

REVISED 3-18-16

**AGENDA
REGULAR MEETING OF THE MAYOR AND COUNCIL
March 22, 2016
SEAFORD CITY HALL - 414 HIGH STREET**

- 7:00 P.M. – Mayor David Genshaw calls the Regular Meeting to Order.
- Invocation
 - Pledge of Allegiance to the Flag of the United States of America.
 - Changes to agenda for this meeting.
 - Executive Session - Personnel
 - Approval of minutes of the Regular Council meeting of March 8, 2016.

CORRESPONDENCE:

- 1.

NEW BUSINESS:

1. Jeanne Sapp, Billing Representative to present the information on penalty and processing and collection of penalty on customer billings.
2. Present a request from Trinity Logistics to use the right-of-way area for additional parking at their facility located at 50 Fallon Avenue.
3. Mrs. Judy Schwartz to present information on the final report for Sea Level Rise Vulnerability Study.
4. Mrs. Judy Schwartz to discuss the Wastewater Treatment Facility Nation Pollutant Discharge Elimination System (NPDES) permit compliance schedule response related to capacity.
5. Present request from Belle Ayre Investments, LLC to retroactively approve an extension of the sunset for the site approval for the Belle Ayre subdivision from 1/14/15 through 1/14/17.
6. Present the recommendation for the request for proposal Annual Auditor award.

Agenda

Regular Meeting of the Mayor and Council
March 22, 2016

OLD BUSINESS:

1.

REMINDER OF MEETINGS & SETTING NEW MEETINGS:

1. Delaware League of Local Governments, Duncan Center, Dover
March 24 @ 6 p.m.

CITY OF SEAFORD

Municipal Election - April 16, 2016

The City of Seaford Municipal Election will be held on Saturday, April 16, 2016 in the City Council Chambers, City Hall, 414 High Street, between the hours of 7:00 a.m. E.S.T. and 3:00 p.m. E.S.

One (1) Mayor will be elected for a (2) year term

Candidate filed - Mayor David Genshaw

(Note - Mayor Genshaw will not appear on the ballot as he is the only candidate for the Mayor's Office.)

One (1) Council Member will be elected for a (3) year term

Candidates filed - Frank Daniel Cannon, Jr.

- Councilwoman Leanne Phillips-Lowe

Anyone eighteen (18) years of age or older who is a bona fide resident to be eligible to vote, **must have been registered at the Seaford City Hall by 5:00 p.m., E.S.T., March 25, 2016.** A nonresident property owner to be eligible to vote must be owner of record for a period of six (6) months immediately preceding the date of the Annual Municipal Election (October 16, 2015) and shall have one vote **provided he or she is registered on the "Books of Registered Voters maintained at the City Hall. Registration hours are Monday through Friday, 8 a.m. until 5 p.m. or by appointment if you cannot register during these normal business hours.** The City of Seaford has independent registration procedures for the Annual Municipal Election. **To vote, you must meet the eligibility**

requirements and be registered on the "Books of Registered Voters" maintained at City Hall.

DUE TO FRIDAY, MARCH 25, 2016 BEING A CITY OF SEAFORD HOLIDAY THE OFFICES WILL BE CLOSED. WE ENCOURAGE ALL INTERESTED RESIDENTS TO REGISTER PRIOR TO THE DEADLINE.

A person shall be required to register only one time. You are urged to check your registration if you did not vote in the last municipal election. If you have moved out of the City after your original registration, you will need to check your registry to assure you are an eligible voter.

All voters will need to show proof of residency which may be a State of Delaware driver's license, a State of Delaware identification card, a federal or state tax return with address, a City of Seaford utility bill or real estate property tax bill, or other acceptable proof of residency or ownership.

COMMITTEE REPORTS:

1. Police & Fire - Councilwoman Leanne Phillips-Lowe
2. Administration - Councilman H. William Mulvaney III
3. Parks and Recreation - Councilman Orlando Holland
4. Operations Committee - Councilman Dan Henderson
5. Electric - Councilwoman Peterson

Mayor Genshaw solicits a motion to hold an Executive Session for the purpose of discussing personnel.

Executive Session

1. Personnel

Mayor Genshaw solicits a motion to adjourn the regular council meeting.

NOTE: Agenda shall be subject to change to include or delete Additional items (including executive session) which arise at the time of the meeting. (29 Del. C. S1004 (e) (3))

City of Seaford

N.B.1
3/22/16

Billing & Collection

1. Meter readings are obtained once a month.
2. Billings are calculated from the meter readings and mailed to the customer.
3. Bills are typically due around the 25th of the month. However, a grace period exists until the 5th of the following month.
4. If a utility bill is not paid by 5 pm on the 5th of the month, 1.5% penalty is assessed on the past due outstanding balance. Penalty is considered a "demand" charge, meaning due upon assessment.
5. When payments are received and entered into the Cash Receipt system, the system automatically applies the payment to any penalty first and principal balance second. **We checked with other utility providers and our software provider and this is the standard practice.**
6. If penalty is assessed and paid prior to the next bill being generated, the customer will not see a penalty charge on that next bill. Any balances remaining will be shown as an outstanding or previous service balance.

Example #1: A customer owes a total of \$191.31 and does not pay by the 5th: \$21.95 Water, \$44.30 Sewer, and \$125.06 Electric. Penalty is assessed: \$0.33 Water, \$0.66 Sewer, and \$1.88 Electric. The customer makes a payment of \$191.31 on the 8th. The payment is applied to penalty first and then to the Water, Sewer, and Electric service balances. When the next bill is generated on the 10th, a previous balance of \$0.33 Water, \$0.66 Sewer, and \$1.88 Electric is shown because the penalty has already been paid.

Example #2: A customer owes a total of \$113.29 and does not pay by the 5th: \$113.29 Electric. Penalty is assessed: \$1.70 Electric. The customer does NOT make a payment. When the next bill is generated on the 10th, a previous balance of \$113.29 Electric is shown and penalty of \$1.70 is shown because no payment has been made.

To avoid any penalty being assessed, the customer must pay their bill in full anytime from receipt of the bill until 5 p.m. on the 5th of the month.

Bill Payment Options

The City accepts the following forms of payment:

1. Cash
2. Check or Money Order
3. Automated Bank Draft – Processed on the 1st business day of the month. Forms available at the City Hall office.
4. On-line Payments (City's Website) – Credit/Debit Card or Electronic Check. Convenience fee applies. Payments scheduled by 11:59 pm on that day will be processed as of the next business day. Visit our web site at www.seafordde.com.
5. On-line Payments (Customer's Bank) – A customer may set up payments through his/her bank's on-line payment system. Even though the customer is not physically writing a check, the bank is writing and mailing a check to the City of Seaford. This form of payment requires additional processing time because it is NOT automatic or "electronic". If the customer schedules the payment as of the 5th of the month, the City may not receive it for several days after that date because of the mail service.

E-Bills Available

Want to have your bill information available at your fingertips with a click of a button? Sign up for E-Bills today by calling the office at 302.629.9173 or email your request to jsapp@seafordde.com.

For more information about our billing or payment options, please contact customer service at 302.629.9173.



*solutions-driven team,
service-driven culture*

March 7, 2016

*Agenda
3/22/16
N.B.2*

Mayor & City Council
City of Seaford
414 High Street
Seaford, Delaware 19973

Re: 50 Fallon Avenue, Seaford DE
Existing Right-of-Way

Dear Mayor Genshaw & City Council:

Please accept this letter as a formal request for the use of an existing right-of-way from the current building known as Trinity Logistics, located at 50 Fallon Avenue extending north to the existing curb-line on 50 Fallon Avenue, Seaford, DE 19973. This request for the use of an existing right-of-way is in regards to additional parking at Trinity Logistics.

Please let me know if you have any question or need any further information and I will be glad to provide you with that.

Thank you for your cooperation in this matter.

Sincerely,

Bill Hurley

Bill Hurley
Facilities Team Lead

N.B.S
3/22/16

BELLE AYRE INVESTMENTS, LLC
102 Larch Circle, Suite 203
Wilmington, Delaware 19804
302/658-4417 ext 3043
Fax 302/658-0618

February 29, 2016

VIA email: jlittleton@seafordde.com

Mayor and Council
City of Seaford
414 High Street
Seaford, DE 19973

RE: Belle Ayre

Dear Mayor and Council,

We are requesting that the sunset of the site approval, for the subdivision of Belle Ayre be extended. Our final site plan approval sunset on 1/14/15 and we are requesting another 2 year extension from 1/14/15 through 1/14/17. We just received an extension from Sussex Conservation District, which expires on March 27, 2019. We currently have a national builder interested in the project.

We would ask that a favorable response be granted, as we are seeing an increase in traffic and interest.

Respectfully Requested,


Mark Prata
Belle Ayre Investments, LLC

N.B.L
3/22/16

To: Dolores J. Slatcher, City Manager
From: June Merritt, Director of Finance & Human Resources 
Date: March 18, 2016
Subject: Audit Services RFP – Recommendation

The City solicited the services of qualified firms of certified public accountants to audit its financial statements for the five fiscal years ending June 30, 2016, 2017, 2018, 2019, and 2020 and to prepare the Data Collection Form for the same fiscal years.

We advertised and sent requests for proposals to eight companies and received four responses. The four responding firms were reviewed for their costs proposals and how well they completed the specifications in the RFP. Each firm was scored on the ability to have qualified available staff, experience with governmental audits, understanding of the scope of the audit, location of firm, price, and the rater's confidence in the firm. Aside from location and price each responding firm received the highest points available for each category.

The two highest ranking firms were SB & Company LLC and PKS & Company P.A., each with a score of 85. SB & Company is also the firm with the lowest audit services fee. I contacted their references and received above satisfactory recommendations from each.

I am recommending that the City award the contract for audit services to the low bidder, SB & Company LLC based upon my review of their submittal and the vetting of their references.



SEA LEVEL RISE VULNERABILITY STUDY

SEAFORD WASTEWATER TREATMENT FACILITY

CMAG GRANT NO. PO279977
GMB PROJECT NO. 150083



Prepared for:

CITY OF SEAFORD, DELAWARE

MARCH 2016

This study was prepared by GMB on behalf of the City of Seaford using Federal funds under award NA14 NOS 419 0123 from the Delaware Coastal Programs and the Office for Coastal Management (OCM), National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the OCM, NOAA or the U.S. Department of Commerce.

GMB

GEORGE, MILES & BUHR, LLC

ARCHITECTS/ENGINEERS

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SEAFORD, DE 19973
302.628.1421

SALISBURY/BALTIMORE/SEAFORD



SEA LEVEL RISE VULNERABILITY STUDY
SEAFORD WASTEWATER TREATMENT FACILITY
SEAFORD, DELAWARE
TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

1.0 INTRODUCTION 3

1.1 Wastewater Treatment Facility 3

1.2 Climate Change and Sea Level Rise 3

1.3 Scope of Study..... 4

2.0 GROUND BASED SURVEY..... 6

3.0 SEA LEVEL RISE INUNDATION MAPPING 7

3.1 Sea Level Rise Scenarios..... 7

3.2 Flood Elevations 9

4.0 VULNERABILITY ASSESSMENT..... 10

4.1 WWTF Assets..... 10

4.2 Risk Analysis 12

4.3 WWTF Planning Horizon 14

4.4 Mitigation Options 14

5.0 CONCLUSION..... 22

LIST OF FIGURES

- Figure 1: DNREC Sea Level Rise Scenarios
Figure 2: Map of Key WWTF Assets
Figure 3: Inventory of Key Assets

APPENDICES

- Exhibit 1-1: 0.5 M Sea Level Rise (35 Year Projection)
Exhibit 1-2: 1.0 M Sea Level Rise (60 Year Projection)
Exhibit 1-3: 1.5 M Sea Level Rise (85 Year projection)
- Exhibit 2-1: 100 Year Floodplain (2015)
Exhibit 2-2: 100 Year Floodplain + 1.0 FT (20 Year Projection)
Exhibit 2-3: 100 Year Floodplain + 1.5 FT (30 Year Projection)
Exhibit 2-3: 100 Year Floodplain + 2.0 FT (40 Year Projection)
Exhibit 2-3: 100 Year Floodplain + 3.0 FT (55 Year Projection)

EXECUTIVE SUMMARY

Delaware's coastal communities are threatened by sea level rise. This threat not only affects those communities along the Delaware and Inland Bays but also those within the Chesapeake Bay watershed. Sea levels are rising globally as a result of the warming of ocean waters and the melting of land based glaciers and ice sheets. In addition, locally, land subsidence is projected to worsen the effects of sea level rise. Land subsidence of the Chesapeake Bay region is occurring due to extensive withdrawal of groundwater and resulting compaction of underground water bearing aquifers. It is projected that land subsidence will double the impact of sea level rise on the Delmarva Peninsula.

In recognition of these natural threats, the Department of Natural Resources & Environmental Control (DNREC) and Delaware's Sea Level Rise Advisory Committee have published sea level rise forecasts and recommendations for adapting to sea level rise. Additionally, DNREC has offered grant funding to municipal and county governments for planning studies that increase resiliency to sea level rise.

In June 2015, the City of Seaford received a DNREC Coastal Management Assistance Grant (CMAG) to study the vulnerability of the Wastewater Treatment Facility (WWTF) as the first step in recognition of the risks of sea level rise for Seaford. The vulnerability study included ground-based surveys, GIS mapping, inventory of critical elements, and assessment of risk under various sea level rise scenarios.

DNREC has predicted a sea level rise of up to 1.5 meters (nearly 5 ft.) by the year 2100, as a worst case. For planning the next WWTF upgrade/expansion, a 30-year projection of 1.5 feet of sea level rise should be considered. Under these conditions, certain essential structures will be subject to flooding including the primary pumping station, blower building, chlorine

contact tank and portions of Nanticoke Avenue which serves as a public street and access road for the WWTF.

The results of the vulnerability study were presented by Judy A. Schwartz, P.E. of George, Miles & Buhr, LLC (GMB) at the January 12, 2016 meeting of the Seaford City Council. This report documents the findings of the study and identifies next steps that will aid Seaford in planning for the next WWTF upgrade.

GMB wishes to give special thanks to Danielle Swallow of DNREC Delaware Coastal Programs, and Susan Love, formerly of DNREC Coastal Programs, for their technical guidance and valuable feedback throughout the initiation and execution of this study.

This study was prepared by GMB, on behalf of the City of Seaford, using Federal funds under award NA14 NOS 419 0123 from the Delaware Coastal Programs and the Office for Coastal Management (OCM), National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the OCM, NOAA or the U.S. Department of Commerce.

1.0 INTRODUCTION

1.1 *Wastewater Treatment Facility*

The City of Seaford owns and operates a Wastewater Treatment Facility (WWTF) located along the bank of the Nanticoke River, a major tributary of the Chesapeake Bay. The WWTF is a Biological Nutrient Removal (BNR) plant designed to treat 2.0 million gallons per day (mgd) of wastewater. It receives a combination of residential, commercial and industrial wastes from the City of Seaford and the Town of Blades. In addition, it receives septage from septic haulers in the greater Seaford area and landfill leachate from the Delaware Solid Waste Authority. The WWTF was originally constructed in the early 1960's on low-lying lands that were filled. Major upgrades/expansions were completed in 1980 and 1998.

The WWTF discharges treated effluent to the Nanticoke River as authorized under a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES permit was last renewed in November 2015 for a five-year period. The recently renewed NPDES permit introduced more restrictive effluent limitations that will require an upgrade of the WWTF for Enhanced Nutrient Removal (ENR). In addition, the NPDES permit contains a compliance schedule which calls for completion of a planning study by January 31, 2017, design drawings and permits by January 31, 2021, and construction of upgrade and expansion by January 31, 2023.

1.2 *Climate Change and Sea Level Rise*

There is strong scientific consensus that the Earth is undergoing adverse global climate change. Of particular significance are the upward trends of global warming which are most likely human-induced and are proceeding at an unprecedented rate. The impacts associated with global warming include shrinking ice sheets, melting glaciers, decreased snow cover,

warming ocean temperatures, ocean acidification, loss of marine and coastal habitat, extreme storm events, and sea level rise.

Locally, within the Chesapeake Bay region, the effects of sea level rise are worsened by a phenomena known as land subsidence, which is a sinking of the Earth's surface. Land subsidence is principally caused by aquifer compaction due to extensive withdrawal of groundwater. The historical rate of sea level rise within the Chesapeake Bay region is about double that of other parts of the world, due to land subsidence.

According to scenarios developed by DNREC Delaware Coastal Programs, the level of Delaware's tidal rivers is expected to rise between 0.5 to 1.5 meters by the end of the 21st century. This rate equates to an average of 6 to 18 mm per year (0.23" to 0.7" per year).

1.3 Scope of Study

A planning grant was secured by the City of Seaford to conduct a Vulnerability Study as the first step in recognition of the risks of sea level rise at the Seaford WWTF. The Vulnerability Study was designed to meet program goals for increasing Delaware's coastal resiliency through database development and sea level rise adaptation planning. The Vulnerability Study was comprised of the following tasks:

Task 1 - Ground Based Survey and Sea Level Rise Inundation Mapping

- a. Perform ground based survey of all WWTF buildings and tanks, collecting "top of wall" and "finished floor" elevations within a vertical accuracy of 1 inch.
- b. Review existing sea level rise projections and choose appropriate scenarios for Seaford's vulnerability assessment. Updated FEMA floodplain maps shall also be considered for use in this task.
- c. Incorporate the ground-based elevation data into a GIS format for inundation mapping.
- d. Generate sea level rise inundation maps of the WWTF under selected scenarios.

Task 2 – Inventory of Essential Structures

- a. Review scenario mapping and identify critical WWTF buildings, tanks or other structures at risk of flooding during one or more scenarios. Extent of flooding shall be noted.
- b. The inventory shall describe the type of structure, why it is critical to continuity of operation, and assess the level of risk under different sea level rise scenarios.
- c. The inventory shall assign a priority scale to each inundated structure based on degree of risk and how integral it is to the operation of the facility. It shall consider single points of failure and redundancy when evaluating impacts of flooding.

2.0 GROUND BASED SURVEY

A ground-based survey was conducted in July 2015 to within a vertical accuracy of less than 1 inch. All survey data was referenced to the Delaware State Plane Horizontal Coordinate System of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD88). The ground-based survey included collection of "top of wall" and "finished floor" elevations allowing the tanks and buildings to be differentiated from the surrounding grade elevations. Several of the Seaford WWTF treatment tanks rise high above the ground. In an extreme high tide, the water may rise to the base of the tank without overflowing into the tank. Recognition of this distinction will be important for developing mitigation measures.

The ground-based survey data was converted to a three-dimensional surface model and classified using ArcGIS to display elevations values based on specific flood events and sea level rise scenarios. The GIS models were georeferenced with imagery provided by ESRI to accurately show where the flooding would occur in its proper geographic location.

3.0 SEA LEVEL RISE INUNDATION MAPPING

3.1 Sea Level Rise Scenarios

Figure 1 was developed by the DNREC Sea Level Rise Technical Workgroup in December 2009. The graph shows the minimum, intermediate, and maximum rates of expected sea level based on a compilation of available data. The workgroup suggested that project sensitivity be the basis for selecting the appropriate curve. For example, low sensitivity projects should consider a minimum of 0.5 meters of sea level rise by the Year 2100, while high sensitivity projects should plan on 1.5 meters of sea level rise by the Year 2100.

Figure 1

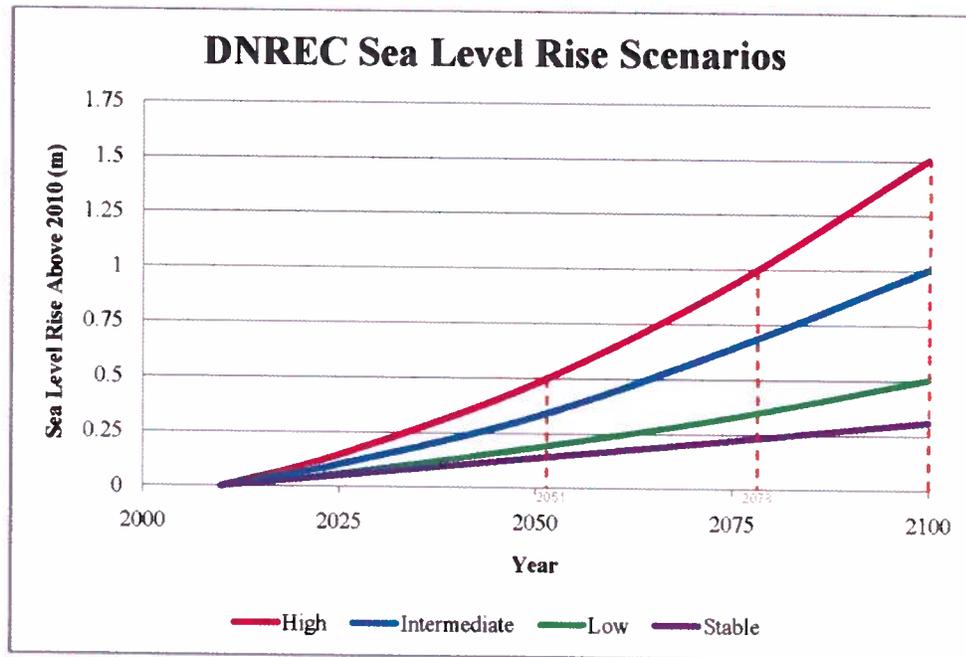


Figure 1. Proposed DNREC SLR scenarios 2010-2100.

It is the intention of the DNREC SLR Technical Workgroup that these SLR scenarios be reviewed and update periodically as new information and federal guidelines become available.

Due to the criticality of the Seaford WWTF with respect to public health and safety, the high sensitivity curve was considered for the vulnerability analysis. Accordingly, maps were generated for the following sea level rise scenarios:

- 0.5 M Sea Level Rise – Using the high sensitivity curve, this scenario represents a 35-year projection of sea level rise
- 1.0 M Sea Level Rise – This scenario represents a 60-year projection of sea level rise
- 1.5 M Sea Level Rise – This scenario represents an 85-year projection of sea level rise

The Sea Level Rise maps are provided as Exhibits 1-1 through 1-3 in the Appendix.

3.2 Flood Elevations

Portions of the Seaford WWTF site are subject to tidal flooding. The computed elevation to which floodwater is anticipated to rise during a 100-year frequency flood is known as the Base Flood Elevation (BFE). The BFE is determined by FEMA (Federal Emergency Management Agency) and updated regularly. The most recent FEMA floodplain maps are dated March 16, 2015 and indicate a BFE of 6.0 feet (NAVD88).

Exhibit 2-1 portrays the areas of flood inundation at the Seaford WWTF using the current 100-year Base Flood Elevation of 6.0 feet (NAVD88). Maps were also generated for future scenarios of flood inundation as impacted by sea level rise:

- 100 Year Floodplain + 1.0 ft Sea Level Rise - This scenario represents a 20-year projection of sea level rise
- 100 Year Floodplain + 1.5 ft Sea Level Rise - This scenario represents a 30-year projection of sea level rise
- 100 Year Floodplain + 2.0 ft Sea Level Rise - This scenario represents a 40-year projection of sea level rise
- 100 Year Floodplain + 3.0 ft Sea Level Rise - This scenario represents a 55-year projection of sea level rise

The flood maps are provided as Exhibits 2-1 through 2-5 in the Appendix.

4.0 VULNERABILITY ASSESSMENT

The vulnerability study was designed to assess the level of risk of WWTF assets under various sea level rise scenarios. The assessment is based upon a comparison of the future predicted flood levels to the existing elevations of WWTF infrastructure.

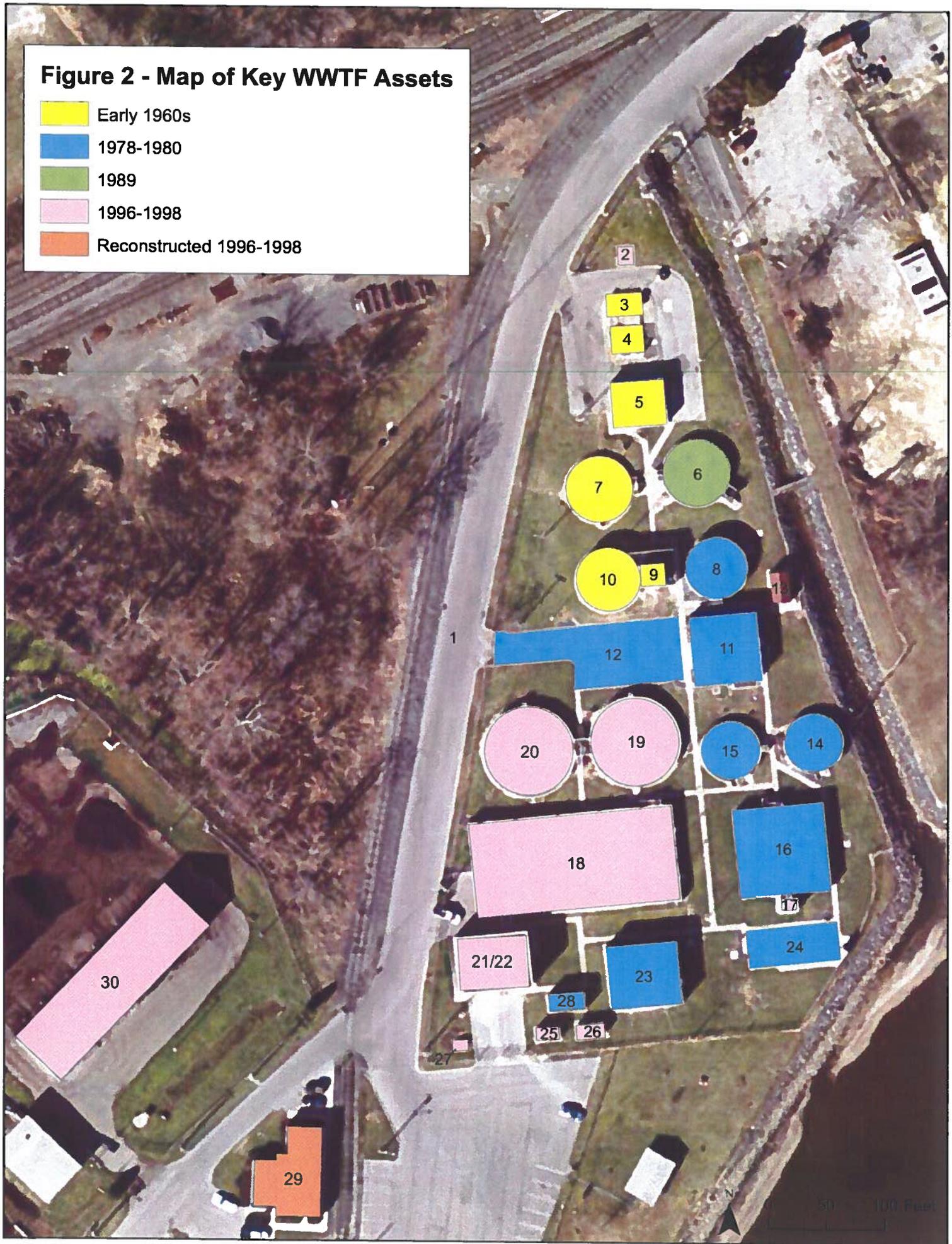
Grade elevations throughout the WWTF site range from approximately 4 to 9+. The lowest surveyed point on the site occurs on Nanticoke Avenue at Elev. 4.07 while the highest surveyed point is the top of the Sludge Blend Tank at Elev. 21.22. The lowest building is the Primary Pumping Station which has a finished floor elevation of 6.62 at the ground floor. Both the Primary Pumping Station and the Control Building have lower floor levels which are waterproof and below the groundwater level even under normal non-flood conditions. These lower levels are not considered to be at risk to increasing sea levels.

4.1 WWTF Assets

The WWTF is comprised of a very complex infrastructure system that supports the processes and operations of the plant. The WWTF physical assets have a range of ages, with the oldest assets dating back to the early 1960s. The infrastructure includes above grade structures, such as buildings and tanks, along with underground assets, such as piping and conduits. The underground assets are generally waterproof and less susceptible to flooding impacts. Figure 2 displays the essential elements that are vulnerable to sea level rise and flooding.

Figure 2 - Map of Key WWTF Assets

- Early 1960s
- 1978-1980
- 1989
- 1996-1998
- Reconstructed 1996-1998



4.2 Risk Analysis

Figure 3 presents an inventory of the key WWTF assets, along with the extent of predicted flooding for each sea level rise and flood scenario. The inventory demonstrates that in the absence of flood conditions, the essential tanks and buildings are not subject to inundation with the predicted sea level rise. Only the plant access road and small parking lot are subject to inundation. However, under flood conditions as worsened by sea level rise, several tanks and buildings become vulnerable, or “at risk”, to varying degrees. Each at-risk element was assigned a rating on a scale of 1 to 5 based upon the degree of risk and how integral it is to the operation of the WWTF. Further discussion of the at-risk elements is presented in the Mitigation Options subsection.

Seaford WWTF Vulnerability Study
Inventory of Key Assets

Figure 3

WWTF Asset	Survey Reference	Elevation	Sea Level Rise Inundation (measured in feet)			100-YR Flood Inundation (measured in feet)				Priority Rating
			0.5 m (35 Year)	1.0 m (60 Year)	1.5 m (85 Year)	Flood (2015)	Flood + 1.0' (20 Year)	Flood + 1.5' (30 Year)	Flood + 2.0' (40 Year)	
1 Nanticoke Ave - Plant Access Road	Grade	4 to 9+		0.45	2.09	2.00	3.00	3.50	4.00	3
2 Grit Chamber Bypass Vault	TOW	6.98					0.02	0.52	1.02	2
3 Headworks- Grit Chamber	TOW	8.37								
4 Headworks Bar Screen	TOW	8.37								
5 Primary Pumping Station-Ground Floor	FF	6.62					0.38	0.88	1.38	1
6 Primary Clarifier - East	TOW	12.47								
7 Primary Clarifier - West	TOW	12.47								
8 Flow EQ Tank - No. 3	TOW	17.11								
9 Sludge Building - Ground Floor	FF	9.99								
10 Sludge Blend Tank	TOW	21.22								
11 Control Building - Ground Floor	FF	9.15								
12 Control Building Parking	Grade	5 to 6			1.09	1.00	2.00	2.50	3.00	5
13 Storage Shed	FF	8.13								
14 Flow EQ Tank - East	TOW	13.19								
15 Flow EQ Tank - West	TOW	13.15								
16 Anoxic Tank	TOW	17.12								
17 Anoxic Splitter Box	TOW	18.66								
18 Oxidic Tank	TOW	16.71								
19 Secondary Clarifier - East	TOW	13.67								
20 Secondary Clarifier - West	TOW	13.67								
21 Blower Building - Ground Floor	FF	7.18						0.32	0.82	1
22 Blower Building - Loading Dock	FF	11.10								
23 Filter Building - Ground Floor	FF	10.48								
24 Chlorine Contact Tank	TOW	7.20						0.30	0.80	3
25 Generator	Pad	7.54							0.46	1
26 Diesel Fuel Tank	Pad	7.64							0.36	1
27 Transformer	Pad	7.87							0.13	1
28 Plant Water Building	FF	7.68							0.32	4
29 Office Building	FF	9.50								
30 Compost Building	Grade	8.70								

TOW = Top of Wall Elevation
 FF = Finished Floor Elevation
 BFE=Base Flood Elevation-100 Year

At Risk

4.3 WWTF Planning Horizon

Wastewater facilities are normally designed to handle the maximum loading conditions expected to occur within a 20-year planning period. The 20-year planning period is recognized as a standard by both EPA and USDA, in addition to many other State and federal regulatory and funding agencies. Based upon the compliance schedule contained in Seaford's NPDES permit, construction of the WWTF upgrade/expansion shall be completed by January 31, 2023. For the purposes of sea level rise mitigation at the Seaford WWTF, a planning horizon of 30 years is recommended. This interval accommodates an extended planning period, since the start of operation of the expanded plant is still seven years into the future. Using a 30-year planning horizon, the expected sea level rise is roughly 0.45 meters, or 1.5 feet. Exhibit 2- 3 best represents the projected conditions of sea level rise combined with a 100-year flood for the 30-year planning scenario. The water surface elevation represented by the Exhibit 2-3 is Elevation 7.5 (NAVD88).

4.4 Mitigation Options

The City of Seaford plans to upgrade and expand the WWTF by 2023 in accordance with the NPDES compliance schedule. The plant will be integrated with state-of-the-art technologies for enhanced nutrient removal. It is expected that the upgrade project will include some new construction, along with renovation and repurposing of several of the existing tanks and buildings, while some of the older structures, having outlived their useful purpose, will be retired or demolished and replaced with new construction and new technology. Flood mitigation measures shall be incorporated into the WWTF upgrade design. Examples of mitigation actions may include site filling, elevating and relocation of equipment, floodproofing of structures, installation of check valves or tide gates, construction of floodwalls and other structural retrofits.

Using the recommended planning scenario of 1.5 feet of sea level rise combined with a 100-year flood, several existing WWTF assets are at risk and will require mitigation.

- Nanticoke Avenue – The grades along Nanticoke Avenue range from a low point of Elev. 4.07 to a high point of Elev. 9+. At its lowest point, the extent of flood inundation would be 3.5 feet under the planning level scenario. This street provides access to the Seaford WWTF and also serves as a public street. The street could be temporarily closed to traffic during flooding however this measure would restrict deliveries of essential chemicals and acceptance of leachate and septage. Alternatively, the street would need to be reconstructed at a higher elevation, i.e. raised.
- Grit Chamber Bypass Vault - The top of wall of the bypass vault is at Elev. 6.98, or 6.24 inches below the planning level BFE. The bypass vault contains a non-essential sluice gate however the structure is topped with an open grate which if flooded would overload the WWTF with flood waters. The bypass vault could be floodproofed simply through the installation of surround curbing, or by raising the walls and/or replacing the top grating with a waterproof cover.



- Primary Pumping Station – The finished floor (ground floor) of the primary pumping station is at Elev. 6.62, or 10 ½ inches below the planning level BFE. The primary pumping station is a multi-level building with two lower floors that house essential pieces of pumping equipment. The entry of flood waters into the ground floor level could eventually fill the lower levels and jeopardize the influent pumping operation.



There are four (4) pumps on the lowest level, three of which are dry pit pumps with extended shafts to electric motors located on the intermediate level. The fourth pump is newer and is a dry pit submersible pump which can operate under flooded conditions. A single pump alone, however, would not have adequate capacity to maintain the influent flow. Specific mitigation options include the installation of flood proof doors (3 locations), construction of a surrounding wall, placement of interior curbs to block water entry into the lower levels and/or replacement of the dry-pit pumps with submersible types. Alternatively, consideration should be given to the replacement of this structure considering its age and location.

- Control Building Parking Lot – The small parking lot in front of the Control Building ranges in grade from 5.0 to 5.9, or 2 – 2 ½ feet below the planning level BFE. The Control Building is substantially higher than the parking lot which would allow for the parking lot to be raised, regraded and repaved to a higher elevation. This work could be done concurrent with the road work on Nanticoke Avenue. Alternatively, the parking lot could simply be closed during flood events, with minimal consequence.



- Blower Building Ground Floor- The finished floor (ground floor) of the Blower Building is at Elev. 7.18, or 3.8 inches below the planning level BFE.



The Blower Building is a multi-level building with two upper floors that are not at risk. The lower level of the Blower Building houses the motor control centers for blowers and other essential process equipment. The motor control centers sit on a 4-inch high concrete pad, such they are elevated above the BFE but only by a fraction of an inch.



Even so, mitigation options should be considered such as the installation of flood proof doors (2 mandoor and 1 overhead door), construction of a surround wall or curb and/or elevation or relocation of the motor control centers.

- Chlorine Contact Tank – The top of wall of the chlorine contact tank is at Elev. 7.20, or 3.6 inches above the planning level BFE. It is likely that as part of the ENR upgrade the chlorination process will be discontinued and replaced with a more modern technology such as ultraviolet (UV) disinfection, in which case the contact tank would no longer be needed. If this were the case, the tank may be repurposed to hold post aeration equipment or as an effluent pumping station to allow for alternate methods of effluent disposal. In addition, the tank walls could be raised with structural concrete and the ground surrounding the tank could be raised with suitable fill material.



- Generator and Fuel Tank – The existing emergency generator sits on a concrete foundation pad at Elev. 7.54 which is ½” above the planning level BFE. The generator and fuel tank are essential equipment however they will likely be retired and replaced with larger units as part of the next WWTF upgrade. In this case, they could be relocated and/or raised to a higher elevation.



- Transformer – The electric transformer sits on a concrete pad at Elev. 7.87 which is 4.4 inches above the planning level BFE. Similar to the generator and fuel tank, the WWTF upgrade will likely dictate a larger transformer in which case it could be placed at a higher elevation.



- Plant Water Building - The finished floor elevation of this building is 7.68 which is 2.2 inches above the planning level BFE. The building houses non-essential equipment and stored items and the flood risk is minimal. This building is also referred to as the "Old" Chlorine Building.



In addition to the specific retrofits at each structure, consideration should be given to the import of borrow material for filling and regrading of the site in selected areas. Grades would need to be adjusted by 1½ feet at the most to raise the ground above the planning level base flood elevation. Filling along the banks would require shoreline protective measures along the riverbank, such as vegetative and bioengineered systems, rock rip rap or other structural measures.

5.0 CONCLUSION

The Seaford WWTF is vulnerable to the effects of sea level rise. Proactive planning efforts will be essential for continued reliable WWTF operations over the decades ahead. With the incorporation of flood mitigation measures, the Seaford WWTF can adapt and be resilient to a modest rise in sea level of up to 1.5 to 2.0 feet, which will extend its effectiveness into the next 30 years and beyond. Over the longer term, as evidence of sea level rise trends become solidified, it may be prudent to consider relocation of the WWTF as a viable option. However, for the near term, flood resilient modifications should be incorporated into the next planned WWTF upgrade.

APPENDICES

Exhibit 1-1: 0.5 M Sea Level Rise (35 Year Projection)
Exhibit 1-2: 1.0 M Sea Level Rise (60 Year Projection)
Exhibit 1-3: 1.5 M Sea Level Rise (85 Year projection)

Exhibit 2-1: 100 Year Floodplain (2015)
Exhibit 2-2: 100 Year Floodplain + 1.0 FT (20 Year Projection)
Exhibit 2-3: 100 Year Floodplain + 1.5 FT (30 Year Projection)
Exhibit 2-3: 100 Year Floodplain + 2.0 FT (40 Year Projection)
Exhibit 2-3: 100 Year Floodplain + 3.0 FT (55 Year Projection)

Seaford WWTP Vulnerability Study



Seaford WWTP Vulnerability Study



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Seaford WWTP Vulnerability Study



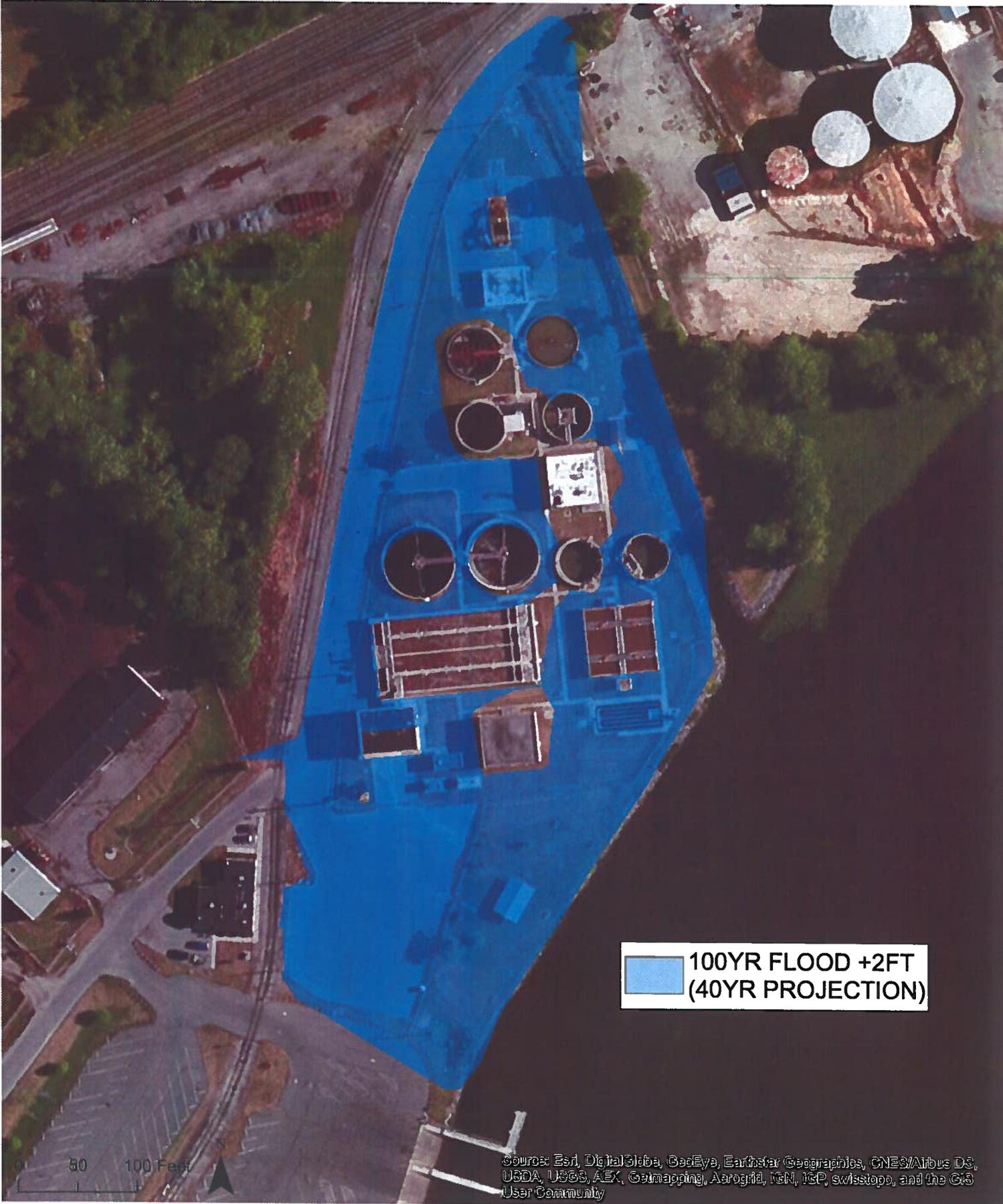
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