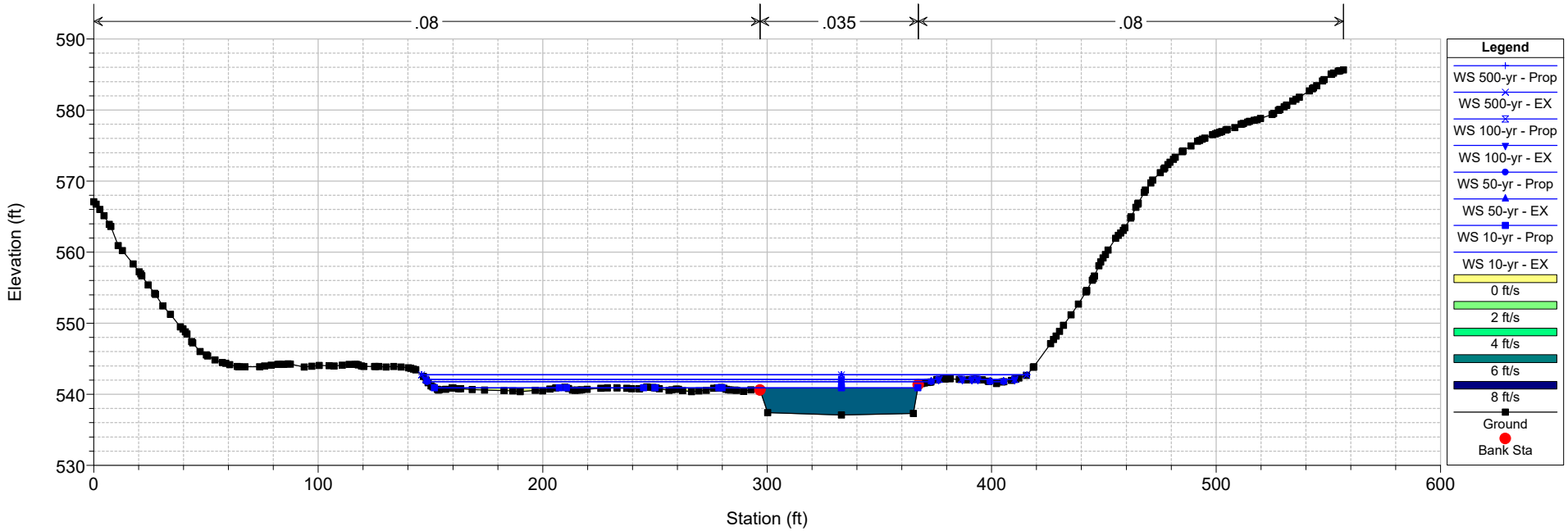
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.035
.08
Elevation (ft)
Station (ft)
Legend
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WS 500-yr - Prop
WS 100-yr - EX
WS 100-yr - Prop
WS 50-yr - EX
WS 50-yr - Prop
WS 10-yr - Prop
WS 10-yr - EX
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
Ground
Bank Sta
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.08
.035
.08
Elevation (ft)
Station (ft)
Legend
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WS 500-yr - Prop
WS 100-yr - Prop
WS 100-yr - EX
WS 50-yr - Prop
WS 50-yr - EX
WS 10-yr - Prop
WS 10-yr - EX
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
Ground
Bank Sta

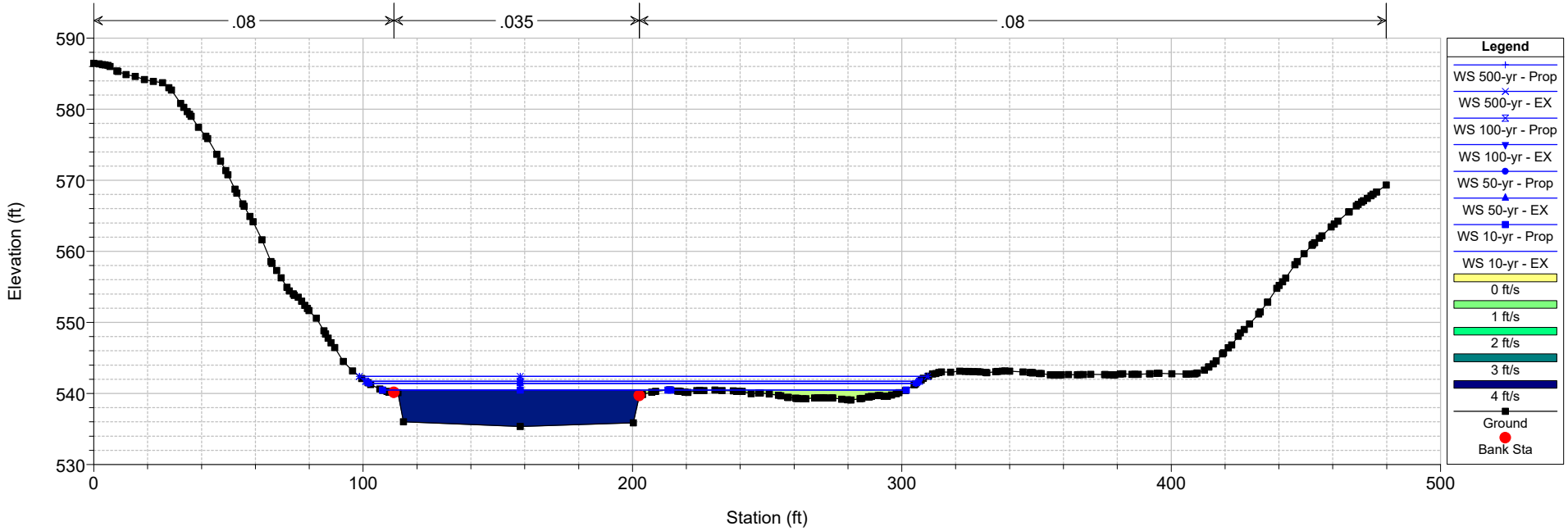
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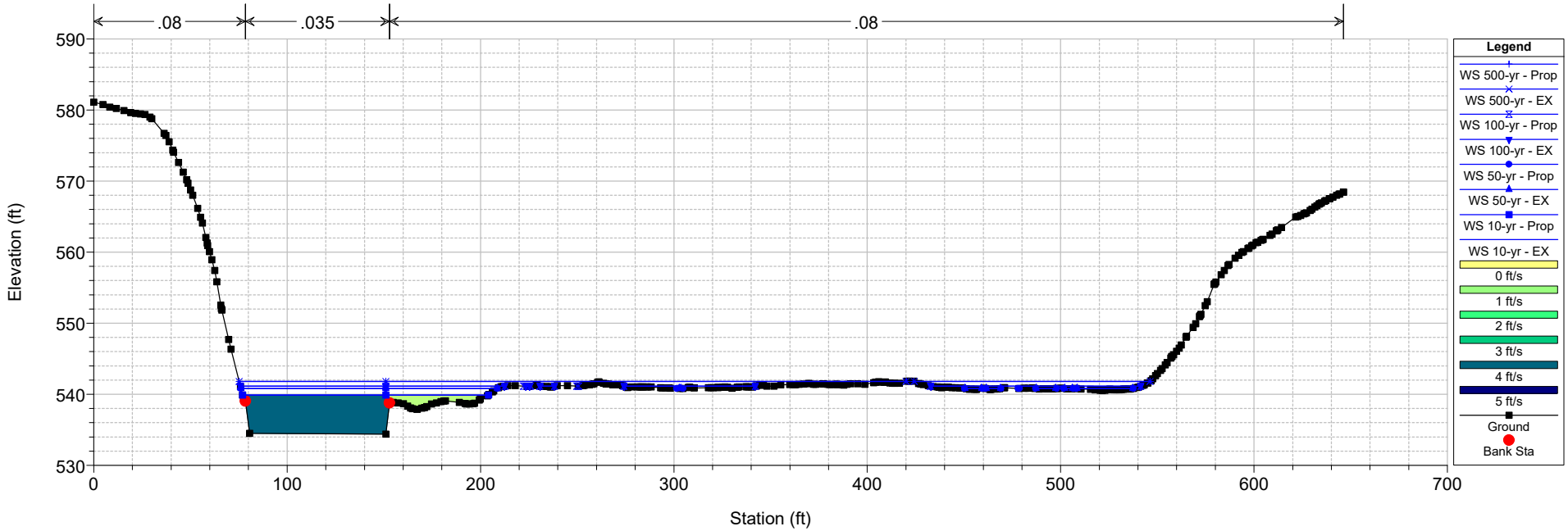


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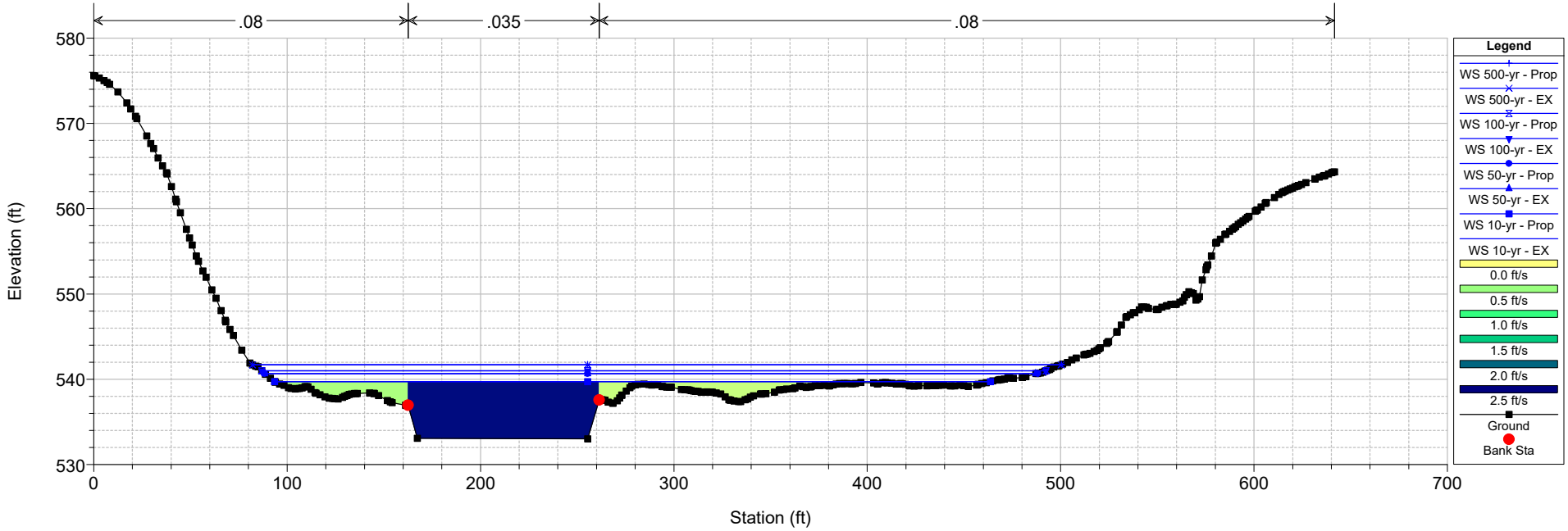
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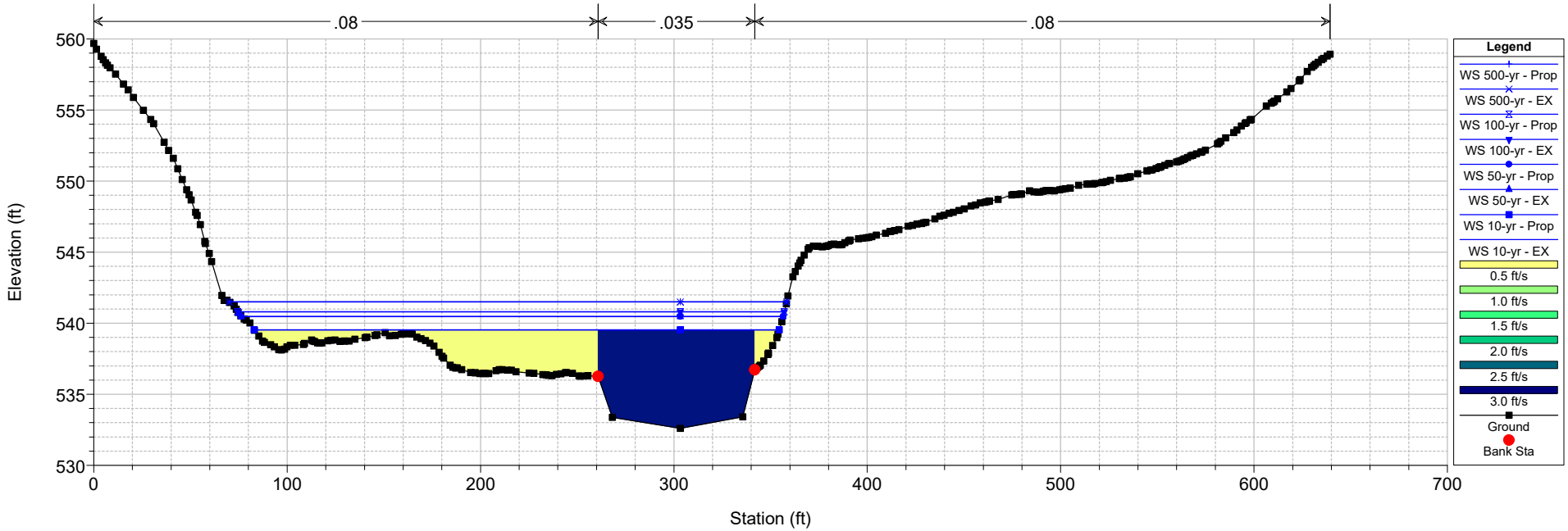


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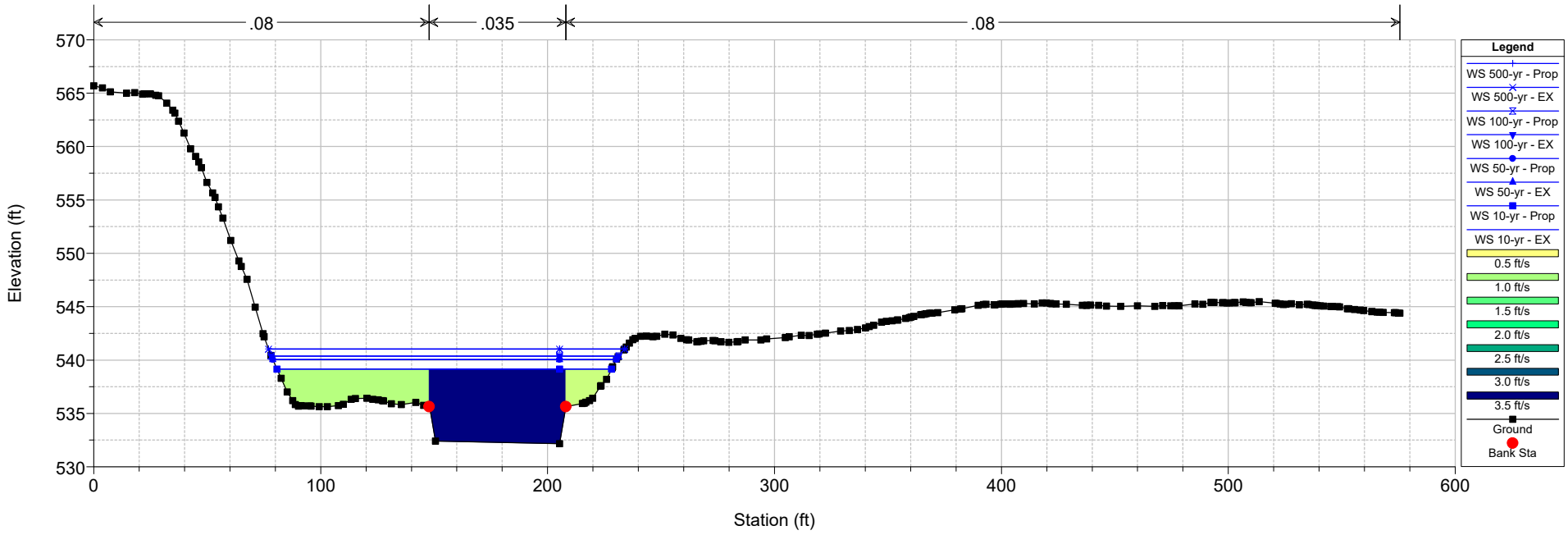
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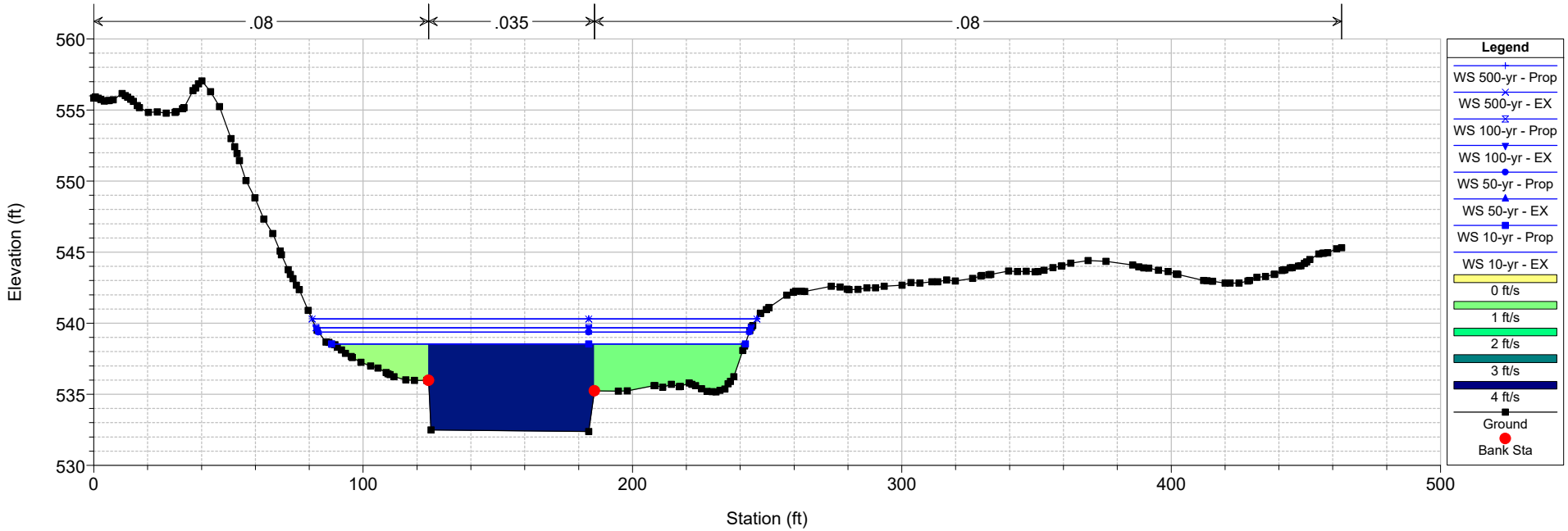


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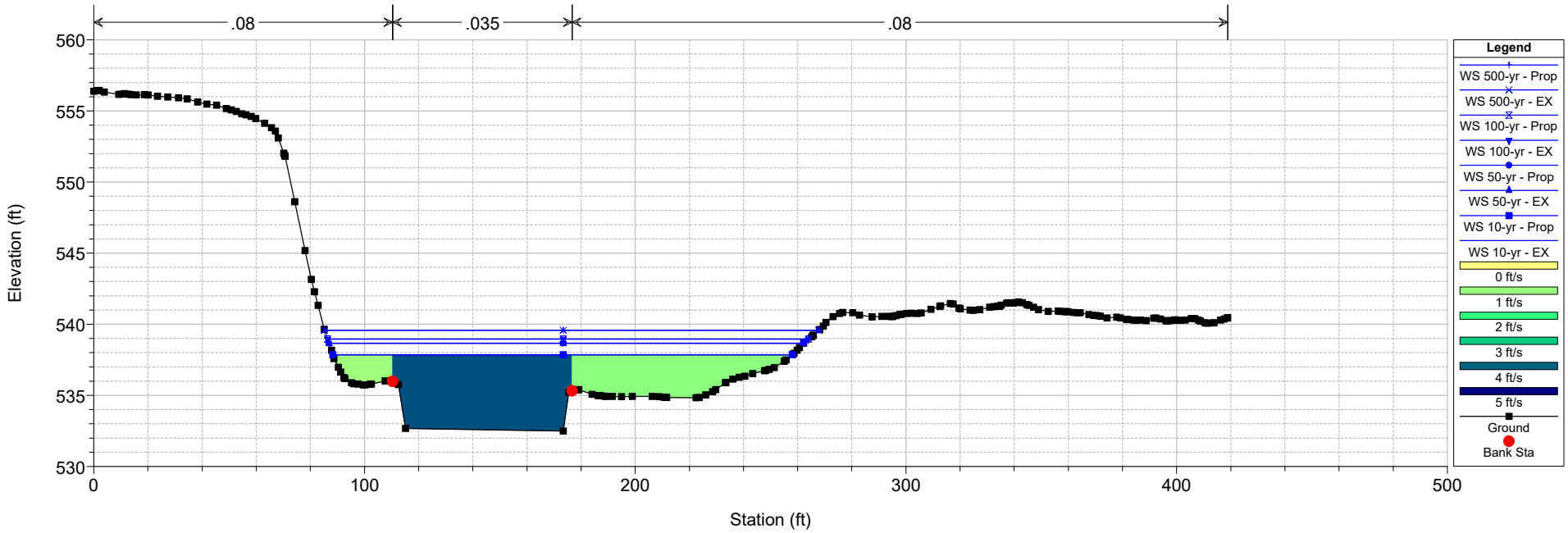
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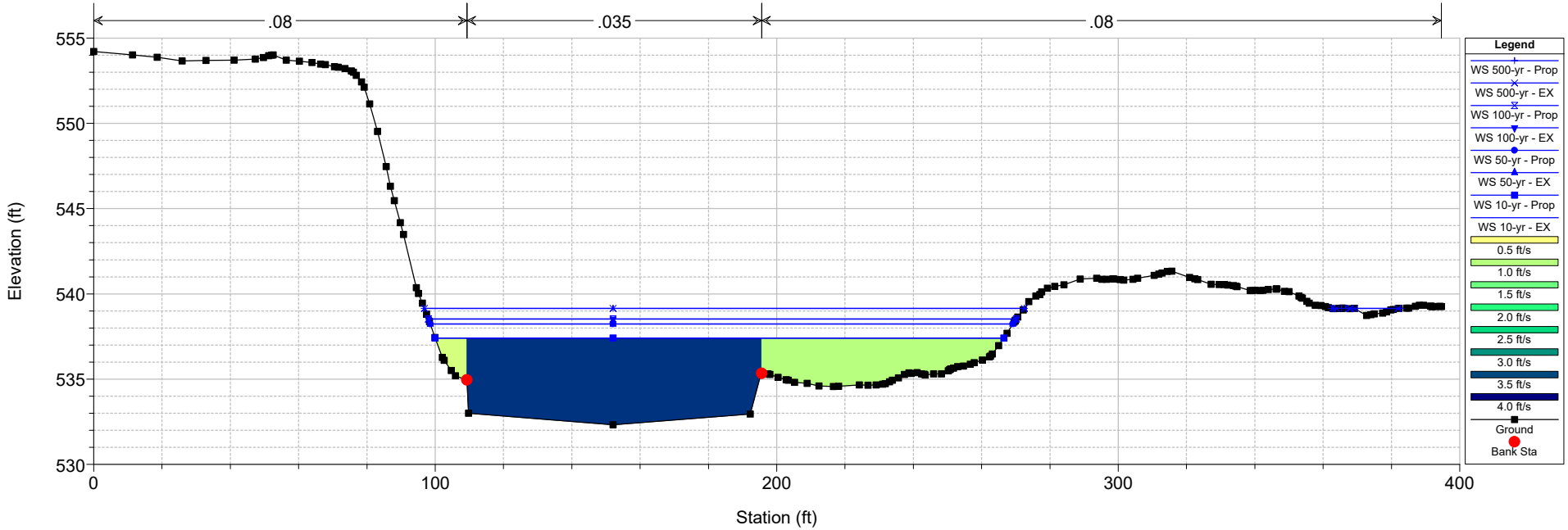


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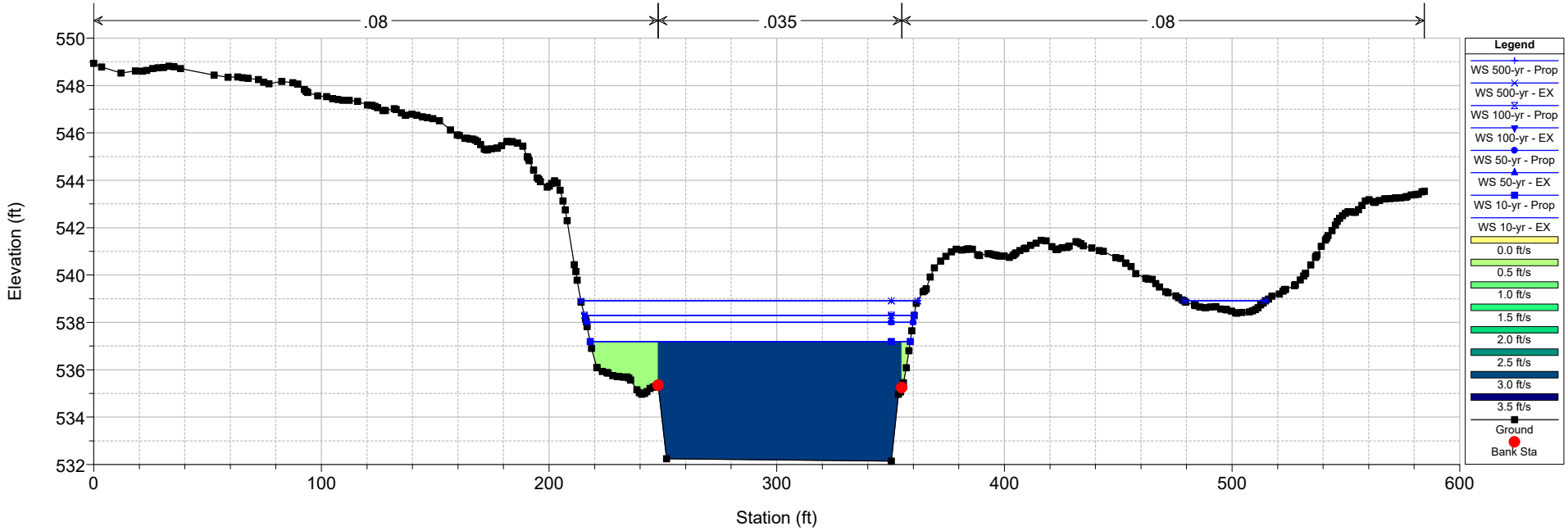
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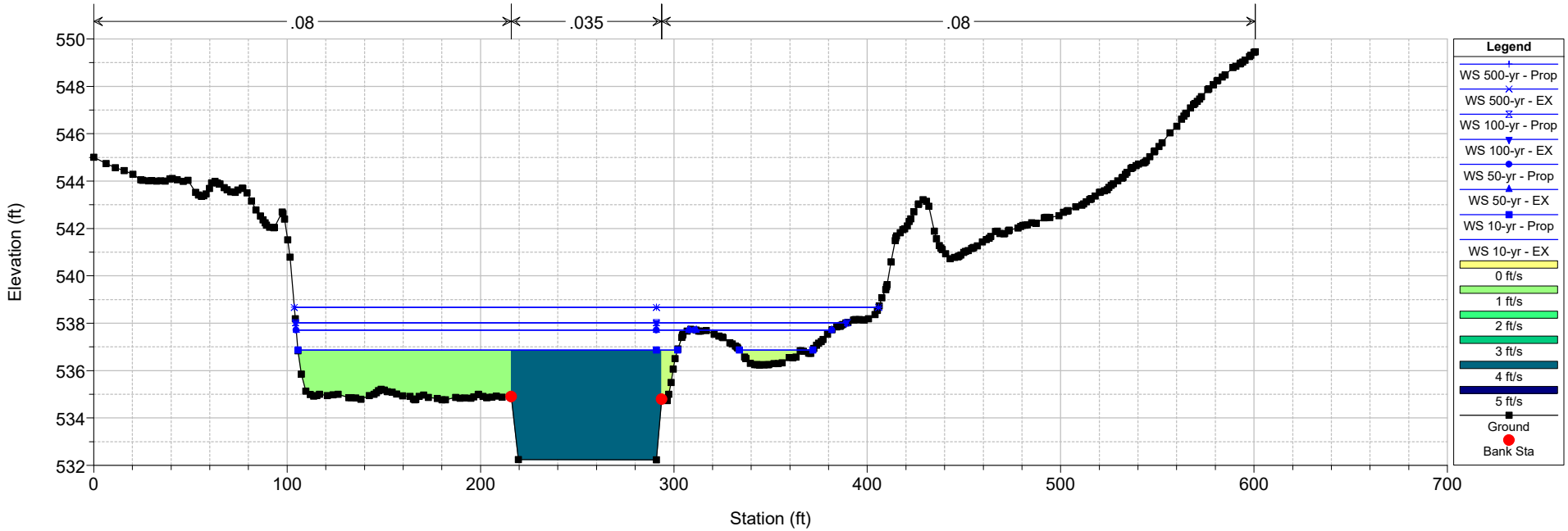


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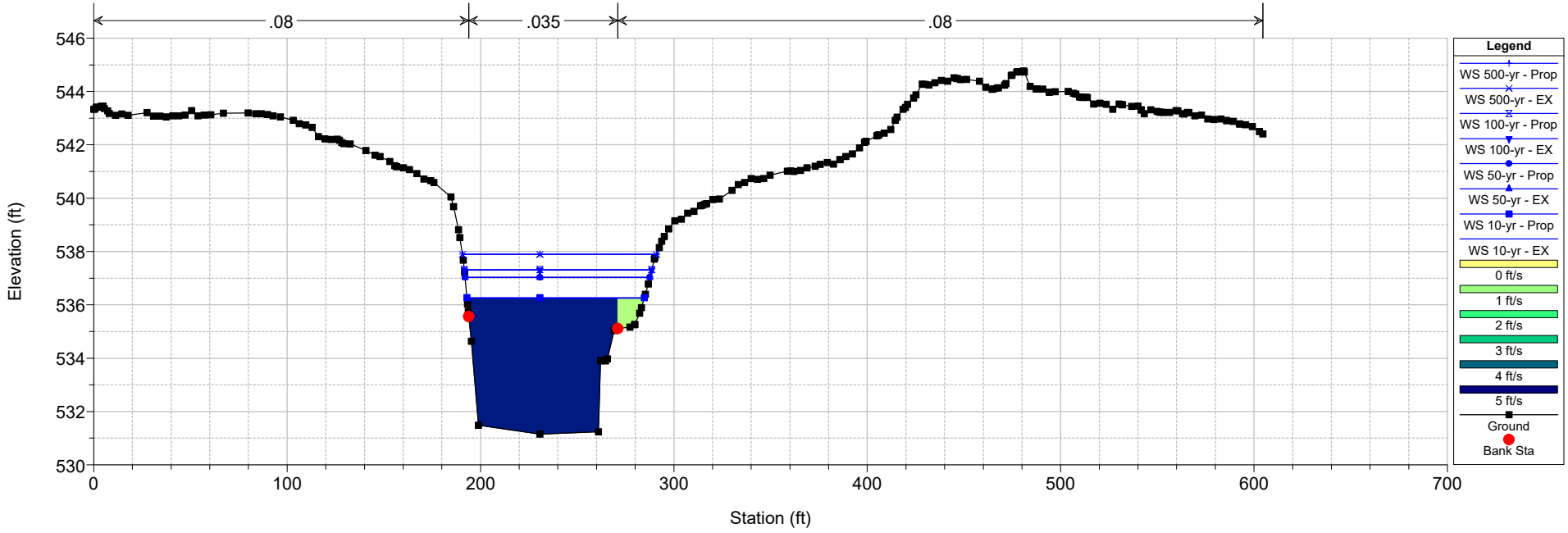
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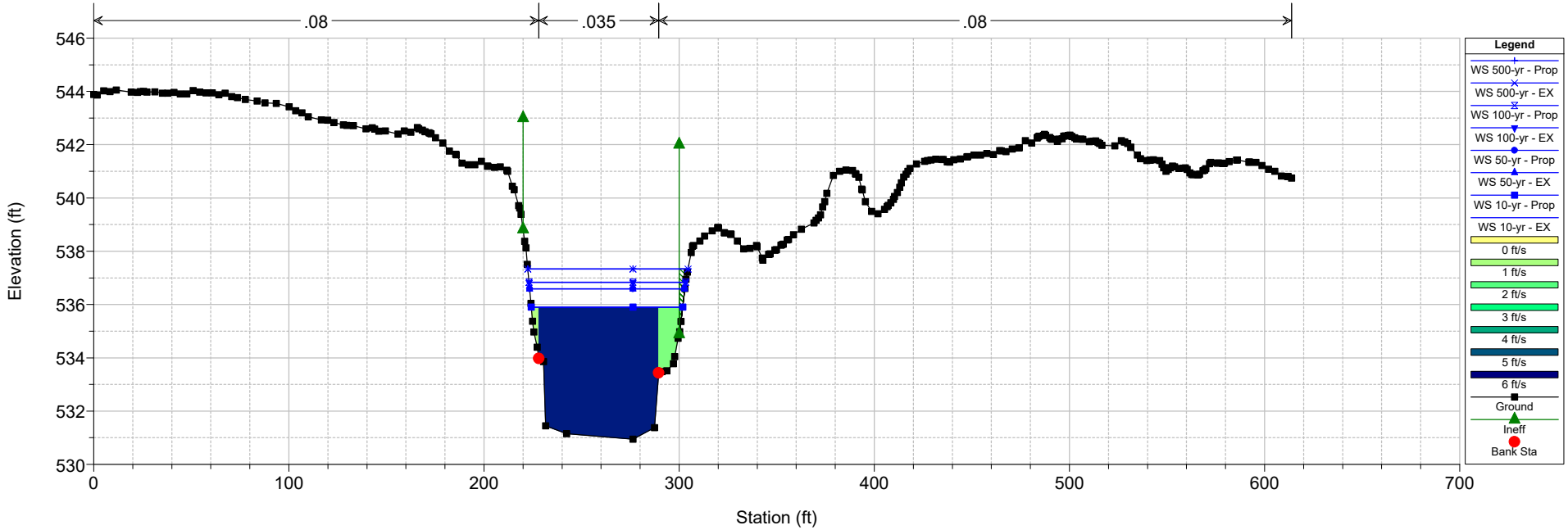
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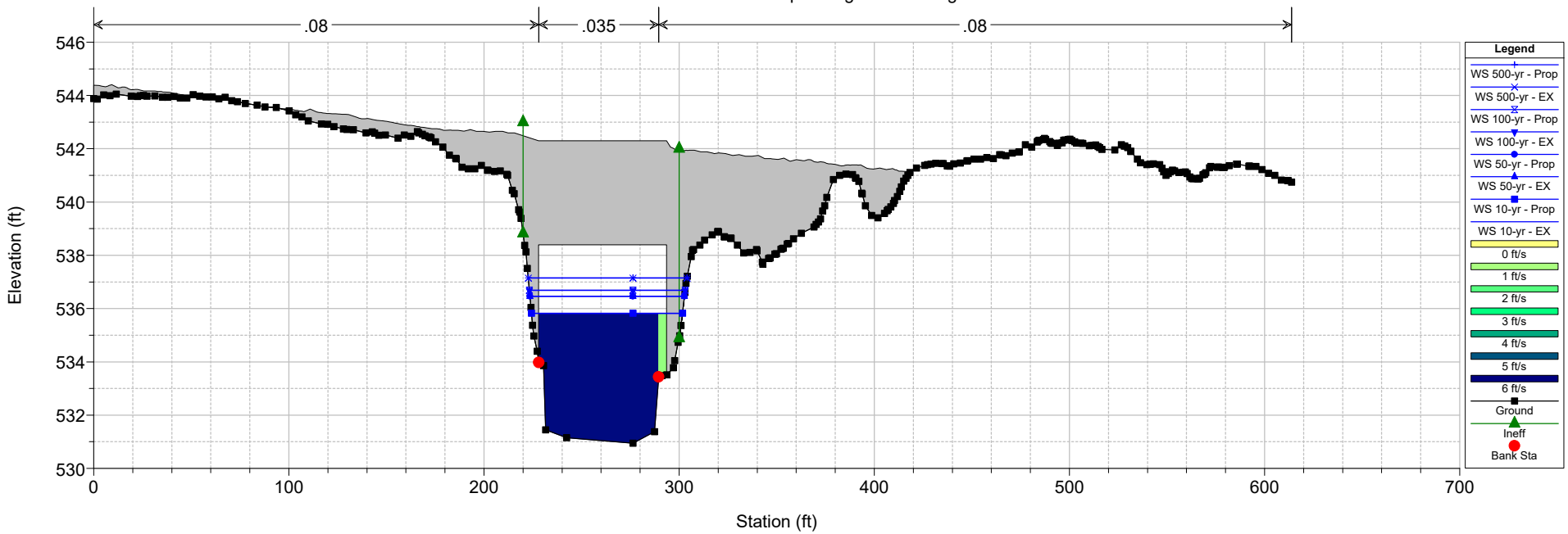
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STAMP Plan: 1) EX 5/8/2020 2) Prop 5/22/2020
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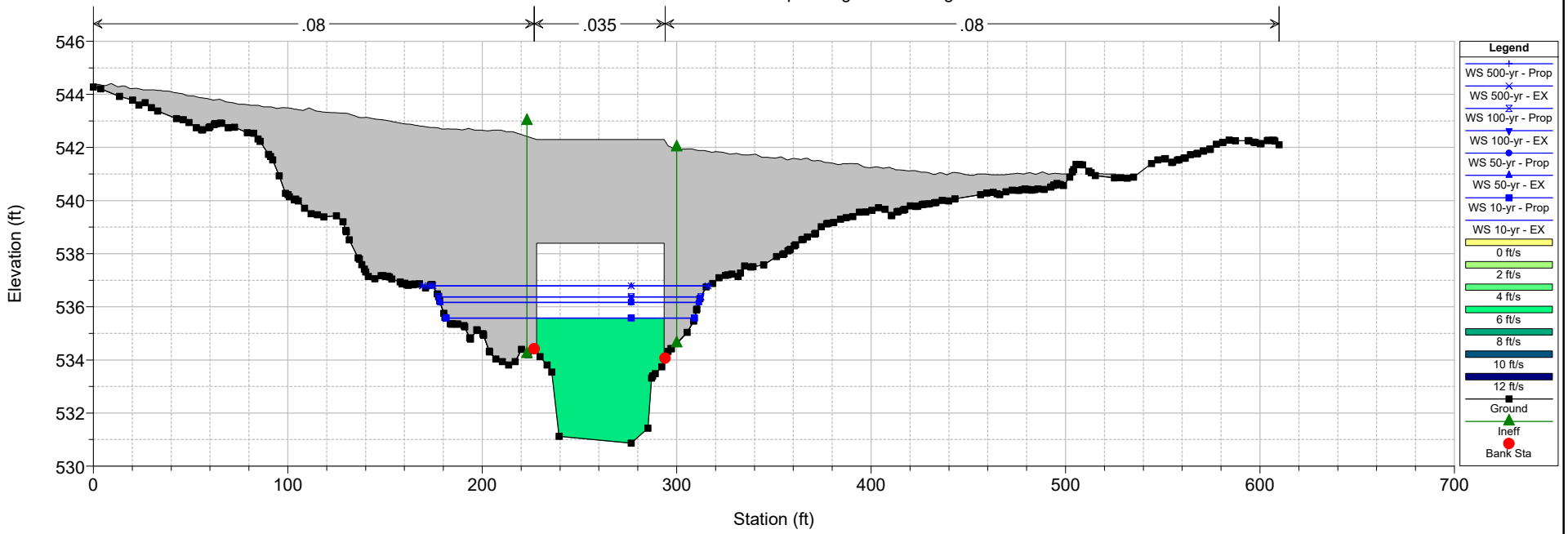


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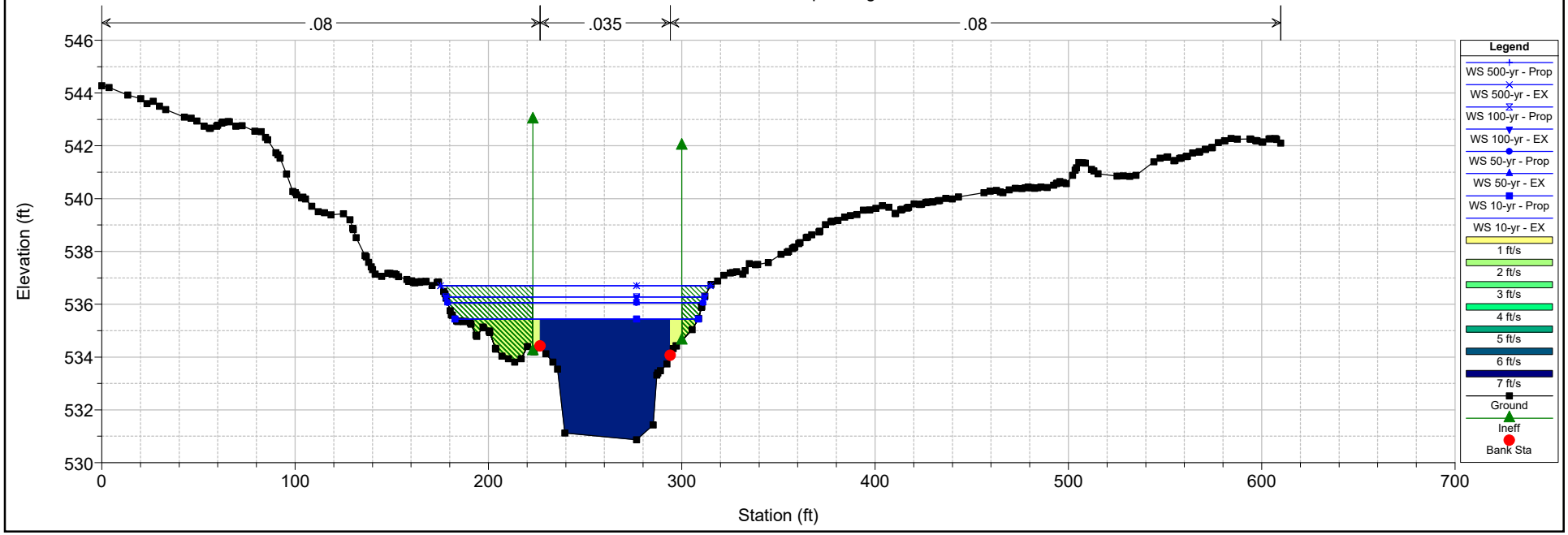
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RS = 2316 BR Maple Ridge Road Bridge

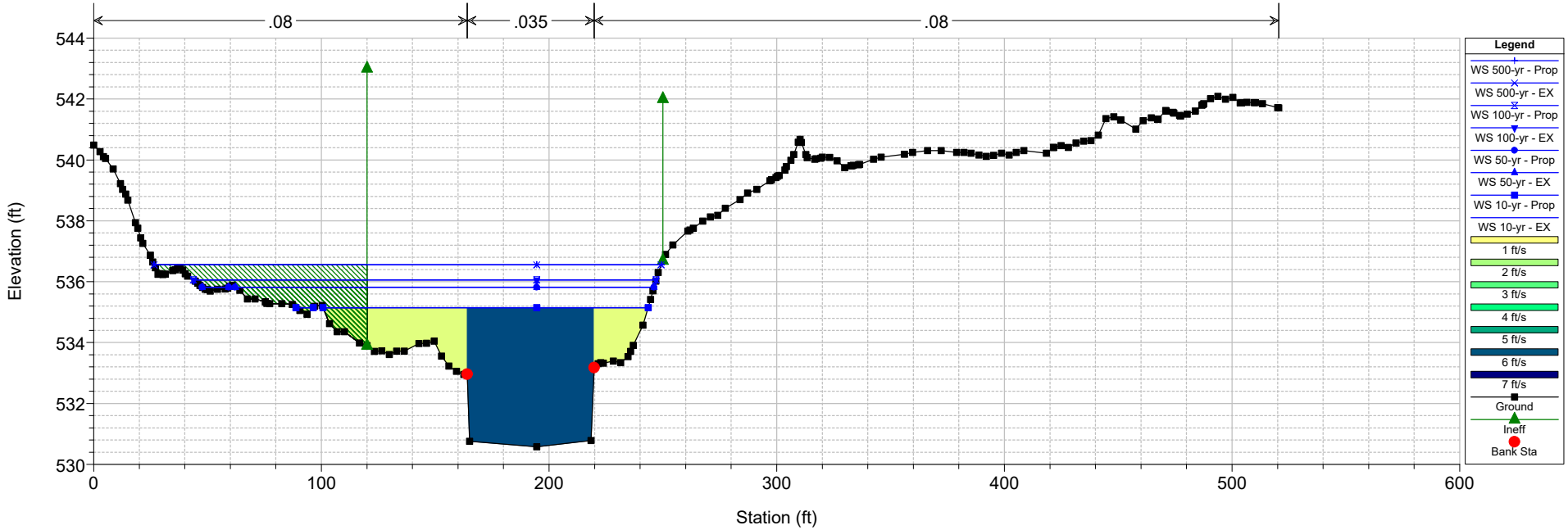


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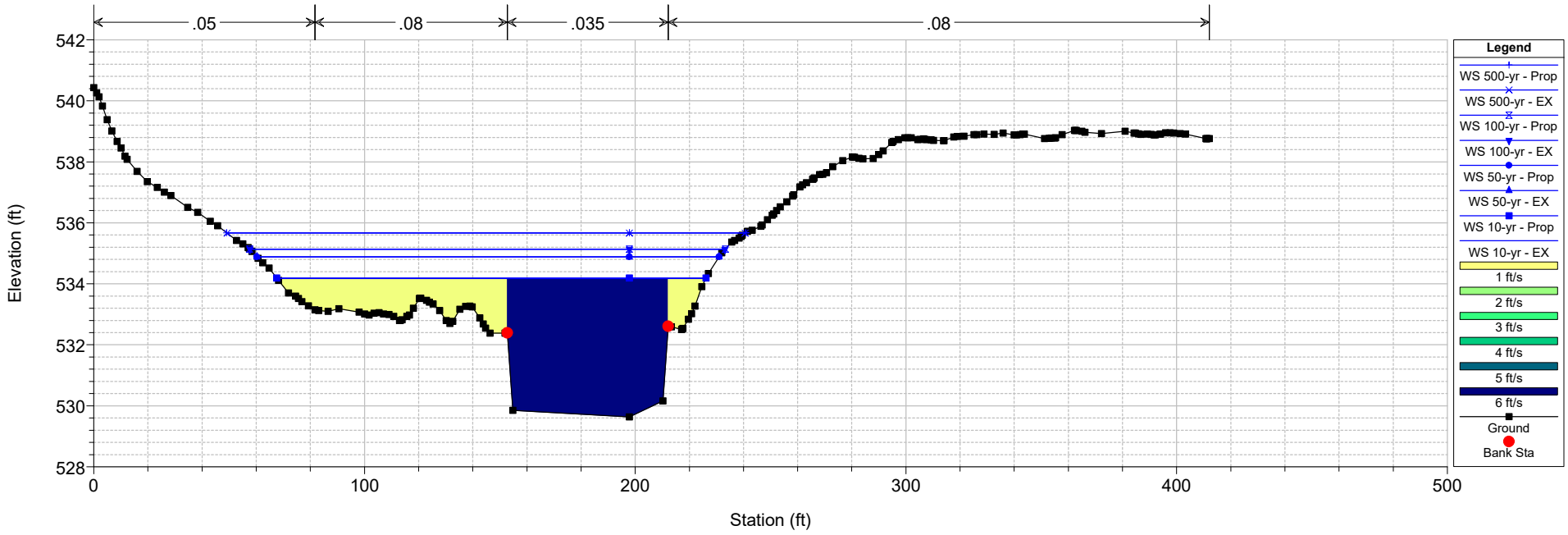
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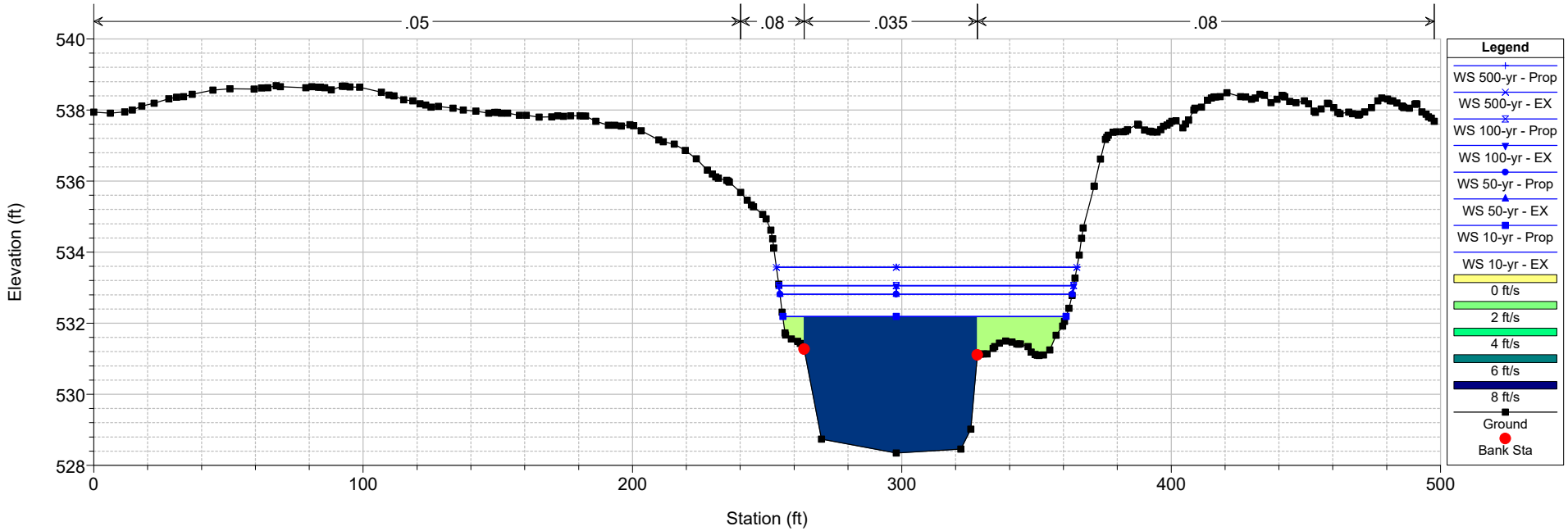


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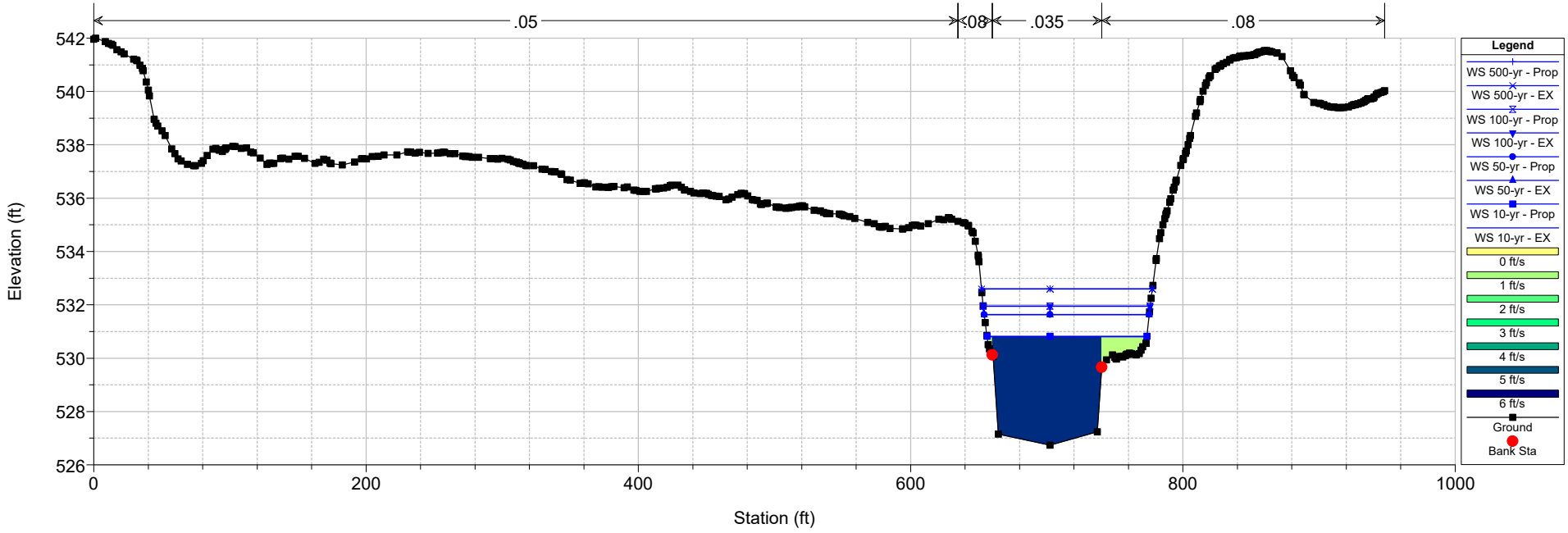
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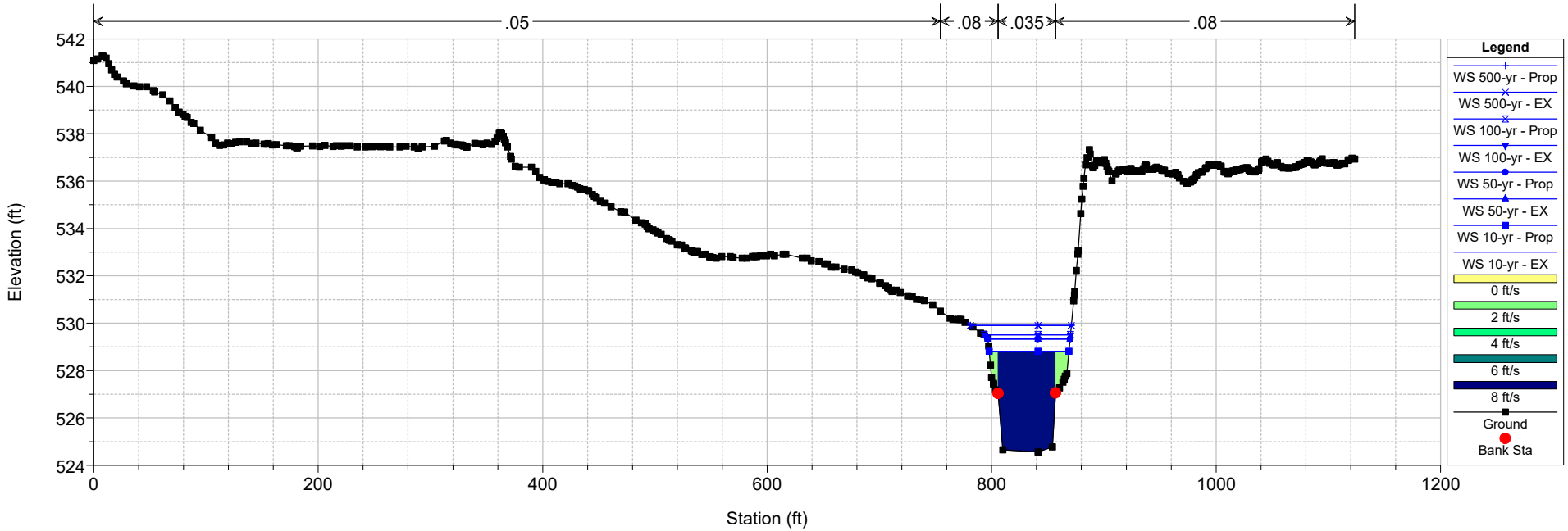
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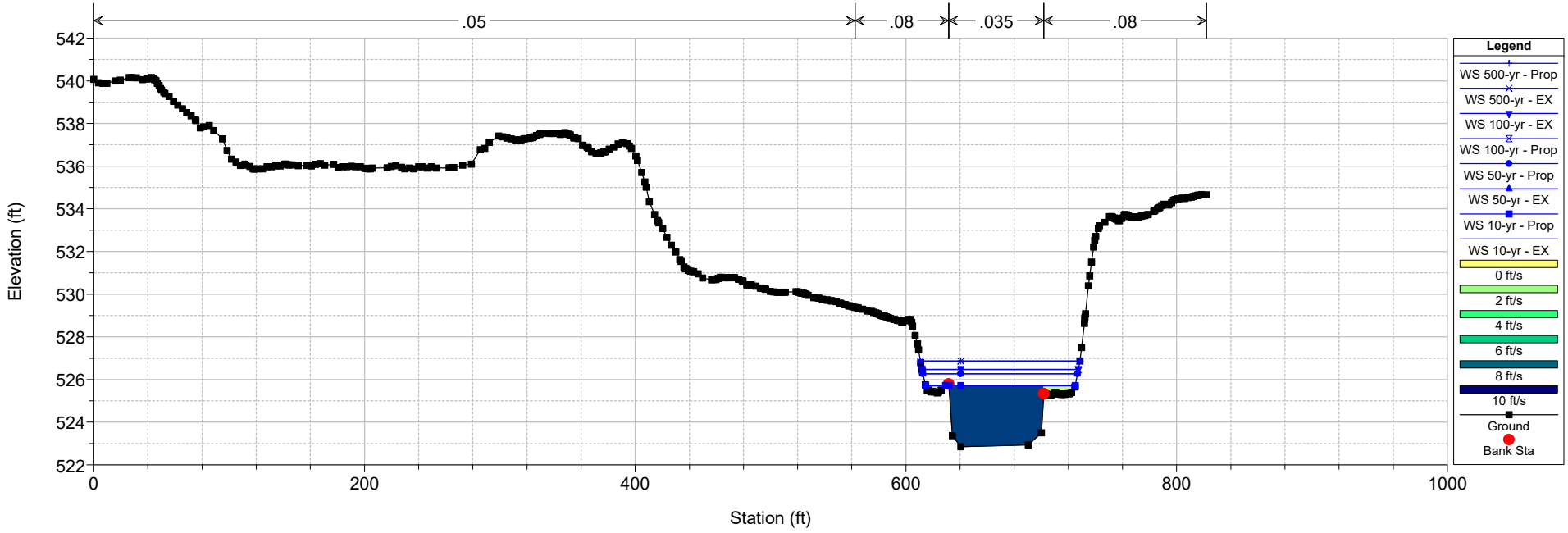
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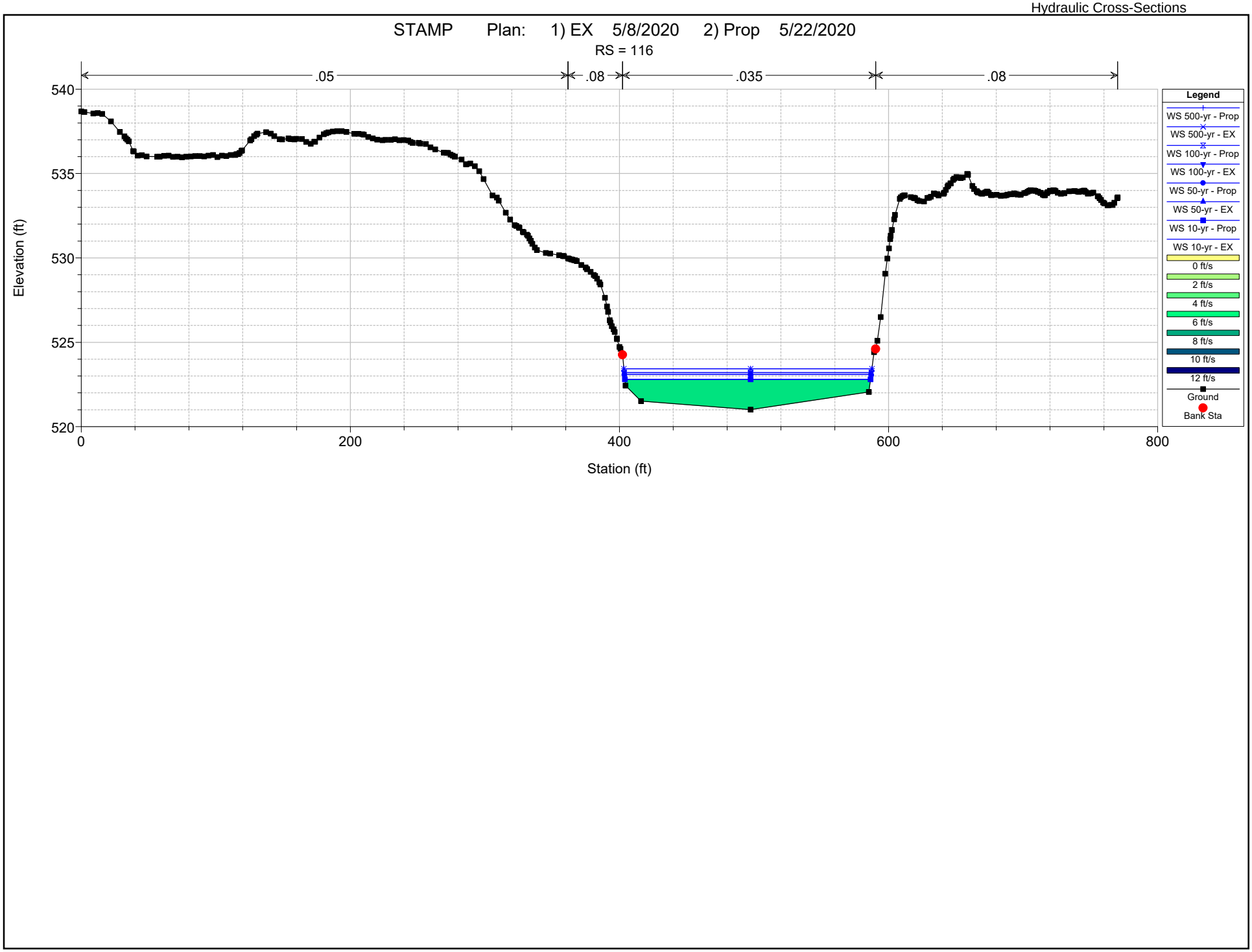
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RS = 276




STAMP Plan: 1) EX 5/8/2020 2) Prop 5/22/2020
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.05
.08
.035
.08
Elevation (ft)
540
535
530
525
520
0
200
400
600
800
Station (ft)
Legend
WS 500-yr - Prop
WS 500-yr - EX
WS 100-yr - Prop
WS 100-yr - EX
WS 50-yr - Prop
WS 50-yr - EX
WS 10-yr - Prop
WS 10-yr - EX
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta

STAMP 6 MDG Water

Basis of Design Report

For The

Genesee County Economic Development Center

June 2020



ARCHITECTURE
ENGINEERING
PLANNING
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Figure 1 Location Map
Figure 2 Proposed Water Transmission Main Route

I. General

A. Background

The Genesee County Industrial Development Agency d/b/a/ the Genesee County Economic Development Center (GCEDC) and its affiliate, the Genesee Gateway Local Development Corporation (GGLDC), have been working for the last several years on the development of the Western New York Science & Technology Advanced Manufacturing Park (STAMP). The Site is planned as an advanced manufacturing campus on approximately 1,262 acres of land in the Town of Alabama, New York located along the west side of New York State Highway 77/63 (north of Judge Road) approximately five miles north of the I-90/New York State Thruway (STAMP Site).

At full build out, STAMP will be a high technology campus with the potential to accommodate over 6 million square feet of advanced technology manufacturing and related uses and to create up to 10,000 jobs. The GCEDC, as lead agency pursuant to the State Environmental Quality Review Act (SEQR), prepared a Generic Environmental Impact Statement (GEIS) and a Smart Growth Impact Statement ("SGIS") that analyzed the potential impacts of STAMP pursuant to the requirements of the SEQR and the State Smart Growth Public Information Policy Act.

In January 2012, the Final GEIS for STAMP was accepted as complete. The FGEIS identified alternatives for water supply for STAMP and assumed a maximum demand of 3 million gallons per day (MGD) of water. Several phases and projects were considered, including a connection to the Town of Pembroke water system, a connection to the Village and Town of Oakfield water system, and onsite storage tanks.

In August of 2013, a Conceptual Water and Wastewater Alternatives Analysis and Recommendations Report identified potential water supply alternatives for the STAMP project based on a demand of 12.0 MGD. Several alternatives including the Niagara County Water District (NCWD), the City of Lockport, the Erie County Water Authority (ECWA) and Genesee County sources were considered to supply the STAMP project with an adequate water supply. Based on this report, the recommended water supply alternative was a combination of NCWD and Genesee County sources. Approximately 8.0 MGD would be available from NCWD while the remaining 4 MGD would be available from Genesee County.

Over a period of several years, discussions and meetings with the NCWD resulted in an agreement between the GCEDC and the NCWD to reimburse the NCWD for the cost of preparing a facility and infrastructure impact study. The study reviewed several alternatives and required upgrades to supply the STAMP site with 1, 2.4, 4, 8, and 13 MGD. In April of 2018, this study was finalized and detailed the costs and associated infrastructure improvements required to provide STAMP with up to 13 MGD.

In conjunction with developing alternatives for the NCWD water supply, several alternatives were also considered in Genesee County. A Water Supply Agreement was

drafted, approved and executed between Genesee County and the GCEDC, which outlined the process of providing STAMP with up to 200,000 gallons per day (gpd) of water. Additionally, the STAMP Technical Team helped develop a strategy for providing the Town of Alabama with a town-wide water supply plan. Construction for Phase 1 of this project began in August of 2017 and was completed in September of 2018. Phase 2 of this project started construction in April of 2018 and was completed in October of 2019. This Town system, which is connected to the larger Genesee County water supply allows the County to provide STAMP with up to 200,000 gpd. As an additional supply option from Genesee County, construction for the Pembroke Line was started in June of 2020 and is expected to be completed by June of 2021. It is anticipated that construction of this line will supply approximately 700,000 gpd of additional water to the STAMP Site.

The concept of utilizing onsite recycling for the industrial process wastewater was explored in 2017 and 2018. Recycling would significantly decrease the overall potential total volume of water supply from 12 MGD to 6 MGD.

NCWD is currently under contract with the GCEDC for the design and permitting of a 24-inch 6 MGD transmission line from the Robinson Road Pump Station to the Niagara County / Genesee County Line. The Environmental Review for this work will be the completed by NCWD

The GCEDC is currently designing and permitting a 24-inch 6 MGD transmission main from the Niagara County / Genesee County Line to the STAMP site, along with onsite water storage tanks. The Environmental Review of this work will be completed by GCEDC.

B. Purpose

A transmission main will be constructed to provide an additional 6 MGD of water supply capacity to STAMP. Storage for the water will consist of new water tanks constructed on-site. With these additional water infrastructure improvements and the Genesee County water supply of 0.9 MGD, the total water capacity will be 6.9 MGD.

This report will outline the design of the new transmission main and its various appurtenances. All work was designed within the accepted criteria of the Recommended Standards for Water Works (commonly referred to as the "10 States Standards").

II. Proposed Project Information

A. Alignment

Based on the current anticipated improvements to the NCWD system, a 24-inch transmission main within Niagara County will begin south of the City of Lockport at the existing Robinson Road Pump Station. The proposed alignment extends east along NYS Rt. 93 and Bunkerhill Road until the intersection with Royalton Center Road. The water

main then extends north until the intersection with Ernest Road, then east until the intersection with Lewiston Road. The transmission main will continue along Lewiston Road until the Niagara County / Genesee County Line. At the County line, a meter vault will be installed to separate the ownership between NCWD and GCEDC. The transmission main route including Niagara County is shown in Figure 1.

The transmission main from the Genesee County Line to the STAMP site will be aligned on the southern side of Lewiston Road. The transmission main will maintain this alignment until approximately 500 feet east of Crosby Road, which corresponds with a future roadway entrance to the STAMP site. Inside the STAMP site, the main will be aligned along the western/northern sides of the proposed roadways until the "Utility Parcel". The transmission main route from the Niagara County / Genesee County Line to STAMP is shown on Figure 2.

The typical offset from the edge of pavement is approximately 8 to 10 feet for open cut installations to prevent undermining of the roadway. At this offset the water line will run along the southern Right of Way line of Lewiston Road for a majority of the alignment length with portions of the water line trench outside of the public space. In areas where horizontal directional drilling is required, or where existing site features (headwalls, culverts, etc.) must be avoided, the offset may be increased.

Approximately 50% of the proposed alignment length will be located adjacent to or within the Tonawanda Wildlife Management Area (TWMA) managed by the New York State Department of Environmental Conservation (NYSDEC). The remaining 50% will be within the Town of Alabama limits and the STAMP site. In order to construct the transmission main, easements will be required from both the NYSDEC and from private property owners.

B. Preliminary Hydraulics

A conceptual level hydraulic analysis is currently underway. Per the 2018 Wendel report, the pressure available at the Niagara County / Genesee County Line with varies between 35 to 50 psi. The existing topography between the County line to STAMP is relatively flat, with an elevation difference of approximately 80 feet from the lowest point in the system to the highest. Based on the available pressure, topography and length of the pipeline, it is anticipated that pump stations will be required to convey the water from the transmission main to the storage facility for demands larger than 2 MGD. The pump stations may be located in Niagara County, Genesee County or on the STAMP site and will be located along the transmission main alignment. The pump station locations will be selected during the design process and will avoid wetlands and other sensitive resources areas.

C. Design Capacity

The transmission main booster pumps and storage tanks will be sized to provide a supply capacity of 6 MGD. STAMP water demands are expected to be a combination of a

domestic demand (i.e. water use directly linked to building personnel) and a "Process Water" (PW) demand (i.e. water used for industrial activities such as non-contact cooling).

As agreed by all stakeholders, including an agreement between Genesee County and Monroe County Water Authority (MCWA), this NCWD water supply will only be used on the STAMP site. System water will be conveyed from the NCWD system directly to a water storage facility on the STAMP site. Distribution of on-site water will occur via a separate pipe network connection to the tank(s).

D. Field Work

Field activities consisting of wetland delineations and archeological investigations are currently underway.

The wetland delineations will occur along the south side of Lewiston Road with limits extending approximately 50 feet from the edge of the roadway pavement.

A Section 233 permit for the archeological investigations was received on May 11, 2020 for work within the Tonawanda Wildlife Management Area. The field work for the investigation will commence following coordination with the New York State Historic Preservation Office (SHPO) which will set the limits of the work.

III. Proposed Transmission Main System Design Components

A. On-Site Storage

The type of onsite water storage tanks is currently being evaluated and may consist of either an elevated water towers, ground level tanks, or a combination of the two. The possible tank location(s) are also currently being evaluated. Due to a Town zoning ordinance, the maximum height of structures is limited to 110 feet in Technology District 1, without an additional variance approval. The storage facilities will be sized based on a ratio of 1 gallon of storage volume for every 1 gallon per day of usage/demand.

B. Pipe Selection

The transmission main design will consider ground elevation, surface features, natural resources and allowable pressure within the pipe.

The pipe material for the NCWD portion of the water main will consist predominately of 24-inch precast concrete cylinder pipe (or PCCP). At the Niagara County / Genesee County line, the pipe will transition from PCCP to 24-inch Class 52 DIP pipe. DIP pipe was selected to best accommodate the wide range of flow conditions and associated pressures and reduce pipe friction losses at the future higher flow. DIP also provides additional flexibility during construction if unknown field conditions are encountered.

For sections of alignment that encounter unfavorable soil conditions (moist peat and organics) or are crossing streams, wetland areas, or roads the transmission main will be installed by horizontal directional drilling (HDD) methods using fused high-density polyethylene pipe (HDPE). 24-inch DR-11 HDPE pipe will be used for the carrier pipe. If any crossings also require a casing pipe, 36-inch DR-11 HDPE pipe will be utilized for the casing pipe.

C. Fire Hydrants, Blow-off Hydrants & Air Release Valves

A total of approximately 23 fire hydrants will be installed at 1000-foot intervals along the transmission main route between the STAMP Site and the Niagara/Genesee County line. In addition to providing fire protection along the route, the hydrants can be used during maintenance activities to flush out the main and serve as a blow-off in the system if located near a low-point in the line. Hydrants designated as a "blow-off hydrant" will consist of a tee rotated downward. A minimum flushing velocity of 3 fps is desired at all blow-off hydrant locations.

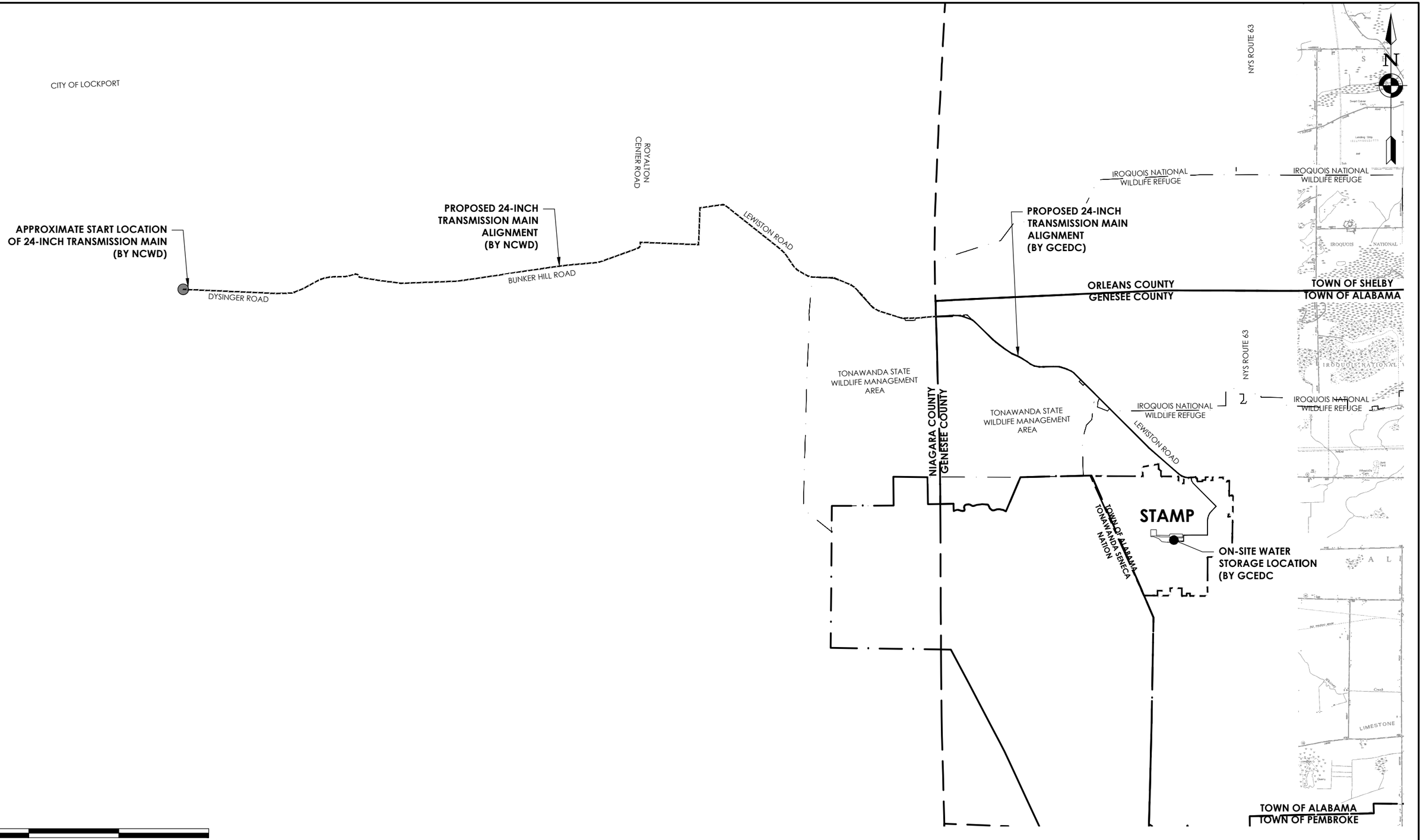
Air release valves will be installed at key high points located along the alignment. Each valve location will consist of the air release valve being placed in a precast manhole with manhole steps, watertight frame and cover and vent piping.

D. Main Line Valves

The transmission main will require main line gate valves along the route from the STAMP site to the Niagara/Genesee County line. The gate valves serve provide a means to isolate sections of the transmission main for testing and maintenance purposes. Valves are located at approximately 2,000-foot spacing intervals.

IV. Conclusion

The STAMP 6 MGD Water project is an integral and critical part of the necessary infrastructure for the STAMP Site. Coordination of the project design with the environmental field work will minimize potential environmental impacts through selection of the alignment route, the use of horizontal directional drilling to avoid sensitive area and the placement of water line appurtenances outside of environmentally critical locations. The GCEDC should proceed with the STAMP Site project as described in this report.



205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
CPLteam.com
ARCHITECTURE ▪ ENGINEERING ▪ PLANNING

FIGURE 1

OVERALL WATER TRANSMISSION MAIN SYSTEM MAP

DATE:	5/22/20
DRAWN:	RRT
CHECKED:	JF
SCALE:	AS NOTED
PROJ. #:	14822.00

WNY STAMP 6 MGD WATER

TOWN OF ALABAMA, NEW YORK STATE

Referenced Drawings: None
Drawing Name: J:\PROJECTS\GCEDC\STAMP 6 MGD\D Design\ACAD\Civil\Figures\Location Map May 2020.dwg
Date last accessed: 5/26/2020 9:18 AM
Date last plotted: 6/10/2020 3:07 PM
Plotted By: Richard Tousant

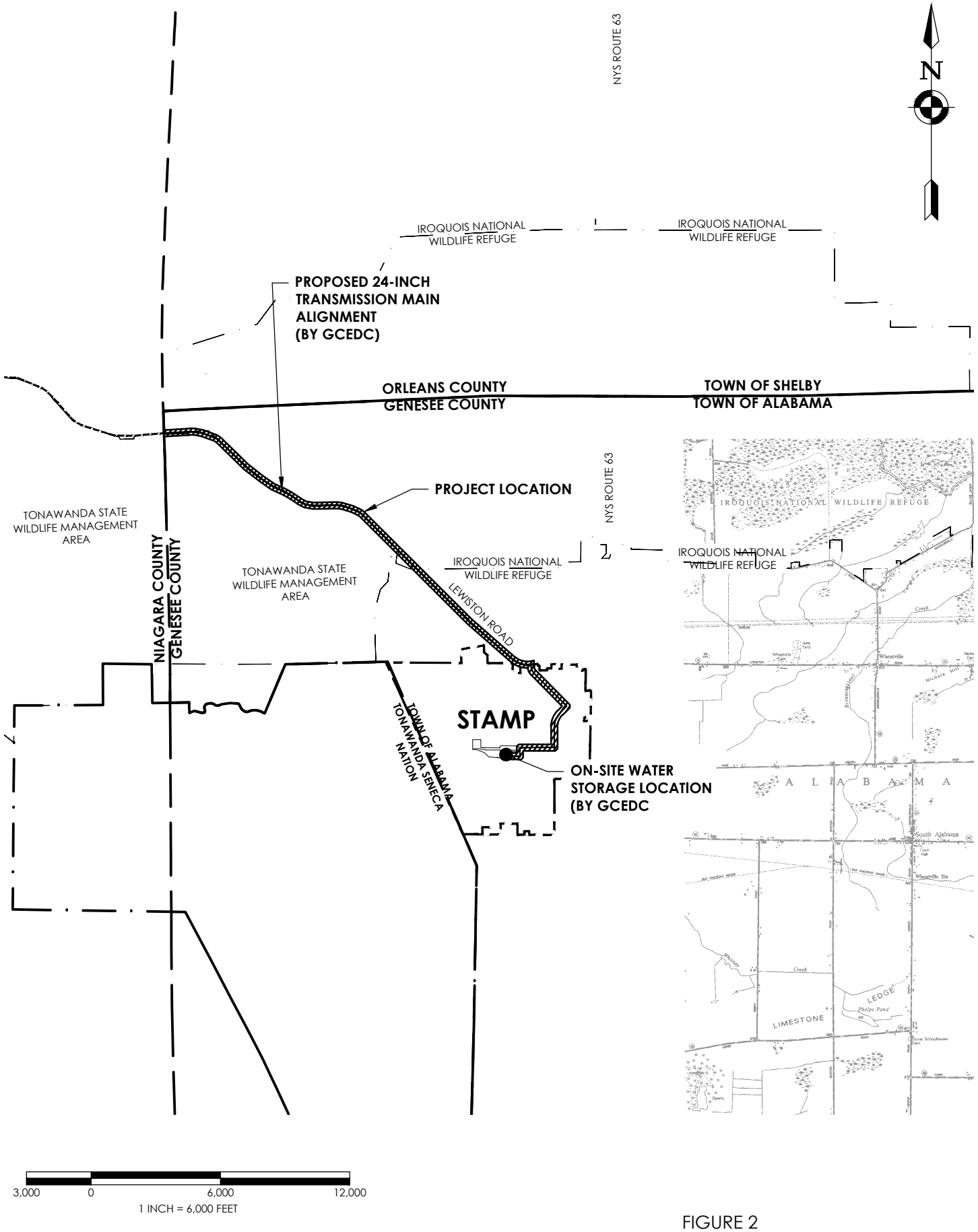


FIGURE 2

205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
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DATE:	5/22/20
DRAWN:	RRT
CHECKED:	JF
SCALE:	AS NOTED
PROJ. #:	14822.00

STAMP SITE WATER TRANSMISSION MAIN LOCATION MAP

WNY STAMP 6 MGD WATER

TOWN OF ALABAMA, NEW YORK STATE

Referenced Drawings: None
Drawing Name: J:\PROJECTS\GCEDC\STAMP 6 MGD\D Design\ACAD\Civil\Figures\Location Map May 2020.dwg
Date last accessed: 5/26/2020 9:18 AM
Date last plotted: 6/10/2020 3:08 PM
Plotted By: Richard Tousant

M e m o r a n d u m

To: Genesee County Economic Development Center
Date: June 26, 2020
From: Sheila S. Hess – Principal Ecologist/CEO
Subject: **STAMP Water Main/Force Main (Wastewater)/Station Wetland and Stream Impacts**

A delineation of wetlands and streams has been completed within project areas for the proposed STAMP Force Main, Water Main, and STAMP Station as described below. A delineation summary for the STAMP Water Main and Force Main is provided in Attachment A. A delineation summary for STAMP Station is provided in Attachment B.

Force Main: Construction of the Force Main which involves the installation of approximately 44,750 linear feet of sanitary force main, metering vaults, and maintenance manholes. The vast majority of installation of sewer related infrastructure will be along public roads via a combination of open cut method and directional drill methods. The Force Main will convey up to six (6) million gallons per day ("MGD") of treated wastewater from the STAMP site to a new discharge in Oak Orchard Creek.

Water Main: A new water main ("Water Main") of approximately 23,000 linear feet to be installed along the Lewiston Road right of way between the Genesee County line with Niagara County and the STAMP Site. The new water main will bring up to six (6) MGD of water from the Niagara County Water District ("NCWD") to STAMP.

STAMP Station: The development of an approximate 20-acre parcel located immediately north of STAMP. This landlocked parcel lies between the STAMP Site and a utility corridor which houses the Empire Pipeline and a 345 KV Power Line which will ultimately supply power to STAMP tenants. This parcel is located to the west of the intersection of Lewiston Road (NYS Route 77) and Crosby Road in the Town of Alabama and is bounded by the Empire Pipeline/345 KV Power Line utility corridor to the north, hedgerows to the east and south, and woods and brush to the west. It is anticipated that this parcel will be the site of an electrical substation.

An estimate of unavoidable temporary impacts to wetlands and streams for the Force Main and Water Main are presented in the table below. These impacts have been minimized to the maximum extent practicable. Temporary impacts to wetlands and streams for the Force Main total 0.25 acre and for the Water Main 0.38 acre. These impacts are due to open cut trench and/or staging areas for horizontal directional drilling (HDD) and will be returned to existing conditions when project construction is complete. All applicable permits will be secured prior to project construction and compensation for impacts will be completed if required (Attachment A).

There are no anticipated impacts to wetlands within the STAMP Station project area (Attachment B).

STAMP Water/Wastewater Wetland and Stream Impact Table			
Identifier	**Project Area**	**Installation Method**	**Temporary Impact (SF)**
W-1	STAMP Water Main	Open Cut	531
W-2 S-1 S-2 S-3	STAMP Water Main	Open Cut/HDD	14,700
W-3 S-4	STAMP Water Main	Open Cut/HDD	830
W-4 S-5	STAMP Water Main	Open Cut	290
W-5	STAMP Water Main	Open Cut	0
W-6 S-6	STAMP Wastewater	Open Cut	398
S-7	STAMP Wastewater	HDD	0
S-8a and 8b	STAMP Wastewater	HDD	0
S-16	STAMP Wastewater	HDD	0
S-14 S-15	STAMP Wastewater	HDD	0
W-7	STAMP Wastewater	HDD	0
S-13	STAMP Wastewater	Open Cut	176
W-8a S-11	STAMP Wastewater	HDD	0
W-8b W-8c	STAMP Wastewater	HDD	0
W-8d S-12	STAMP Wastewater	HDD	556
W-9	STAMP Wastewater	HDD	0
S-10	STAMP Wastewater	HDD	0
W-10 S-9	STAMP Wastewater	HDD/Staging Areas	9,418
S-17	STAMP Wastewater/Oak Orchard Discharge	HDD/Open Cut	150

ATTACHMENT A

CC Environment & Planning

Sheila S. Hess
Principal Ecologist/CEO

June 24, 2020

Mr. Mark Masse
Genesee County Economic Development Center
Via Email: mmasse@gcedc.com

Re: STAMP Water Main and Wastewater Wetland and Stream Delineation Summary

Dear Mark:
On behalf of CPL and Genesee County Economic Development Center (GCEDC), I have completed a field review of all of drainages, streams, and wetlands within the STAMP Water Main and Waste Water Area of Interest (AOI) located along approximately 16.8 miles of roads within the Towns of Alabama, Genesee County, NY, and Shelby, Orleans County, NY, including portions of Routes 63 and 77, along the sides of the roads indicated by the plan set provided. My review extended to all waters that are potentially regulated by state and federal agencies. The delineation was conducted in accordance with the U.S. Army Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1, and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (v. 2.0), dated January 2012. Delineation tasks included review of onsite conditions, field delineation, and sub-meter GPS survey of delineation. Deliverables include this delineation summary letter, delineation maps (Attachment A), photographs and datasheets (Attachment B), and shapefiles of mapped resources (provided via email on 6-23-20).

Desktop Review Notes

There are nine federally-mapped wetlands/wetland complexes indicated by the National Wetland Indicator (NWI Mapper) within the AOI and three state-mapped wetlands. There are eleven mapped streams within the AOI, all of which flow toward larger streams and NWI wetlands. These resources are included on the delineation maps provided in Attachment A. There are no listed plant or animal species mapped within this area according to the U.S. Fish & Wildlife Service online consultation database.

Field Mapped Wetlands and Streams

All wetlands were visually inspected and delineated during a field visit conducted on May 14 and 15, 2020 by Sheila Hess, Principal Ecologist, CC Environment & Planning. Wetland and stream features within the project area that could meet jurisdictional requirements were mapped using a Juniper Geode sub-meter GPS. Edges of wetlands and streams greater than 5 feet across were mapped to ensure that any aquatic feature potentially regulated by state and/or federal agencies was included within polygons. Streams less than 5 feet across were mapped as lines and their average width within the AOI is provided in Table 1 below. Wetland and stream features mapped include any permanent, seasonal, or intermittent streams and their bed and bank within the high-water mark (HWM) and wetland features showing appropriate vegetation, hydrology, and soils. Field investigation included inspection of floodplain and riparian areas associated with a stream or wetland. Delineation flags were hung in the field with the number of the waypoint (WPT) indicated.

Ten wetlands and sixteen streams and drainages were mapped within the AOI (see delineation Figure 1, the overview map and Figures 2-15 in Attachment A and photographic documentation and datasheets in Attachment B). Tables 1 below provides a description of each feature mapped and indicates in the Notes column if it is within the water main or wastewater project area. All mapped wetlands and streams require a jurisdictional determination to confirm their regulatory status. Mapped wetland and stream features were provided to CPL digitally as georeferenced shapefiles for inclusion within the project survey database and to facilitate updated design, plan sheets, and impact calculations.

Table 1. STAMP Water/Wastewater Wetland Delineation Stream Datasheet

Identifier	GPS Points	Flow Reg*/Dir	Description/Classification/ Connectivity	Est Bank Width	Notes
W-1	1-40	NA	PEM/Open Water	NA	Water Main Project.
W-2	41-100	NA	PEM/PSS/Open Water - Part of S-1	NA	Water Main Project.
S-1	48-49	P/N	Silt/Muck, straight, wetland	25’	Empties into Wetland 2. Water Main Project.
S-2	59-60	P/N	Vegetative, straight, wetland	20’	Flows in Wetland 2. Water Main Project.
S-3	73-76	P/N	Vegetative, straight, wetland	20’	Flows in Wetland 2. Water Main Project.
S-4	101-103	I/N	Vegetative, straight, wetland	4’	Flows in Wetland 3. Water Main Project.
W-3	101-108	NA	PEM/Open Water	NA	Water Main Project.
W-4	109-118	NA	PEM/scrub shrub	NA	Water Main Project.
S-5	109-115	I/NE	Vegetative, straight, wetland	4’	With Wetland 4. Water Main Project.
S-6	127-	P/E then N	Gravel, straight, wetland	4’	From Wetland 6. Wastewater Project.
W-5	119-126	NA	PEM/scrub	NA	Wastewater Project.
W-6	130-132	NA	PEM/Phrag Marsh	NA	Wastewater Project.
S-7	133-137	I/E	Silt, straight, drains from wetland	15’	Wastewater Project.
S-8a and 8b	NA		See Alabama WD No. 3 data		Wastewater Project.
S-16	138-143	P/NE	Silt, straight, oak orchard	25’-30’	Wastewater Project.
S-15	144-150	P/NE	Rock (Silt), moderate	40’	Oak Orchard Creek. Wastewater Project.
W-7	155-159	NA	PFO		Wastewater Project.
S-14	151-154	E/N	Silt, straight, drains from wetland into oak orchard	2’-4’	Drains from Wetland 7. Wastewater Project.

Table 1. STAMP Water/Wastewater Wetland Delineation Stream Datasheet					
Identifier	**GPS Points**	**Flow Reg*/Dir**	**Description/Classification/ Connectivity**	**Est Bank Width**	**Notes**
S-13	160-170	E/W	Vegetative, sinuous	4’	Flows into wetland. Wastewater Project.
W-8	171-208	NA	INWR - PEM, Reed Canary		Wastewater Project.
S-12	177-180	I/W	Vegetative, straight, yes	8’-10’	Flows into Wetland 8. Wastewater Project.
S-11	197-201	I/W	Vegetative, straight, yes	15’-20’	Connects to Wetland 8. Wastewater Project.
W-9	209-218	NA	PEM	NA	Wastewater Project.
S-10	219-227	E/W	Vegetative, straight, flows into wetland		Wastewater Project.
W-10	228-240	NA	INWR – PFO, Open Water	NA	Wastewater Project.
S-9	228-231	P/E	Silt, sinuous, flows wetland-10		Oak Orchard Creek. Wastewater Project.

Please contact me if you have any questions about the delineation and summary. If you require additional information, jurisdictional determination, or assistance with impact avoidance, minimization, and permitting please let me know.

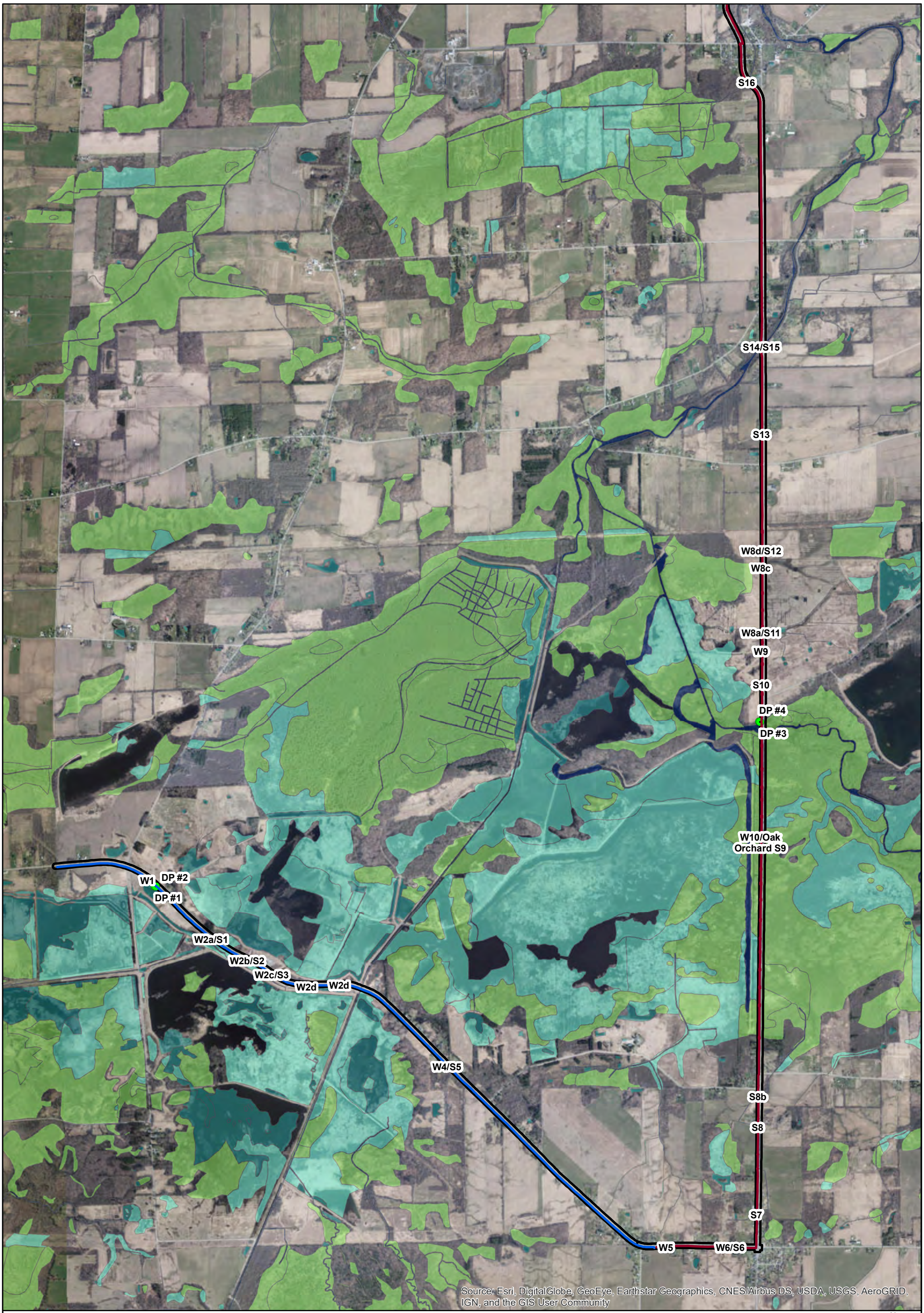
Sincerely,



Sheila S. Hess, Principal Ecologist
CEO CC Environment & Planning

Attachment A – Delineation Map and Figures
Attachment B – Photographs and Datasheets

Attachment A



Wetland and Stream Delineation Overview

STAMP Water Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

- Data Point
- Wetland/Stream
- Proposed Water Main
- Proposed Wastewater Main
- Water Main AOI
- Wastewater AOI

NWI Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

Figure 1

DP #1
W1
DP #2

0 0.0225 0.045 0.09 Miles

N

Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Data Point
Wetland/Stream
Proposed Water Main
Water Main AOI

NWI Wetlands

Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 2

W2a/S1

W2b/S2

W2c/S3

0 0.04 0.08 0.16 Miles

N

Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Wetland/Stream
Proposed Water Main
Water Main AOI

NWI Wetlands

Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 3

W2d

W2d W2d W2d

W3/S4

0 0.0375 0.075 0.15 Miles

N

Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

Wetland/Stream
Proposed Water Main
Water Main AOI

NWI Wetlands

Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 4



Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Wetland/Stream

Proposed Water Main

Water Main AOI

Figure 5



Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Wetland/Stream

Proposed Wastewater Main

Wastewater AOI

Figure 6

W6/S6

W6/S6

0 0.005 0.01 0.02 Miles

N

Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

Wetland/Stream

Proposed Wastewater Main

Wastewater AOI

Figure 7



Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

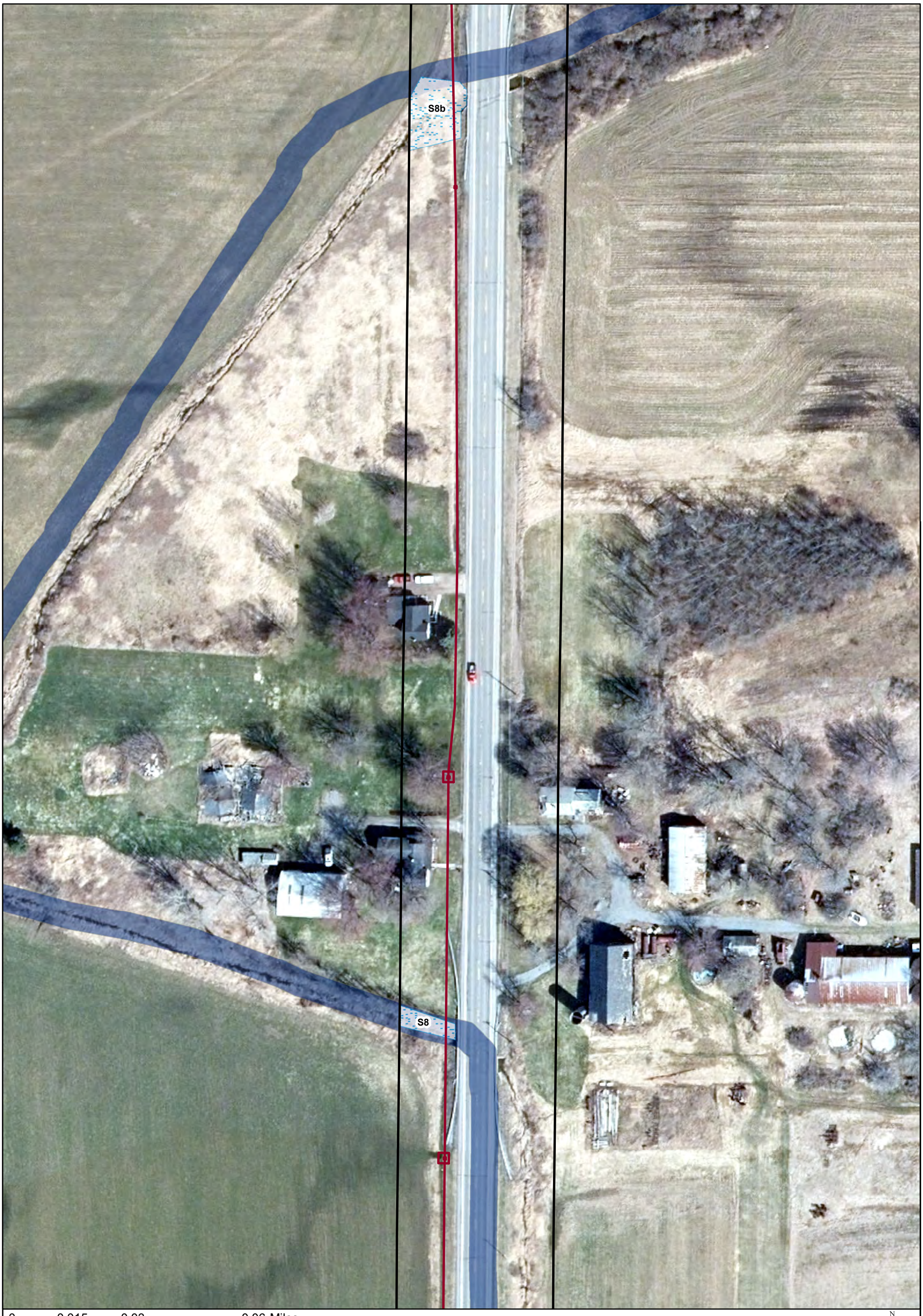
K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Wetland/Stream
Proposed Wastewater Main
Wastewater AOI

NWI Wetlands
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 8



Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

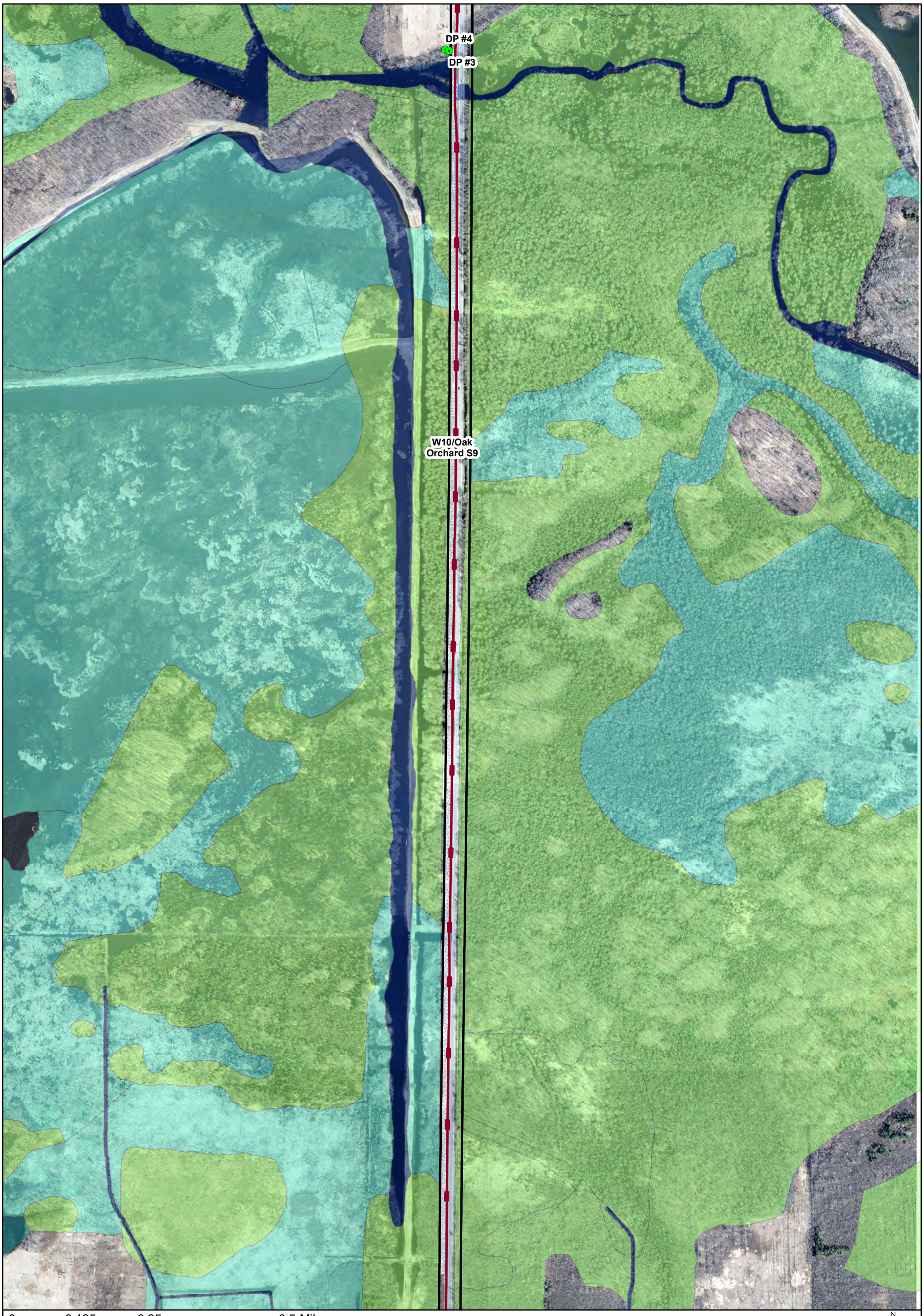
K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Wetland/Stream
Proposed Wastewater Main
Wastewater AOI

NWI Wetlands
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 9



Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Proposed Wastewater Main
Data Point
Wastewater AOI
Wetland/Stream

NWI Wetlands

Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 10

W8a/S11

W9

S10

0 0.0225 0.045 0.09 Miles

N

Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Wetland/Stream
Proposed Wastewater Main
Wastewater AOI

NWI Wetlands
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 11

W8d/S12

W8c

W8b

0 0.02 0.04 0.08 Miles

N

Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Wetland/Stream
Proposed Wastewater Main
Wastewater AOI

NWI Wetlands
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 12



Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Wetland/Stream

Proposed Wastewater Main

Wastewater AOI

Figure 13



0 0.0075 0.015 0.03 Miles

N

Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

CC Environment & Planning

Wetland/Stream
Proposed Wastewater Main
Wastewater AOI

NWI Wetlands

Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 14



0 0.005 0.01 0.02 Miles

N

CC Environment & Planning

Field Mapped Wetland/Stream

STAMP Water Main Delineation
Genesee and Orleans County, New York

K. Hojnacki, Date: 6/24/2020

Wetland/Stream
Proposed Wastewater Main
Wastewater AOI

NWI Wetlands

Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 15

Attachment B

STAMP Water/Wastewater Wetland Delineation Photos



W1 DP1 South



DP1 Soil



W1 DP1 North



DP2 North

STAMP Water/Wastewater Wetland Delineation Photos



W2 East



W2 East



W3 South



W4 South

STAMP Water/Wastewater Wetland Delineation Photos



W5 South



S6/W6 South



W7 North



W8 South

STAMP Water/Wastewater Wetland Delineation Photos



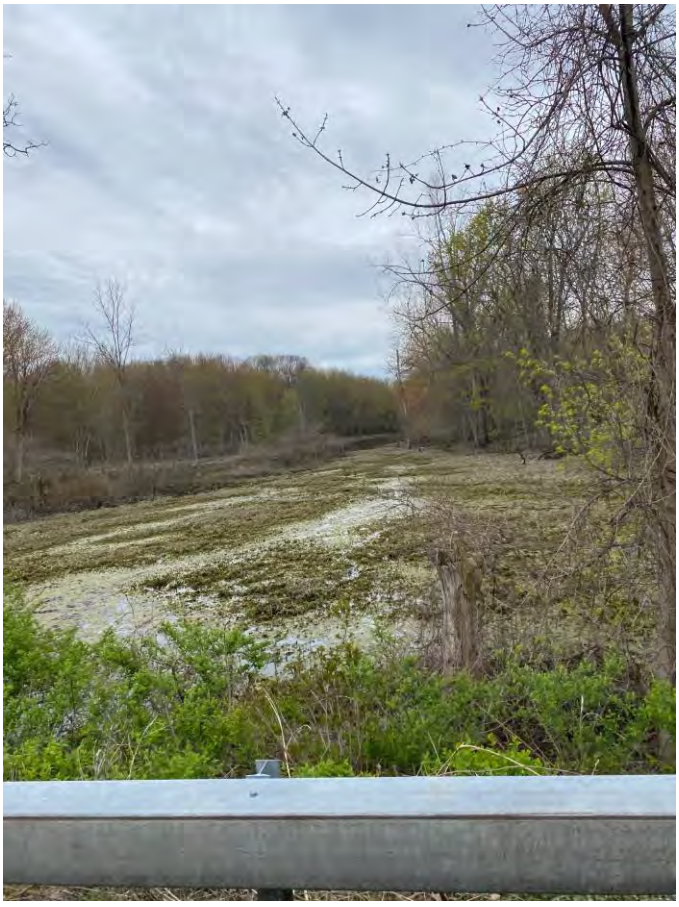
W9 West



W10 DP3 West



DP4 East



W10 S9 West

STAMP Water/Wastewater Wetland Delineation Photos



S1 West



S2 W2 South



S2 West



S3 East

STAMP Water/Wastewater Wetland Delineation Photos



S3 South



S4 East



S5 South



S7 East

STAMP Water/Wastewater Wetland Delineation Photos



S7 West



S10 East



S10 West



S11 East

STAMP Water/Wastewater Wetland Delineation Photos



S12 West



S13 West



S13 East



S14 North

STAMP Water/Wastewater Wetland Delineation Photos



S14 South



S15 Northeast



S15 Southwest



S16 Northeast

STAMP Water/Wastewater Wetland Delineation Photos



S16 Southwest



S10 North

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: STAMP Big Water City/County: Genesee Sampling Date: 5/14/2020

Applicant/Owner: GCEDC State: NY Sampling Point: 1

Investigator(s): SH/EH Section, Township, Range: Alabama

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0%

Subregion (LRR or MLRA): LRR L, MLRA 101 Lat: WPT1 Long: Datum: WGS84

Soil Map Unit Name: NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No	**within a Wetland?** **Yes** X **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches): 6
Water Table Present?	Yes	No	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No	Depth (inches):

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION– Use scientific names of plants. Sampling Point: 1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	50	Yes	FACW
2. *Phragmites australis*	40	Yes	FACW
3. *Open Water*	10	No	
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		180 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

_X_ 2 - Dominance Test is >50%

_X_ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					Mucky Peat	
6-18	10YR 3/2	90	10YR 4/6	10	C	PL/M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ? Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: STAMP Big Water City/County: Genesee Sampling Date: 5/14/2020

Applicant/Owner: GCEDC State: NY Sampling Point: 2

Investigator(s): SH/EH Section, Township, Range: Alabama

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0%

Subregion (LRR or MLRA): LRR L, MLRA 101 Lat: WPT2 Long: Datum: WGS84

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes	No X	**within a Wetland?** **Yes** **No** X
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? **Yes** **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION– Use scientific names of plants. Sampling Point: 2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 5)			
1. *Barbarea vulgaris*	30	Yes	FAC
2. *Alliaria petiolata*	15	No	FACU
3. *Lonicera morrowii*	10	No	FACU
4. Grass Unknown	40	Yes	
5. *Phalaris arundinacea*	5	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	30	x 3 =	90
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	60 (A)		200 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

No hydro, no veg/no soil data

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: STAMP Wastewater City/County: Genesee/Orleans Sampling Date: 5/14/2020

Applicant/Owner: GCEDC State: NY Sampling Point: 3

Investigator(s): SH/EH Section, Township, Range: Alabama

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0%

Subregion (LRR or MLRA): LRR L, MLRA 101 Lat: WPT Long: Datum: WGS84

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**
Hydric Soil Present?	Yes	No X	**within a Wetland?** **Yes** **No** X
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- X Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches): 10

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION– Use scientific names of plants. Sampling Point: 3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	60	Yes	FAC
2. *Fraxinus pennsylvanica*	20	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	80	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Cephalanthus occidentalis*	15	Yes	OBL
2. *Frangula alnus*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	25	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Lysimachia nummularia*	60	Yes	FACW
2. *Iris versicolor*	10	No	OBL
3. *Phragmites australis*	15	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. *Toxicodendron radicans*	20	Yes	FAC
2.			
3.			
4.			
	20	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	95	x 2 =	190
FAC species	90	x 3 =	270
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	210 (A)		485 (B)

Prevalence Index = B/A = 2.31

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

_X_ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Mucky Peat	
4-10	10YR 3/1	95	10YR 5/6	5	C	M		Prominent redox concentrations
10-16	10YR 4/1	50						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: STAMP Wastewater City/County: Genesee/Orleans Sampling Date: 5/14/2020

Applicant/Owner: GCEDC State: NY Sampling Point: 4

Investigator(s): SH/EH Section, Township, Range: Alabama

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0%

Subregion (LRR or MLRA): LRR L, MLRA 101 Lat: Long: Datum: WGS84

Soil Map Unit Name: NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes	No X	**within a Wetland?** **Yes** **No** X
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- ? Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No	Depth (inches):
Water Table Present?	Yes	No	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No	Depth (inches):

Wetland Hydrology Present? **Yes** **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION– Use scientific names of plants. Sampling Point: 4

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	5	No	FACW
2. *Frangula alnus*	40	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	45	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Lonicera morrowii*	70	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	70	=Total Cover	
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	40	x 3 =	120
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	115 (A)		410 (B)

Prevalence Index = B/A = 3.57

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

No Hydrology, No Veg, no soil data required.

ATTACHMENT B

CC Environment & Planning

Sheila S. Hess
Principal Ecologist/CEO

June 26, 2020

Mr. Mark Masse
Genesee County Economic Development Center
Via Email: mmasse@gcedc.com

Re: STAMP Station Wetland and Stream Delineation Summary

Dear Mark:

I have completed a field review of all of drainages, streams, and wetlands within the 20-acre STAMP Station located immediately north of the STAMP site in the Town of Alabama, Genesee County, NY. My review extended to all waters that are potentially regulated by state and federal agencies. The delineation was conducted in accordance with the U.S. Army Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1, and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (v. 2.0), dated January 2012. Delineation tasks included review of onsite conditions, field delineation, and sub-meter GPS survey of delineation. Deliverables include this delineation summary letter, delineation map, photographs and datasheets (Attachment A), and shapefiles of mapped resources (provided via email May 2020).

Desktop Review Notes

There is one federally-mapped wetland indicated by the National Wetland Indicator (NWI Mapper) within the area of investigation (AOI). There are no state-mapped wetlands and no mapped streams. There are no listed plant or animal species mapped within this area according to the NYS Department of Environmental Conservation and U.S. Fish & Wildlife Service online consultation databases.

Field Mapped Wetlands and Streams

All wetlands were visually inspected and delineated during a field visit conducted on August 5, 2019 by Sheila Hess, Principal Ecologist, CC Environment & Planning. Wetland and stream features within the project area that could meet jurisdictional requirements were mapped using a Juniper Geode sub-meter GPS. Wetland and stream features mapped include any permanent, seasonal, or intermittent streams and their bed and bank within the high-water mark (HWM) and wetland features showing appropriate vegetation, hydrology, and soils. Field investigation included inspection of floodplain and riparian areas associated with a stream or wetland. Delineation flags were hung in the field with the number of the waypoint (WPT) indicated.

Two wetlands were mapped within the AOI (see delineation map, photographic documentation and datasheets in Attachment A). Mapped wetlands require a jurisdictional determination to confirm their regulatory status. Mapped wetlands were provided to Genesee County Economic Development Center digitally as georeferenced shapefiles for inclusion within the project survey database and to facilitate updated design, plan sheets, and impact calculations.

Please contact me if you have any questions about the delineation and summary. If you require additional information, jurisdictional determination, or assistance with impact avoidance, minimization, and permitting please let me know.

Sincerely,



Sheila S. Hess, Principal Ecologist
CEO CC Environment & Planning

Attachment A – Delineation Map, Photographs and Datasheets

Attachment A


STAMP Station
Delineated Wetlands 8-5-19
CC Environment & Planning
Legend
AOI
Trib
Up DP
Wet DP
Wetland
Google Earth
© 2018 Google
N
1000 ft

STAMP Station Data Point 2 – Palustrine Forested Wetland









WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Delmar City/County: Alabama/Genesee Sampling Date: 8/5/19

Applicant/Owner: GCEDC State: NY Sampling Point: 1

Investigator(s): S. Hess Section, Township, Range: Alabama

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0.10

Subregion (LRR or MLRA): LRR L Lat: WPT Long: Datum: WGS 84

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes	No 0	**within a Wetland?** **Yes** **No** X
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? **Yes** **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION– Use scientific names of plants. Sampling Point: 1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tilia americana*	20	Yes	FACU
2. *Carya glabra*	30	Yes	FACU
3. *Acer saccharinum*	50	Yes	FACW
4.			
5.			
6.			
7.			
	100	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Carpinus caroliniana*	25	Yes	FAC
2. *Lindera benzoin*	10	Yes	FACW
3. *Fraxinus americana*	15	Yes	FACU
4.			
5.			
6.			
7.			
	50	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Persicaria virginiana*	50	Yes	FAC
2. *Fraxinus americana*	25	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. *Vitis vulpina*	10	No	FAC
2. *Toxicodendron radicans*	25	Yes	FAC
3. *Parthenocissus quinquefolia*	25	Yes	FACU
4.			
	60	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	110	x 3 =	330
FACU species	115	x 4 =	460
UPL species	0	x 5 =	0
Column Totals:	285 (A)		910 (B)

Prevalence Index = B/A = 3.19

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** ____

Remarks:

No hydrology or wetland veg, no soil test.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Delmar City/County: Alabama/Genesee Sampling Date: 8/5/19

Applicant/Owner: GCEDC State: NY Sampling Point: 2

Investigator(s): S. Hess Section, Township, Range: Alabama

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0.10

Subregion (LRR or MLRA): LRR L Lat: Long: Datum: WGS 84

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No	**within a Wetland?** **Yes** X **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: 1

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- X Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches): 8

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION– Use scientific names of plants. Sampling Point: 2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus bicolor*	10	Yes	FACW
2. *Carya laciniosa*	10	Yes	FACW
3. *Fraxinus americana*	20	Yes	FACU
4. *Tilia americana*	10	Yes	FACU
5. *Acer saccharinum*	10	Yes	FACW
6.			
7.			
	60	=Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Fraxinus americana*	20	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	
Herb Stratum (Plot size:)			
1. *Pilea pumila*	25	Yes	FACW
2. *Boehmeria cylindrica*	25	Yes	OBL
3. *Impatiens capensis*	20	Yes	FACW
4. *Bare ground*	30	Yes	
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	=Total Cover	
Woody Vine Stratum (Plot size:)			
1. *Vitis*	15	Yes	FAC
2. *Parthenocissus quinquefolia*	10	Yes	FACU
3.			
4.			
	25	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 12 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 58.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	75	x 2 =	150
FAC species	15	x 3 =	45
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	175 (A)		460 (B)

Prevalence Index = B/A = 2.63

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

_X_ 2 - Dominance Test is >50%

_X_ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 2.5/1	100						
6-10	7.5YR 2.5/1	95	7.5YR 5/8	5	C	M		Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks: