

## Application Details

## Contact Information

Status*:	Approved
Name*:	Hampton Roads Sanitation District - HRSD
Organization Type*:	Local Government
Tax ID*:	54-6001749
Unique Entity Identifier (UEI)*:	NLNKLTGGRKZ6
Organization Website:	<a href="https://www.hrsd.com">https://www.hrsd.com</a>

**Address\*:** 1434 Air Rail Avenue

Virginia Beach Virginia 23455-  
City State/Province Postal Code/Zip

**Phone\*:** (757) 460-2261 Ext.  
### ### #####

**Fax:** ### ### #####

**Benefactor:**

**Vendor ID:**

**Comments:**

## VCFPF Applicant Information

### Project Description

**Name of Local Government\*:** Hampton Roads Sanitation District

Your locality's CID number can be found at the following link: [Community Status Book Report](#)

**NFIP/DCR Community Identification Number (CID)\*:** 519999

If a state or federally recognized Indian tribe,

**Name of Tribe:**

**Authorized Individual\*:** Steve deMik  
First Name Last Name

**Mailing Address\*:** 1434 Air Rail Avenue  
Address Line 1  
Address Line 2

Virginia Beach Virginia 23455  
City State Zip Code

**Telephone Number\*:** 757-460-7240

**Cell Phone Number\*:** 757-274-5340

**Email\*:** [sdmik@hrsdc.com](mailto:sdmik@hrsdc.com)

Is the contact person different than the authorized individual?

**Contact Person\*:** Yes

**Contact:** Christina Condon  
First Name Last Name

1474 Air Rail Avenue  
Address Line 1  
Address Line 2

Virginia Beach Virginia 23455  
City State Zip Code

**Telephone Number:** 757-460-7015

**Cell Phone Number:** 757-510-6489

**Email Address:** [ccondon@hrsdc.com](mailto:ccondon@hrsdc.com)

Enter a description of the project for which you are applying to this funding opportunity

### Project Description\*:

Replace the Dozier's Corner Pump Station with a new pump station to a nearby location in the service area. The pump station serves 3,106 customers, both residential and commercial, by conveying sewage to the wastewater treatment facility. The existing pump station was built in 1960



and is at risk of flood damage. The new pump station will be built with the finished floor at 11 feet (versus the existing 7-foot elevation), and components will be upgraded to safely operate.

Low-income geographic area means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

Is the proposal in this application intended to benefit a low-income geographic area as defined above?

**Benefit a low-income geographic area\*:** Yes

Information regarding your census block(s) can be found at [census.gov](https://www.census.gov)

**Census Block(s) Where Project will Occur\*:** 5100340025

**Is Project Located in an NFIP Participating Community?\*** Yes

**Is Project Located in a Special Flood Hazard Area?\*** Yes

**Flood Zone(s) (if applicable):** AE

**Flood Insurance Rate Map Number(s) (if applicable):** 5100340025D

## Eligibility CFPF - Round 4 - Projects

### Eligibility

Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these)?

**Local Government\*:** Yes  
Yes - Eligible for consideration  
No - Not eligible for consideration

Does the local government have an approved resilience plan and has provided a copy or link to the plan with this application?

**Resilience Plan\*:** Yes  
Yes - Eligible for consideration under all categories  
No - Eligible for consideration for studies, capacity building, and planning only

If the applicant is not a town, city, or county, are letters of support from all affected local governments included in this application?

**Letters of Support\*:** Yes  
Yes - Eligible for consideration  
No - Not eligible for consideration  
N/A - Not applicable

Has this or any portion of this project been included in any application or program previously funded by the Department?

**Previously Funded\*:** No  
Yes - Not eligible for consideration  
No - Eligible for consideration

Has the applicant provided evidence of an ability to provide the required matching funds?

**Evidence of Match Funds\*:** Yes  
Yes - Eligible for consideration  
No - Not eligible for consideration  
N/A - Match not required

## Scoring Criteria for Flood Prevention and Protection Projects - Round 4

### Scoring

#### Category Scoring:

Hold CTRL to select multiple options

**Project Category\*:** All other projects

Is the project area socially vulnerable? (based on [ADAPT Virginia's Social Vulnerability Index Score](#))

**Social Vulnerability Scoring:**

Very High Social Vulnerability (More than 1.5)  
High Social Vulnerability (1.0 to 1.5)  
Moderate Social Vulnerability (0.0 to 1.0)  
Low Social Vulnerability (-1.0 to 0.0)  
Very Low Social Vulnerability (Less than -1.0)

**Socially Vulnerable\*:** Very High Social Vulnerability (More than 1.5)  
Is the proposed project part of an effort to join or remedy the community's probation or suspension from the NRP?

**NFIP\*:** No

Is the proposed project in a low-income geographic area as defined below?

"Low-income geographic area" means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

**Low-Income Geographic Area\*:** Yes

Projects eligible for funding may also reduce nutrient and sediment pollution to local waters and the Chesapeake Bay and assist the Commonwealth in achieving local and/or Chesapeake Bay TMDLs. Does the proposed project include implementation of one or more best management practices with a nitrogen, phosphorus, or sediment reduction efficiency established by the Virginia Department of Environmental Quality or the Chesapeake Bay Program Partnership in support of the Chesapeake Bay TMDL Phase III Watershed Implementation Plan?

**Reduction of Nutrient and Sediment Pollution\*:** Yes

Does this project provide ?community scale? benefits?

**Community Scale Benefits\*:** 50-100% of census block

Expected Lifespan of Project

**Expected Lifespan of Project\*:** Over 20 Years

**Comments:**

## Scope of Work - Projects - Round 4

### Scope of Work

Upload your Scope of Work

Please refer to Part IV, Section B. of the grant manual for guidance on how to create your scope of work

**Scope of Work\*:** [CID519999\\_HRSD\\_CFPF-2\\_SOWNarrative.pdf](#)

**Comments:**

The project is to relocate and reconstruct Dozier's Corner Pump Station in Chesapeake, VA. The current pump station experiences flood events, causing service disruptions that can negatively impact the surrounding community.

### Budget Narrative

**Budget Narrative Attachment\*:** [CID519999\\_HRSD\\_CFPF-2\\_BudgetNarrative.pdf](#)

**Comments:**

The total cost estimate for the pump station is \$7,965,258. HRSD requests \$6,265,669 with a 15% local match \$1,105,706.25, plus \$593,882.75 HRSD non-match share.

## Scope of Work Supporting Information - Projects

### Supporting Information - Projects

Provide population data for the local government in which the project is taking place

**Population\*:** 249422.00

Provide information on the flood risk of the project area, including whether the project is in a mapped floodplain, what flood zone it is in, and when it was last mapped. If the property or area around it has been flooded before, share information on the dates of past flood events and the amount of damage sustained

**Historic Flooding data and Hydrologic Studies\*:** [CID519999\\_HRSD\\_CFPF-2\\_FloodData.pdf](#)

Include studies, data, reports that demonstrate the proposed project minimizes flood vulnerabilities and does not create flooding or increased flooding (adverse impact) to other properties

**No Adverse Impact\*:** [CID519999\\_HRSD\\_CFPF-2\\_NoAdverseImpact-CFM.pdf](#)

Include supporting documents demonstrating the local government's ability to provide its share of the project costs. This must include an estimate of the total project cost, a description of the source of the funds being used, evidence of the local government's ability to pay for the project in full or quarterly prior to reimbursement, and a signed pledge agreement from each contributing organization

**Ability to Provide Share of Cost\*:** [CID519999\\_HRSD\\_CFPF-2\\_CostShare-CFOLetter.pdf](#)

A benefit-cost analysis must be submitted with the project application

**Benefit-Cost Analysis\*:** [CID519999\\_HRSD\\_CFPF-2\\_BCAREport.pdf](#)

Provide a list of repetitive loss and/or severe repetitive loss properties. Do not provide the addresses for the properties, but include an exact number of repetitive loss and/or severe repetitive loss structures within the project area

**Repetitive Loss and/or Severe Repetitive Loss Properties\*:** [CID519999\\_HRSD\\_CFPF-2\\_RepetitiveLoss.pdf](#)

Describe the residential and commercial structures impacted by this project, including how they contribute to the community such as historic, economic, or social value. Provide an exact number of residential structures and commercial structures in the project area

**Residential and/or Commercial Structures\*:**

The Dozier's Corner Pump Station serves 449 residential and commercial structures. For this proposed project, a residential structure may be purchased if it is the most suitable location for a new pump station, although HRSD is currently pursuing acquiring a property that is owned by the nearby Roosevelt Memorial Park Cemetery. The relocated and rebuilt pump station will contribute to the community's health, safety, and home values by reducing the risk of potential service disruption due to flooding. The disruptions in the current location could be temporary downtime of wastewater conveyance or the potential for overflow of wastewater entering the roadways and nearby streams.

If there are critical facilities/infrastructure within the project area, describe each facility

**Critical Facilities/Infrastructure\*:**

The Hampton Roads Sanitation District (HRSD) Dozier's Corner Pump Station is a critical facility within the project area. It provides public wastewater conveyance to the treatment plant. Wastewater treatment service is a critical community lifeline as defined by FEMA.

The current pump station is in an area subject to flooding, which leads to disruption to the conveyance, thereby increasing public health risks in the area. HRSD has been mandated by Federal Consent Decree from the EPA and Virginia DEQ to address the flooding issues at the pump station. The new pump station and components will mitigate these risks.

Within the project area, adjacent to the pump station is Newton Creek, a tributary of the Elizabeth River. Newton Creek passes through three culverts under an access road to the existing pump station. The culverts are critical infrastructure to carry high flow of stormwater. A site survey indicated that two of the three culverts are damaged and require replacement. Correcting these culverts is included in the project proposal.

Aside from the pump station and culverts, there are no other critical facilities identified within the project service area

Explain the local government's financial and staff resources. How many relevant staff members does the local government have? To what relevant software does the local government have access? What are the local government's capabilities?

**Financial and Staff Resources\*:**

HRSD was established in 1940 and has more than 80 years building and maintaining sustainable wastewater treatment infrastructure within the region. We have workforce expertise with approximately 900 highly skilled and trained employees to provide wastewater treatment, scientific, and ancillary services to 20 cities and counties in southeast and eastern Virginia. Additionally, we hire qualified consultants and contractors to assist with facilities design and construction.

HRSD has AA+ S&P and Fitch ratings and is highly capable of managing this project's budget. HRSD has received and successfully manages federal and state loans and grants as detailed in the Relationship to Other Projects section of this application. A copy of our annual comprehensive financial report is available at <https://www.hrsd.com/finance#annfinrpt>.

HRSD has teams ready and able to handle the financials, procurement, project management, engineering, operations, and technologies associated with this grant proposal. HRSD utilizes numerous software to achieve our mission within a framework of robust network communications, information security and technology systems. These include but are not limited to: Oracle E-Business including Enterprise Resource Planning for Finance, CIP budgeting, timekeeping, and more; and Oracle Utilities for the Customer Care and billing system; Hexagon CMMS for asset management; Enterprise project management systems, including Unifier for project management and contractor invoicing; Microsoft Office Suite, including SharePoint; GIS mapping systems; and specialized pretreatment and operations systems.

Identify and describe the goals and objectives of the project. Include a description of the expected results of the completed project and explain the expected benefits of the project. This may include financial benefits, increased awareness, decreased risk, etc.

**Goals and Objectives\*:**

Goals and objectives of the Dozier's Corner Pump Station project are:

1) Reduce wastewater system failures due to flood events, with the objectives of

a. replacing the pump station to a higher elevation with a durable structure that is flood-proofed to a minimum of 11 feet, designed to minimize

disruptions and withstand a 100-year flood event, and

b. for the pump station to function properly for 50 years and provide the critical service of conveying wastewater to the treatment plant for residents and businesses in the service area.

2) Reduce stormwater flood risk and decrease risks of safety hazards and excess nutrients entering the waterways by repairing culverts adjacent to the project site.

These goals and objectives will decrease the risks of service disruption and potential health and safety hazards resulting from flood events at the existing location. HRSD's integrated network of wastewater treatment assets and capabilities provide critical lifeline services that are used day-to-day to support the recurring needs of the community and enable other aspects of society to function. Ongoing operation of the pump station supports a thriving community.

The customers impacted will be notified and given opportunities to meet with HRSD regarding the construction. Communications will include the funding source, such as DCR's role if this project is selected for funding; and will bring awareness to the role of DCR and HRSD in the community. Outline a plan of action laying out the scope and detail of how the proposed work will be accomplished with a timeline identifying expected completion dates. Determine milestones for the project that will be used to track progress. Explain what deliverables can be expected at each milestone, and what the final project deliverables will be. Identify other project partners

**Approach, Milestones, and Deliverables\*:** [CID519999\\_HRSD\\_CFPF-2\\_Deliverables.pdf](#)

Where applicable, briefly describe the relationship between this project and other past, current, or future resilience projects. If the applicant has received or applied for any other grants or loans, please identify those projects, and, if applicable, describe any problems that arose with meeting the obligations of the grant and how the obligations of this project will be met

**Relationship to Other Projects\*:**

The proposed project is for a wastewater pump station design and construction. HRSD periodically reviews all pump stations for needed improvements to identify their risks and priorities. HRSD uses expert consultants, evaluation reports, analysis, and flood maps to determine its resilient building designs, and hires professional contractors to construct the pump stations. An example of previous a related project is the City Park Pump Station Replacement, which included acquisition of real property in Norfolk, VA. The project is currently under construction with a budget of \$1,976,826 and an estimated minimum life of 30 years. Increases in labor and materials and reduced contractor competition, has driven up the cost of building new pump stations in recent years.

HRSD has received prior federal and state grants listed below. To date, no material problems have occurred on any of the grants or loans, and HRSD has encountered no issues meeting the funding obligations. HRSD has systems in place and is prepared to accurately manage the requirements. Our Design and Construction team oversees projects to ensure contract compliance. The project manager and financial analyst ensure project milestones are met and reported, invoices reviewed for accuracy, and reimbursement requests submitted on time.

\* Congressionally Directed Spending FY24 appropriation \$1.25M for Chincoteague Treatment Plant. An FY25 application was submitted 3/21/24 and is pending approval.

\* VDCR - FHWA Recreational Trails Program 339N210, \$300,000 with \$75,000 match for Flax Mill Creek Trail. POP 12/6/21-12/31/24.

\* Virginia Department of Health / Fish & Wildlife. VDH-24-619-0017, \$57,700 for Boater Education and Pump-Out Program. POP 7/1/24-6/30/25. VHD/FWS grants have been awarded to HRSD annually since 1996.

\* Virginia Department of Environmental Quality, ARPA. Three awards ENRCPP-03, ENRCPP-04, and SCS-08, total \$72,001,566 plus HRSD share \$36,365,434.

\* Virginia Department of Environmental Quality, Water Quality Improvement Fund, two awards 440-S-22-02 and 440-S-23-04, total \$83,213,008, plus HRSD share \$27,737,670. 3 more WQIF applications were submitted, 2 have approved budgets pending funding, and 1 is under review.

\* EPA Water Infrastructure Finance Innovation Act Loans, total \$702,447,235 for Sustainable Water Initiative for Tomorrow projects.

\* Virginia Department of Environmental Quality, Clean Water Revolving Loan Fund, three active loans total \$106,163,013.

For ongoing projects or projects that will require future maintenance, such as infrastructure, flood warning and response systems, signs, websites, or flood risk applications, a maintenance, management, and monitoring plan for the projects must be provided

**Maintenance Plan\*:** [CID519999\\_HRSD\\_CFPF-2\\_MMMPlan.pdf](#)

Describe how the project meets each of the applicable scoring criteria contained in Appendix B. Documentation can be incorporated into the Scope of Work Narrative

**Criteria\*:**

Eligible Projects (10 of 30 points): The Dozier's Corner Pump Station project is categorized as an Other Project resulting in flood risk and pollution reduction and meets the eligible project criteria. It is critical community lifeline infrastructure.

Social Vulnerability Index Score (10 of 10 points): The proposed Dozier's Corner Pump Station is in Census block 515502209031 which has a Very High Social Vulnerability Index. This pump station provides critical services for multiple Census blocks with an average Social Vulnerability Index Score of 1.61. A map of the service area with Census blocks can be found in the Supporting Documentation section of the application, 1) Detailed map of the project area, "Dozier's Corner Service Area" and 2) Social vulnerability index score for the project area, "Social Vulnerability" map.

Community scale of benefits (30 of 30 points): Completion of the Dozier's Corner Pump Station will have a positive community benefit to three

Census block groups by providing wastewater conveyance and protecting the communities from operational failure during flood events that could lead to overflow and public health risks. The project scope includes culvert replacements that will protect the project area and nearby waterways from excess nutrients due to stormwater overflow and alleviate localized flooding. While the service area includes parts of five census blocks, residents are only located in 3 of the 5 Census blocks.

Expected lifespan of the project (10 of 10 points): The constructed pump station is expected to be operational and in use for 50 years or more.

Remedy for NFIP probation or suspension (0 of 5 points): Not applicable.

Proposed project part of a low-income geographic area (10 of 10 points): Yes, this project is in a low-income geographic area, as exhibited in the Supporting Documentation section of the application, Other Relevant Attachments, "Low-Income Data" map.

Proposed project implements a Chesapeake Bay TMDL BMP (5 of 5 points): Construction of the pump station will include stream improvements, conserve open space, and the appropriate erosion and sediment control measures for all disturbed area in accordance with Chesapeake Bay TMDL BMPs and the Virginia Erosion and Sedimentation Control Handbook.

## Budget

### Budget Summary

Grant Matching Requirement*:	LOW INCOME - All other Projects Fund 85%/Match 15%
Is a match waiver being requested?	
Match Waiver Request	No
Note: only low-income communities are eligible for a match waiver.	
*:	
I certify that my project is in a low-income geographic area:	Yes
Total Project Amount (Request + Match)*:	\$7,371,375.00
	**This amount should equal the sum of your request and match figures
REQUIRED Match Percentage Amount:	\$1,105,706.25

### BUDGET TOTALS

Before submitting your application be sure that you meet the match requirements for your project type.

Match Percentage:	0.00%
	Verify that your match percentage matches your required match percentage amount above.
Total Requested Fund Amount:	\$6,265,669.00
Total Match Amount:	\$1,105,706.25
TOTAL:	\$7,371,375.25

### Personnel

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

### Fringe Benefits

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

### Travel

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

#### Equipment

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

#### Supplies

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

#### Construction

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

#### Contracts

Description	Requested Fund Amount	Match Amount	Match Source
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Pre-Construction	\$40,828.00	\$0.00	In kind
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Construction	\$6,224,841.00	\$0.00	In kind
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	<b>\$6,265,669.00</b>	<b>\$0.00</b>	
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#### Maintenance Costs

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

#### PreAward and Startup Costs

Description	Requested Fund Amount	Match Amount	Match Source
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Preliminary Engineering Report	\$0.00	\$196,495.00	Cash
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Design	\$0.00	\$909,211.25	Cash
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		<b>\$1,105,706.25</b>	
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#### Other Direct Costs

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

## Long and Short Term Loan Budget - Projects - VCFPF

#### Budget Summary

Are you applying for a short term, long term, or no loan as part of your application?

If you are not applying for a loan, select "not applying for loan" and leave all other fields on this screen blank

**Long or Short Term\*:** Long-Term Loan

Total Project Amount:	\$7,371,375.00
Total Requested Fund Amount:	\$7,371,375.00
TOTAL:	\$7,371,375.00

Salaries

Description	Requested Fund Amount
No Data for Table	

Fringe Benefits

Description	Requested Fund Amount
No Data for Table	

Travel

Description	Requested Fund Amount
No Data for Table	

Equipment

Description	Requested Fund Amount
No Data for Table	

Supplies

Description	Requested Fund Amount
No Data for Table	

Construction

Description	Requested Fund Amount
No Data for Table	

Contracts

Description	Requested Fund Amount
Construction Contract	\$6,224,841.00
Pre-Construction Contract	\$40,828.00
Preliminary Engineering Report	\$196,495.00
Design	\$909,211.00
	<b>\$7,371,375.00</b>

Other Direct Costs

Description	Requested Fund Amount
No Data for Table	

Supporting Documentation



## Supporting Documentation

Named Attachment	Required	Description	File Name	Type	Size	Upload Date
Detailed map of the project area(s) (Projects/Studies)		CID519999_HRSD_CFPF-2_Maps_ProjectArea.pdf contains 2 maps. The 1st is a detailed map of the service area and HRSD assets. The 2nd is an aerial view of the project construction area.	<a href="#">CID519999_HRSD_CFPF-2_Maps_ProjectArea.pdf</a>	pdf	936 KB	11/27/2024 11:31 AM
FIRMette of the project area(s) (Projects/Studies)		CID519999_HRSD_CFPF-2_FIRMETTE.pdf is the FEMA FIRMette with the Dozier's Corner Pump Station's approximate project location pinned.	<a href="#">CID519999_HRSD_CFPF-2_FIRMETTE.pdf</a>	pdf	776 KB	11/26/2024 12:33 PM
Historic flood damage data and/or images (Projects/Studies)		CID519999_HRSD_CFPF-2_FloodImages-Study contains photos from two recent flood events at the Dozier's Corner Pump Station.	<a href="#">CID519999_HRSD_CFPF-2_FloodImages.pdf</a>	pdf	155 KB	11/27/2024 11:56 AM
A link to or a copy of the current floodplain ordinance		CID519999_HRSD_CFPF-2_FloodplainOrdinance.pdf contains a cover sheet and a copy of the City of Chesapeake's floodplain ordinance.	<a href="#">CID519999_HRSD_CFPF-2_FloodplainOrdinance.pdf</a>	pdf	1001 KB	11/27/2024 11:11 AM
Maintenance and management plan for project		CID519999_HRSD_CFPF-2_MMPlan contains a cover sheet and the HRSD Maintenance Plan for pump stations, which includes the monitoring and management of pump stations.	<a href="#">CID519999_HRSD_CFPF-2_MMPlan.pdf</a>	pdf	1 MB	11/27/2024 10:52 AM
A link to or a copy of the current hazard mitigation plan		CID519999_HRSD_CFPF-2_Support_HMP contains a cover sheet with links to the regional Hampton Road Planning District Commission Hazard Mitigation Plan (HMP) and a copy of the FEMA letter approving the HRSD amendment to the HRPDC HMP.	<a href="#">CID519999_HRSD_CFPF-2_Support_HMP.pdf</a>	pdf	1 MB	11/27/2024 11:18 AM
A link to or a copy of the current comprehensive plan		The attached CID519999_HRSD_CFPF-2_Support_CompPlan.pdf provides the link to the City of Chesapeake's Comprehensive Plan.	<a href="#">CID519999_HRSD_CFPF-2_Support_CompPlan.pdf</a>	pdf	92 KB	11/27/2024 10:59 AM
Social vulnerability index score(s) for the project area		CID519999_HRSD_CFPF-2_Maps_SV_LowIncome contains two maps. 1. Dozier's Corner Pump Station project area Census Blocks Social Vulnerability Index (SVI) scores. 2. Income data for the two Census Tracts in the Dozier's Corner Pump Station project area.	<a href="#">CID519999_HRSD_CFPF-2_Maps_SV_LowIncome.pdf</a>	pdf	510 KB	11/27/2024 11:45 AM
Authorization to request funding from the Fund from governing body or chief executive of the local government		CID519999_HRSD_CFPF-2_Support_Authorization.pdf contains a cover sheet and meeting minutes from the HRSD Commission approving the project and estimated budget.	<a href="#">CID519999_HRSD_CFPF-2_Support_Authorization.pdf</a>	pdf	932 KB	11/27/2024 10:58 AM
Signed pledge agreement from each contributing organization		The attached CID519999_HRSD_CFPF-2_Support_Pledge.pdf contains a cover sheet and letter from HRSD Chief Financial Officer committing to financial support for the project. There are no other organizations financially contributing to this project.	<a href="#">CID519999_HRSD_CFPF-2_Support_Pledge.pdf</a>	pdf	693 KB	11/26/2024 02:02 PM
Maintenance Plan		The Maintenance Plan for pump stations is attached in a separate document, CID519999_HRSD_CFPF-2_MMPlan, in the Supporting Documentation under "Maintenance and management plan for the project."	<a href="#">CID519999_HRSD_CFPF-2_Support_MaintenancePlan.pdf</a>	pdf	54 KB	11/27/2024 10:48 AM
<i>Benefit-cost analysis must be submitted with project applications over \$2,000,000. in lieu of using the FEMA benefit-cost analysis tool, applicants may submit a narrative to describe in detail the cost benefits and value. The narrative must explicitly indicate the risk reduction benefits of a flood mitigation project and compares those benefits to its cost-effectiveness.</i>						
Benefit Cost Analysis		CID519999_HRSD_CFPF-2_BCAREport.pdf contains a cover page and the 7-page Benefit-Cost Analysis for the Dozier's Corner Pump Station Replacement project.	<a href="#">CID519999_HRSD_CFPF-2_BCAREport.pdf</a>	pdf	1 MB	11/26/2024 04:19 PM
Other Relevant Attachments		The CID519999_HRSD_CFPF-2_Support_Alternatives.pdf is a Gannett-Fleming presentation of their alternatives analysis for the Dozier's Corner Pump Station Replacement, Capital Improvement Project AT015400. This is also detailed in the Scope of Work document.	<a href="#">CID519999_HRSD_CFPF-2_Support_Alternatives.pdf</a>	pdf	11 MB	11/26/2024 04:17 PM

## Letters of Support



Description	File Name	Type	Size	Upload Date
Attached is a letter of support from the City of Chesapeake	<a href="#">CID519999_HRSD_CFPF-2_LOS_Chesapeake.pdf</a>	pdf	159 KB	11/26/2024 04:45 PM

## Resilience Plan

*Resilience Plan*

Description	File Name	Type	Size	Upload Date
CID519999_HRSD_CFPF-2_ResiliencePlan contains a cover sheet and 3-page letter from DCR approving the HRSD Resilience Plan.	<a href="#">CID519999_HRSD_CFPF-2_ResiliencePlan.pdf</a>	pdf	242 KB	12/04/2024 01:26 PM

## Dozier's Corner Pump Station Scope of Work

The Dozier's Corner Pump Station (PS) is located in Roosevelt Memorial Park in Chesapeake, Virginia, and serves approximately 1 square mile and includes residential, commercial, and industrial users. Constructed in 1961, the PS is nearing the end of its useful life. In addition to the advanced age of this critical facility, the PS was constructed with a finished floor elevation of 5.48 feet and has experienced several flood events, shown in Figures 1 and 2.

The service area for the PS can be found in the Project Area map, uploaded as a supporting document. The PS serves two census tracts, which have median household incomes of \$77,321 and \$61,179. The average of these median household incomes, \$69,250, is 77% of the state median household income of \$89,931. Roughly 5,300 residents live within these two census tracts, and 3,106 are serviced by the PS. Approximately two-thirds of the customers serviced by the PS are located in the low-income census tract. The two census tracts are comprised of three census block groups, as seen in the Social Vulnerability map in the supporting documents. These three census block groups are classified as having very high and high social vulnerability, and an average SVI Index of 1.61. The PS provides service to 449 structures within the service area. Within the two census tracts served by the PS, 18 structures are considered repetitive loss, and one structure is considered severe repetitive loss.

These flood events cause disruption to service and are potential risks to the communities in this service area. Without a pump station, wastewater cannot be conveyed to treatment plants and spills into roadways and waterways leading to public health and safety problems due to a high likelihood of exposure to fecal bacteria and hazards to the traveling



***Figure 1: Flooding observed at Dozier's Corner Pump Station during Super Storm Sandy on October 29, 2012.***

public. Construction of the PS will include stream improvements, conserved open space, and the appropriate erosion and sediment control measures for all disturbed area in accordance with Chesapeake Bay TMDL BMPs and the Virginia Erosion and Sedimentation Control Handbook. HRSD has been mandated by Federal Consent Decree from the Environmental Protection Agency and Virginia Department of Environmental Quality to address the flooding issues at the

PS and, subsequently, this facility was identified in HRSD's Rehabilitation Action Plan as a material risk of failure for flooding. This mitigation and the associated asset renewal will ensure sanitary sewage from this area is reliably conveyed from the local collection system to the treatment facility for decades to come.

To decrease the risk of flood damage, service disruption, and negative environmental impacts, this project will rebuild and elevate or otherwise protect the aging PS to a finished floor of 11 feet and will upgrade components to safely operate and continue to provide wastewater pumping services in the surrounding community. In addition to the resilient design and construction of the new PS, HRSD will address flooding in the adjacent Newton Creek, a tributary of the Elizabeth River. HRSD has reported frequent flooding at the site, where water swells up from the creek and flows across the access road. At this location, Newton Creek passes through three culverts under the access road to the existing pump station. During large storm events, stormwater backs up and overtops the access road that leads to the PS. While reports initially indicated that the culverts may become blocked and/or are insufficiently sized to carry the high flow of stormwater, the site survey indicated that two of the three culverts under this road are crushed/damaged and require replacement. Gannett Fleming, Inc. (GF) will include stream crossing improvements as part of project design and estimated construction cost. The site is within a FEMA Special Flood Hazard Area and is within the effective 100-year floodplain, Zone AE.



***Figure 2: Flooding observed at Dozier's Corner Pump Station on December 17, 2023.***

### **Alternative Analysis**

The surrounding area cannot go without a pump station. If the project is not completed, future repairs to critical assets and temporary operations costs due to future damages would significantly exceed the cost of the project. The financial cost of damages would be borne by all HRSD ratepayers, including those who are economically distressed. Furthermore, even when immediate repairs are made, the aging infrastructure becomes a deferred expense that will eventually be shouldered by the same ratepayers. Environmental and public health concerns stemming from sanitary sewer overflows are also likely to manifest in the areas immediately adjacent to the PS and surrounding waterways. The proposed project represents a substantial investment in the future of the community by addressing both flood risk and aging infrastructure concerns. In addition,

HRSD is regulatorily required to address the flooding concerns at the pump station and replace the station pumps.

A total of 19 locations were explored as potential sites for the new PS, including reusing the existing PS site, using the cemetery laydown area in Roosevelt Memorial Park Cemetery, using the right of way of Campostella Road, using a portion of one of four church properties to the east of the existing site, or acquiring a residential property on Burns Street.

Evaluations of alternatives were made using an approach that addressed social, environmental, and economic objectives. The final alternatives selected as most suitable for the pump station were as follows:

- Location A: The existing PS Site.
- Location B: Area 40 ft to the north-northeast of the existing PS, in a current cemetery storage area
- Location C: Area 700 ft northeast of the existing PS, in a current cemetery storage and laydown area.

#### Location A – Existing Dozier’s Corner Pump Station Site

The existing pump station is located at 1109 Keats Street, Chesapeake, Virginia, and is owned by HRSD. The existing bypass pump is currently located partly on cemetery property and approximately 2,300 square feet of additional space will be necessary for construction of a new pump station in the same location, thus some additional property will need to be acquired. The pump station is bordered by the Roosevelt Memorial Park cemetery to the east and south, with residential properties directly across the street to the northwest. This alternative will have limited access to staging during construction and will require a complete bypass of the pump station through both the demolition of the existing station and construction of the new station. Connection to the existing gravity sewer and force mains may require replacement of a short section of the existing pipes due to aging infrastructure. The existing site is at an elevation of approximately 4.5 feet above sea level and experiences flooding during significant rain events. Access improvements, including stream crossing modification, will be required for this alternative. Further, the limited space on the existing parcel creates expensive obstacles. Significant bypass pumping drives high project costs, the low elevation requires more material and effort to construct a new design above the 100-year floodplain, and the schedule may be elongated due to the sequence of construction required. As this project has an EPA regulatory deadline of May 2027, the expected extension in schedule may conflict with the desired completion date.

This alternative may impact the cemetery staff and visitors due to construction on cemetery property but is not expected to impact the public or the nearby neighborhood.

With construction equipment entering and exiting the site through Campostella Road and Keats Street, these areas of the neighborhood may be impacted by the localized increase in traffic. However, public access road shutdowns and detours are not anticipated and further traffic disruption in the area is unlikely. Permitting requirements for this alternative are not expected to deviate from those listed in the PER. During the final design and construction phases, the following permits are anticipated to be obtained by HRSD as the owner: Conditional Use Permit, Erosion and Sediment Control Plan, City of Chesapeake Stormwater Permit, Commercial Land Disturbing Permit, Chesapeake Bay Preservation Area (CBPA) Application, Standard Joint Permit Application (JPA), Certificate to Construct (CTC), and Certificate to Operate (CTO). Wetland delineation will need to be performed in the design phase to verify requirements of the JPA process. Contractor-obtained permits anticipated during the construction phase of the program include the Chesapeake Construction General Permit (GCP), Commercial Right-of-Way Permit, building permit, and demolition permit. The construction cost associated with the design at this location is estimated at \$6,550,000 based on modifications to the PER phase Class 5 cost estimate. AACE International defines Class 5 as project definition between 0% and 2% with expected accuracy range of -50% under and +100% above calculated cost. This estimate does not include the cost of cemetery property acquisition, though the additional space required is not expected to significantly increase the total estimate.

#### Location B – Cemetery Storage Area behind Existing PS

This option is located at 1101 Campostella Road, Chesapeake, Virginia and is owned by the cemetery, Roosevelt Memorial Park. Approximately 4,600 square feet of property acquisition is required for this option. The site is adjacent to the existing PS site and the cemetery maintenance yard with residential properties directly across the street to the northwest. Close proximity to the current station would allow the PS to stay in service during construction, requiring minimal bypass pumping for final connection at the end of construction. Connection to the existing gravity sewer and force mains would require the shortest extension of existing pipe and may require replacement of a short section of the existing pipes due to aging infrastructure. At a higher grade of elevation than the existing site, approximately 6 feet above sea level, purchase of this property would mitigate current flooding issues. Access improvements, including stream crossing modifications, will be required for this option. However, construction access through Halstead Road provides adequate space for construction equipment and stability with no additional improvements necessary. While this alternative provides adequate space and elevation at a lower property acquisition cost, it would require the relocation of existing portable storage facilities and resources currently in use by the cemetery on the site. This may slightly delay

the construction schedule; however, the property owner has been receptive to this solution under the condition that the cemetery is reimbursed for this minor relocation of assets. As this project has an EPA regulatory deadline of May 2027, a slight delay in schedule may conflict with the desired completion date.

This alternative may impact the cemetery staff and visitors due to construction on cemetery property but is not expected to impact the public or the nearby neighborhood. With construction equipment entering and exiting the site through Campostella Road and Keats Street, these areas of the neighborhood may be impacted by the localized increase in traffic. However, public access road shutdowns and detours are not anticipated and further traffic disruption in the area is unlikely. Permitting requirements for this alternative are not expected to deviate from those listed in the PER. During the final design and construction phases, the following permits are anticipated to be obtained by HRSD as the owner: Conditional Use Permit, Erosion and Sediment Control Plan, City of Chesapeake Stormwater Permit, Commercial Land Disturbing Permit, Chesapeake Bay Preservation Area (CBPA) Application, Standard Joint Permit Application (JPA), Certificate to Construct (CTC), and Certificate to Operate (CTO). Wetland delineation will need to be performed in the design phase to verify requirements of the JPA process. Contractor-obtained permits anticipated during the construction phase of the program include the Chesapeake Construction General Permit (GCP), Commercial Right-of-Way Permit, building permit, and demolition permit. The construction cost associated with the design at this location is estimated at \$6,200,000 based on modifications to the PER phase Class 5 cost estimate. AACE International defines Class 5 as project definition between 0% and 2% with expected accuracy range of -50% under and +100% above calculated cost. This estimate does not include the cost of cemetery property acquisition, though this space is expected to increase the total estimate to some degree.

#### Location C – Cemetery Storage and Laydown Area

This option is located at 500 Oneal Lane, Chesapeake, Virginia and is owned by the cemetery, Roosevelt Memorial Park. Approximately 4,600 square feet of property acquisition is required for this option. The site is approximately 700 feet from the existing PS site with residential properties to the west and Martin Luther King Jr. Memorial Highway (I-464) to the north-northeast. The location would allow for the PS to stay in service during construction, requiring a shorter length of bypass pumping for final connection at the end of construction. Connection to the existing gravity sewer and force mains would require a major extension of the existing pipes and may require replacement of a short section of the existing pipes due to aging infrastructure. At a higher grade of elevation than the existing site, approximately 12 feet above sea level, purchase of this property would mitigate

current flooding issues. Major access improvements may be required to reach this site through Oneal Lane, and stream crossing modifications will also be required for this alternative. While this alternative provides adequate space and elevation at a lower property acquisition cost, it would require very deep gravity sewer and difficult or expensive access improvements that may delay the construction schedule. As this project has an EPA regulatory deadline of May 2027, the expected extension in schedule may conflict with the desired completion date.

This alternative may impact the cemetery staff and visitors due to construction on cemetery property but is not expected to impact the public or the nearby neighborhood. With construction equipment entering and exiting the site through Campostella Road and Keats Street, these areas of the neighborhood may be impacted by the localized increase in traffic. However, public access road shutdowns and detours are not anticipated and further traffic disruption in the area is unlikely. Permitting requirements for this alternative are not expected to deviate from those listed in the PER. During the final design and construction phases, the following permits are anticipated to be obtained by HRSD as the owner: Conditional Use Permit, Erosion and Sediment Control Plan, City of Chesapeake Stormwater Permit, Commercial Land Disturbing Permit, Chesapeake Bay Preservation Area (CBPA) Application, Standard Joint Permit Application (JPA), Certificate to Construct (CTC), and Certificate to Operate (CTO). Wetland delineation will need to be performed in the design phase to verify requirements of the JPA process. Contractor-obtained permits anticipated during the construction phase of the program include the Chesapeake Construction General Permit (GCP), Commercial Right-of-Way Permit, building permit, and demolition permit. The construction cost associated with the design at this location was estimated at \$7,050,000 based on modifications to the PER phase Class 5 cost estimate. AACE International defines Class 5 as project definition between 0% and 2% with expected accuracy range of -50% under and +100% above calculated cost. This estimate does not include the cost of cemetery property acquisition, though this space is expected to significantly increase the total estimate.

#### Alternative Analysis and Site Selection

A matrix of the alternatives can be found in Table 1 to provide a direct comparison of cost between the three locations. The breakdown below reflects the most influential factors to the property decision-making process for this project, encompassing the real costs required for each site. Criteria such as permitting, maintenance of traffic, and community impacts were not included in the following matrix as they were deemed sufficiently mitigated. Ranking as the most preferred option, Location B provides the highest value option for the PS replacement site.



<b>Table 1: Construction Estimate Breakdown</b>			
<b>Description</b>	<b>Location A</b>	<b>Location B</b>	<b>Location C</b>
General Requirements and Site Work	\$ 1,300,000	\$ 1,300,000	\$ 1,300,000
Pump Station Construction	\$ 700,000	\$ 600,000	\$ 600,000
Materials and Equipment	\$ 650,000	\$ 550,000	\$ 550,000
Installation of Piping, Plumbing, HVAC, Electrical, and I&C	\$ 950,000	\$ 900,000	\$ 1,550,000
General Conditions, Contingency, and Escalation	\$ 2,950,000	\$ 2,850,000	\$ 3,050,000
<b>Total Construction Cost</b>	<b>\$6,550,000</b>	<b>\$6,200,000</b>	<b>\$7,050,000</b>

With the lowest overall cost, estimated at \$6,200,000, Location B provides the most cost-effective and least disruptive option with minimal impact to schedule, stakeholders, and the surrounding community for the Dozier's Corner PS replacement. Additionally, the recommended site elevation is approximately 6 feet above sea level, resolving design issues within the flood zone and with close proximity to the existing station minimal bypass pumping will be required and therefore dramatically reduce expected project costs. Moreover, this option mitigates the access issues to provide adequate space for construction staging.

## Goals and Objectives

1. Goal 1: Reduce wastewater system failures due to flooding which result in wastewater spilling into roadways and waterways leading to public health and safety issues.
  - a. Objective: Replace the existing PS in accordance with HRSD's Rehabilitation Action Plan and the EPA's Federal Consent Decree by May 2027. Specific timebound tasks include:
    - i. Complete project design by July 2025.
    - ii. Acquire the property where the new PS will be located by July 2025.
    - iii. Successful procurement of a construction contractor within 60 days of design completion.
    - iv. Complete project construction by May 2027.
2. Goal 2: Perform improvements to Newton Creek crossing culverts to reduce the flood risk to the surrounding area during project design.
  - a. Objective: GF to include stream crossing improvements as part of project design, to be completed by June 2025. No analysis will be required for compliance due to the proposed replacement and upgrade to 42" pipes.



## Work Plan

The proposed completion schedule can be found in Table 2 below. The regulatory deadline for completion of this project is May 2027. HRSD is working with GF to develop project design and to perform pre-construction bid activities. A contractor will be procured to complete construction activities.

**Table 2: Preliminary Construction Schedule**

<b><u>Milestone</u></b>	<b><u>Start Date</u></b>	<b><u>End Date</u></b>
Preliminary Engineering	January 2024	May 2024
Design	October 2024	June 2025
Project Design	October 2024	June 2025
Regulatory Approvals, Utilities, and Public Outreach	October 2024	June 2025
Bidding	June 2025	August 2025
Construction	August 2025	May 2027

HRSD is primarily responsible for the completion of the project. However, they will rely on contract support throughout the project. Gannett Fleming is responsible for the completion of the PER, project design, and relevant permit applications to regulatory stakeholders. They will support HRSD in the pre-construction bid phase by developing the bid documents, attending relevant bid meetings, performing bid analysis, and preparing Conformed Documents. HRSD will select a contractor to perform the construction, and the selected contractor will be responsible for adhering to the project design developed by GF and completing specific construction tasks on budget and in a timely manner.

Following the completion of the project, ownership of the property and facility may be transferred to the City of Chesapeake. Chesapeake would be responsible for the maintenance of the project over its lifespan. A Letter of Support from the City of Chesapeake has been submitted as a supporting document. The Letter highlights the partnership between HRSD and Chesapeake and underlines the importance of the project. Chesapeake would maintain the facility in accordance with the HRSD Maintenance Manual (Manual), also attached as a supporting document. The Manual outlines the relevant activities required to prolong the life of the facility, including general maintenance procedures and part specific maintenance procedures to be performed on a regular basis outlined on Form 5-14, which can be found on page 76 of the Manual.

## Evaluation

Success indicators throughout the project will be measured against the schedule outlined in Table 2. Due to the EPA regulatory deadline of May 2027, timely completion of the project is the primary indicator of success, and HRSD will closely monitor the progress of both GF and the procured construction contractor to ensure that the project meets the requirement of the agreement and is delivered on time. The potential for project delays is acknowledged and communicated through development of a risk register which serves to anticipate risks and mitigate their effect.

Reduction of recurring localized flooding in the project area will also be an indicator of success. The upgraded size of the replacement triple culverts under the access road which crosses Newton Creek will restore access to the facility during severe weather events, driving this metric of success.

Once the new PS has been completed, the surrounding residents and environment will reap the ultimate indicators of success: the reduction of service outages due to flooding that result in public health and safety and negative environmental impacts to the surrounding waterways due to the increased likelihood of exposure to fecal bacteria during a service disruption. Additionally, the community will benefit from investment in the renewal of aging infrastructure.

## Benefit Cost Analysis

A Benefit Cost Analysis (BCA) was performed using FEMA's BCA Toolkit. The Project Report is included as part of this submission package. HRSD is happy to provide the supporting documentation referenced in the BCA upon request.

The Benefit Cost Ratio (BCR) for Dozier's Corner Pump Station is 1.32. This project was previously submitted to FEMA's BRIC program and was not selected for funding. Feedback from FEMA regarding the BCA was incorporated into the updated calculation. During FEMA's reanalysis of the BCA, they opted to manually include a value for social benefits to increase the BCR. Social benefits have not been included in the redeveloped BCA for this submission due to the selection of the "Utilities" property type, limiting HRSD's ability to input any social benefits. However, the inclusion of social benefits, mental health and anxiety, which is valued at \$2,443 per person, would increase project benefits by \$7,587,958, bringing the BCR up to 2.2. The calculations used to determine the alternative BCR are as follows: the social benefits were added with the initial benefits and the sum of those values was divided by the costs. Specific figures are included below:

$$(\$11,158,449 + \$7,587,958) / \$8,437,638 = 2.2$$

HRSD will monitor the progress made by both Gannett Fleming and the procured construction contractor to ensure that the cost and timely implementation of the proposed project does not unnecessarily impact the cost effectiveness of the project.

## Scoring Criteria

<b>Table 3: Projected Project Scoring</b>	
<b>Category</b>	<b>Dozier's Corner Pump Station</b>
Eligible Project Type	Other Project (Flood Risk and Pollution Reduction)
Social Vulnerability Index Score	$(1.91 + 1.07 + 1.85) / 3 = 1.61$
Community Scale of Benefits	More Than One Census Block
Expected Lifespan of Project	Over 20 Years
Remedy for NFIP Probation or Suspension	No
Low-Income Geographic Area	Yes
Chesapeake Bay TMDL BMP	Yes

## Budget Narrative

Applicant	Hampton Roads Sanitation District (HRSD)
Project Name	Dozier's Corner Pump Station Replacement
Period of Performance	January 1, 2025, through December 30, 2028
Total State Funding Request	\$6,265,669.00
HRSD Match 15%	\$1,105,706.25
Grant Application Total	\$7,371,375.25
HRSD Non-Match Share	\$593,882.75
Project Grand Total	\$7,965,258.25

The Dozier's Corner Pump Station will be relocated to a new location due to flooding in the area. HRSD is targeting a site adjacent to the existing pump station on land to be obtained from the Roosevelt Memorial Park Cemetery. The current location has experienced several water intrusion events. The new pump station will be elevated and flood-proofed to a minimum of 11 feet, which is 3 feet above the Base Flood Elevation (BFE) of 8.0 feet and in compliance with the City of Chesapeake Code of Ordinances' requirement of a freeboard of 1.5 feet above BFE.

The total cost estimate for Dozier's Corner Pump Station is \$7,965,258. HRSD is requesting a grant award of \$6,265,669 which will be applied to pre-construction and construction-related contract costs. However, should the requested grant award be unavailable due to other grant awards to HRSD or the general availability of grant funds, HRSD is interested in a VDCR Long-Term Loan as described in the Round 5 – Community Flood Protection Fund Manual.

Pre-construction costs are estimated to be \$40,828. Construction costs for the project are estimated to be \$6,224,841, including the contingency and escalation costs detailed below. The remaining \$1,699,589 to complete the project are included in the explanation of costs below and will be, or have already been, paid by HRSD.

HRSD is requesting that certain pre-award costs be approved and considered as a portion of the local share. HRSD's \$1,699,589 share, including HRSD's match of \$1,105,706.25, consists of the following activities: Preliminary Engineering Report (PER), Design, and Property Acquisition. The PER, which was developed by the engineering consulting firm Gannett Fleming, Inc. (GF) in mid-2024, incurred a cost of \$196,495. Design has begun prior to the submission of the application and will result in a total cost of \$913,094. The estimated cost to acquire the identified property for the new Pump Station is \$590,000. HRSD has reached out to the Cemetery regarding the property, and the transaction will likely occur prior to the start of the Period of Performance (POP). These costs have been adequately documented and are/were necessary and reasonable to successfully implement the project. Thus, HRSD is kindly requesting that these costs be considered eligible pre-award costs to count towards the local cash match. Additionally, the approval of these pre-award costs would ensure that HRSD is able

to begin activities within nine-months post award, eliminating the risk of funding withdrawal in the event of an unforeseen delay.

As noted in the Scope of Work narrative, Dozier's Corner Pump Station services two census tracts which collectively have a median household income of \$69,250. As 80% of the state median household income is \$71,945, HRSD is requesting an 85%/15% low-income geographic area match rate. Thus, should the pre-award costs be approved, \$1,105,706.25 of HRSD's \$1,699,589 local share would constitute HRSD's local cash match and the remaining \$593,882.75 would be considered a local non-match share.

Cost estimates were prepared by GF. The engineering services for this project will be completed by GF under the HRSD General Engineering Services annual services contract. HRSD anticipates this station will have complete design by June 2025, bid within 60 days after the grant award, and completed by May 2027.

1. Preliminary Engineering Report (PER) \$196,495: Pre-award cost for GF to evaluate the project alternatives and develop cost estimates. HRSD is not pursuing VCFPF funding for this line item but is seeking DCR approval for the PER to be considered an eligible pre-award cost.
2. Design and Pre-Construction \$953,922: Both design and pre-construction procurement activities are under the same Professional Services Agreement with GF.
  - a. Design \$913,094: Includes site visits and field investigations, preparation of plans and specifications, preparation of probable construction cost and schedule, regulatory approvals, utilities and public outreach, and condition assessments and damage mitigation procedures. HRSD is not pursuing VCFPF funding for this line item but is seeking DCR approval for design-related costs incurred prior to the POP to be considered an eligible pre-award cost.
  - b. Pre-Construction \$40,828: Includes preparation of bid documents and pre-bid meeting activities.
3. Property Acquisition \$590,000: The estimated cost for the acquisition of the property where the new pump station will be located. GF completed an analysis of site alternatives for Dozier's Corner Pump Station, exploring 19 different locations. The desired location is approximately 40 feet to the north-northeast of the existing pump station and was selected due to its higher grade and proximity to the existing pump station. The property is currently owned by the Roosevelt Memorial Park Cemetery. HRSD is not pursuing VCFPF funding for this line item but is seeking DCR approval for the property acquisition to be considered an eligible pre-award cost should it be incurred prior to the POP.
4. Construction \$6,224,841: Estimated construction expenses include the following categories. This project is included in HRSD Capital Improvement Program for FY25-34, and the estimated cost of construction is lower than previously anticipated.
  - a. Site Work \$1,519,034: Includes demolition, mobilization, erosion control, excavation, culvert replacement, and clearing and grading.

- b. Mechanical \$382,161: Includes piping, pipe appurtenances, pumping equipment, and HVAC internal to the pump stations.
- c. Structural \$874,265: Includes dewatering, foundations, walls, cranes, platforms, and roof trusses.
- d. Electrical \$265,547: Includes electric service and duct banks, motor control center, diesel generator, and lighting.
- e. Process Control System \$168,112: Includes control panels, safety panels, variable frequency drives, instrumentation, startup, and testing.
- f. Construction Administration \$157,574: Includes project utilities, site security, and removal and disposal of construction debris.
- g. Permits and Fees \$1,679,805: Includes permits such as Chesapeake Construction General Permit, Commercial Right-Of-Way Permit, Building Permit, and Demolition Permit.
- h. Contingency \$841,673: The contingency covers unforeseen costs. This cost was estimated using the industry standard cost classes for estimated cost ranges as defined by the Association for the Advancement of Cost Engineering. The Dozier's Corner PS budget corresponds to a Class 5 cost estimate, which is defined as a project definition between 0% and 2% with expected accuracy range of -50% under and +100% above calculated cost. Consistent with the preliminary nature of the project, contingency of 25% is applied to direct costs:  $\$3,366,693 \times .25 = \$841,673$ .
- i. Escalation \$336,669: The escalation provides for increases in the cost of labor, equipment, and materials due to price changes over time. An escalation rate of 10% was applied to direct costs:  $\$3,366,693 \times .1 = \$336,669$ .

	Description	Cost	CFPF Grant Share	HRSD Grant Match	HRSD Non-Match Share	Notes
1	Preliminary Engineering Report (PER)	\$196,495		\$196,495		Pre-Award & Match
2	Design	\$913,094		\$909,211.25	\$3,882.75	Pre-Award & Match; Design and Pre-construction are under the same contract. The total cost for these activities is \$953,922.
3	Property Acquisition	\$590,000			\$590,000	Separate from grant request
4	Pre-Construction	\$40,828	\$40,828			Grant Share

	Description	Cost	CFPF Grant Share	HRSD Grant Match	HRSD Non-Match Share	Notes
5	Construction (detailed below)	\$6,224,841	\$6,224,841			Grant Share
5a	Site Work	\$1,519,034				Grant Share
5b	Mechanical	\$382,161				Grant Share
5c	Structural	\$874,265				Grant Share
5d	Electrical	\$265,547				Grant Share
5e	Process Control System	\$168,112				Grant Share
5f	Construction Administration	\$157,574				Grant Share
5g	Permits and Fees	\$1,679,805				Grant Share
5h	Contingency (25%)	\$841,673				Grant Share
5i	Escalation (10%)	\$336,669				Grant Share
	<b>Totals</b>	\$7,965,258	\$6,265,669	\$1,105,706.25	\$593,883	
			85%	15%		

CID519999\_HRSD\_CFPF-2\_FloodData

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

#### SOW Supporting Information – Historic Flooding Data and Hydrologic Studies

*Provide information on the flood risk of the project area, including whether the project is in a mapped floodplain, what flood zone it is in, and when it was last mapped. If the property or area around it has been flooded before, share information on the dates of past flood events and the amount of damage sustained.*

The Dozier's Corner Pump Station project is in a mapped Flood Zone AE, source USGS National Map 2023. The FEMA National Flood Hazard Layer FIRMette map is attached.

Additional details are provided in the Gannett Fleming report, "HRSD Dozier's Corner Pump Station Replacement Alternatives Evaluation." Dozier's Corner Pump Station is also part of a broader CDM Smith climate change planning study, "Pumping Facilities Vulnerability Assessment Technical Memorandum." Both studies are in the Supporting Documentation section of the application

This facility has experienced past flooding. The table below lists the dates, damages sustained, and approximate loss. The highest expense was labor for repairing the pumps and components. The approximate loss does not evaluate the cost of damages to property, residents, or businesses that were impacted.

#### Historical Flood and Storm Damage at Dozier's Corner Pump Station

Date	Duration (days)	Approximate Loss	Description
Mar 5-9, 1962	4	\$60,000	Ash Wednesday Storm – Damaged pumps and electrical panels due to storm rain and flooding.
Sep 27, 1985	1	\$30,000	Hurricane Gloria dropped 5.65" of rain – Components needed to be rebuilt due to flooding of dry well.
Jan 27-28 & Feb 3-6, 1998	5	\$60,000	Back-to-back Nor'easters – Damaged pumps and electrical panels due to storm rain and flooding.
Aug 27, 1998	1	\$30,000	Hurricane Bonnie – Pump station components needed to be rebuilt due to flooding of dry well.
Sep 6, 1999	1	\$30,000	Hurricane Floyd dropped 6.80" of rain on Hampton Roads – Components needed to be rebuilt due to flooding of dry well.
Sep 23, 2003	1	\$30,000	Tropical Storm Isabelle – Components needed to be rebuilt due to flooding of dry well.
Oct 8-9, 2016	2	\$30,000	Hurricane Matthew – Components needed to be rebuilt due to flooding of dry well.

Attachment (1)



# National Flood Hazard Layer FIRMette

1109 Keats Street, Chesapeake, VA 23320



76°16'43"W 36°46'8"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

76°16'5"W 36°45'39"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/1/2024 at 4:19 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

CID519999\_HRSD\_CFPF-2\_NoAdverseImpact-CFM

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

**SOW Supporting Information – No Adverse Impact**

*Include studies, data, reports that demonstrate the proposed project minimizes flood vulnerabilities and does not create flooding or increased flooding (adverse impact) to other properties.*

The proposed project is for Design and Construction with the goal to minimize flood vulnerabilities of the Dozier's Corner Pump Station. This project will not create flooding, increase flooding, or adversely impact other properties.

In addition to the resilient pump station, this project will address the collapsed, undersized City stormwater culverts adjacent to the pump station which are known to cause localized upstream pluvial flooding.

HRSD, the City of Chesapeake, and Gannett Fleming have been closely coordinating during the project design phase, which initially included a Hydrologic and Hydraulic Study that would focus on the proposed stream improvements. However, prior to performing the study, the City of Chesapeake determined that upgrading the triple culverts from 30" RCP to 42" RCP would be acceptable, and no additional analysis would be required. Communication with the City's CFM regarding the analysis can be found in the attached email, "HRSD pump station access road." As the proposed pump station will be replacing the existing pump station rather than adding to the existing structure, there will be no adverse impact to the surrounding area.

**Attachments:**

1. Endorsement from the Certified Flood Manager (CFM) – Amanda J. Hess, P.E., CFM, Gannett Fleming Inc.
2. Email re: HRSD pump station access road



11837 Rock Landing Drive  
Suite 200  
Newport News, VA 23606  
P 757.493.2319

[gannettfleming.com](http://gannettfleming.com)

November 12, 2024

Virginia Department of Conservation and Recreation  
600 East Main Street, 4th Floor  
Richmond VA 23219

To Whom it May Concern,

The Dozier's Corner Wastewater Pump Station (PS) is located at 1109 Keats Street in the City of Chesapeake, Virginia (City) along Newton Creek, a tributary of the Elizabeth River. It is operated by Hampton Roads Sanitation District (HRSD). FEMA has mapped the PS within a Zone AE Special Flood Hazard Area (Panel 5100340025D) with a Base Flood Elevation (BFE) of 8.0 feet. No regulatory floodway has been established.

The existing PS is constructed at an elevation of less than 7.0 feet and has experienced several flood events which have caused disruption to service. The three culverts along the PS access road have reportedly contributed to the flooding. Site survey indicates that two of the three culverts are crushed/damaged.

The Dozier's Corner PS serves approximately 1 square mile of residential, commercial, and industrial users. Constructed in 1961, the PS is nearing the end of its useful life. Additionally, HRSD has been mandated by Federal Consent Decree from the Environmental Protection Agency and Virginia Department of Environmental Quality to address the flooding issues at pump stations. The Dozier's Corner Pump Station Replacement Project will rebuild and elevate or otherwise protect the aging PS and will upgrade components to safely operate and continue to provide wastewater pumping services in the surrounding community. The project will also increase the size of the reinforced concrete culverts along the PS access road from 30-inch diameter to 36-inch diameter.

According to Section 26-94 of the City of Chesapeake Zoning Ordinance, the Special Floodplain District includes areas identified as an AE Zone on the FIRM for which 100 year flood elevations have been determined. Therefore, the PS site is located within a Special Floodplain District.

Between October 3 and October 9, 2024, Gannett Fleming coordinated with the Department of Development & Permits, Development Engineering Division of the City of Chesapeake, Virginia regarding the plans to increase the level of service by enlarging the culverts and raising the access road. The City evaluated the request based on a recently updated master drainage model for the area and concluded that upgrading the culverts from 30-inch diameter to 36-inch diameter is acceptable and that no analysis is required.





Development associated directly with the pump station will also take place within the Special Floodplain District. The development will consist of demolishing the existing pump station and constructing a new wet well, valve vault structure, and adjacent control building. The top slab of the wet well and valve vault structure will be essentially at-grade, and the structure will be flood proofed. The adjacent control building will be located at a portion of the floodplain with a higher original ground elevation than the existing pump station that will be demolished, therefore providing less encroachment to the floodplain and less flood risk. These project details were shared with the City, and the City has indicated that the project will need a variance. Gannett Fleming intends to work with the City during the design process to ensure that the project meets all of the City requirements and can obtain the necessary variance as needed.

Section 26-101 of the Zoning Ordinance requires that until a regulatory floodway is designated on the FIRM or the city's master drainage plans, no new construction, substantial improvements, or other development (including fill) shall be permitted at any point within the district, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point. The requirements for the Special Floodplain District are consistent with the Code of Federal Regulations 44CFR 60.3.

The PS Replacement Project includes construction and development within a Special Floodplain District. Based on the City's master drainage model, the City concluded that modifications associated with the culverts were acceptable and consistent with the requirements of the City of Chesapeake Zoning Ordinance and the Code of Federal Regulations. Gannett Fleming intends to work with the City during the design process to ensure that the project meets all of the City requirements and can obtain the necessary variance as needed.

As a Certified Floodplain Manager, this letter serves as my endorsement of the project.

Sincerely,

Gannett Fleming, Inc.

A handwritten signature in blue ink that reads "Amanda J. Hess".

Digitally signed by Amanda J Hess  
DN: cn=US, e=ahess@gannett.com,  
o=Gannett Fleming, Inc., cn=Amanda J  
Hess  
Reason: I am the author of this document  
Date: 2024.11.12 16:37:31-05'00'

Amanda J. Hess, P.E., CFM  
Vice-President, H&H Group Manager

**From:** Arnold Lapid <[alapid@cityofchesapeake.net](mailto:alapid@cityofchesapeake.net)>  
**Sent:** Wednesday, October 9, 2024 8:52 AM  
**To:** DiNatale, Liz <[edinatale@GFNET.com](mailto:edinatale@GFNET.com)>  
**Cc:** Lewis, Nicholas <[nlewis@GFNET.com](mailto:nlewis@GFNET.com)>; Logue, J. Kyle <[jlogue@GFNET.com](mailto:jlogue@GFNET.com)>  
**Subject:** RE: HRSD pump station access road

**[EXTERNAL EMAIL]:** This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Liz,

I discussed this with my supervisor, Mark Curry, and we looked at the recently updated master drainage model for the area. With future upstream improvements upstream of that area, we have determined that upgrading those triple culverts from 30" RCP to 36" RCP would be acceptable. No analysis would be required.

Sincerely,



*Arnold A. Lapid, P.E., C.F.M.*

Development Services Coordinator  
Department of Development & Permits  
Development Engineering Division

**Main:** (757) 382-6101

**Direct:** (757) 382-6126

[www.CityOfChesapeake.net](http://www.CityOfChesapeake.net)

---

**From:** Arnold Lapid  
**Sent:** Thursday, October 3, 2024 4:12 PM  
**To:** 'DiNatale, Liz' <[edinatale@GFNET.com](mailto:edinatale@GFNET.com)>  
**Cc:** Lewis, Nicholas <[nlewis@GFNET.com](mailto:nlewis@GFNET.com)>; Logue, J. Kyle <[jlogue@GFNET.com](mailto:jlogue@GFNET.com)>  
**Subject:** RE: HRSD pump station access road

Liz,

Thanks for the info. As Jay mentioned, I will check on the type of analysis required and get an answer for you probably middle of next week.

Sincerely,



**Arnold A. Lapid, P.E., C.F.M.**

Development Services Coordinator  
Department of Development & Permits  
Development Engineering Division

**Main:** (757) 382-6101

**Direct:** (757) 382-6126

[www.CityOfChesapeake.net](http://www.CityOfChesapeake.net)

---

**From:** DiNatale, Liz <[edinatale@GFNET.com](mailto:edinatale@GFNET.com)>

**Sent:** Thursday, October 3, 2024 4:07 PM

**To:** Arnold Lapid <[alapid@cityofchesapeake.net](mailto:alapid@cityofchesapeake.net)>

**Cc:** Lewis, Nicholas <[nlewis@GFNET.com](mailto:nlewis@GFNET.com)>; Logue, J. Kyle <[jlogue@GFNET.com](mailto:jlogue@GFNET.com)>

**Subject:** HRSD pump station access road

<b>ALERT:</b> External E-mail. Use caution when opening attachments or clicking links.
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Hi Arnold,

Thanks again for yours and Jay's time earlier. I think I can better articulate my question through an email. HRSD has contracted with Gannett Fleming to complete an alternatives analysis and identify the best solution for the pump station found adjacent to the Roosevelt Memorial Park. I've attached an exhibit that better describes the preferred solution.

I've been tasked with designing the hydraulic conveyance of the tributary under the access road. The existing structures are in disrepair and the client would like to increase the level of service of the access road. To that end, the access road will be built with a higher crown elevation. This hasn't been designed yet and I can't be sure how high that is at this time.

It sounded like from the call that all we would need to show is hydraulic calculations confirming the pipe sizes would carry the flow for the drainage basin. Please confirm that the city will not also need a HEC-RAS analysis comparing the existing conditions to the proposed conditions.

I've touched base with the others about the Variance we spoke about and they should be in touch with your office.

Thank you so much for your help. I am at your disposal if you would like to talk through this.

**Liz DiNatale, PE, TSP** | S. Project Engineer, Environmental

**Gannett Fleming TransSystems**

One Glenwood Avenue, Suite 900, Raleigh, NC 27603

**O** 984-389-2556 | **C** 919-606-9831 | [edinatale@gfnet.com](mailto:edinatale@gfnet.com)

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CID519999\_HRSD\_CFPF-2\_CostShare-CFOLetter

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

#### SOW Supporting Information – Ability to Provide Share of Costs and Pledge

*Include supporting documents demonstrating the local government's ability to provide its share of the project costs. This must include an estimate of the total project cost, a description of the source of the funds being used, evidence of the local government's ability to pay for the project in full or quarterly prior to reimbursement, and a signed pledge agreement from each contributing organization.*

HRSD has AA+ S&P and Fitch ratings and is committed to meeting its obligations and financial integrity. A letter from HRSD's Chief Financial Officer is attached and assures that HRSD will pay project costs prior to reimbursement. The project will be funded through HRSD CIP budget and any grant funds awarded.

As identified in the budget, HRSD's match for this project application is 15% or \$1,105,706.25, and is based on the CFPF grant share requested \$6,265,669, for a grant project cost of \$7,371,375.25. Please note, in the letter from the CFO, the dollar amounts are rounded to the whole dollar.

HRSD requests approval from Virginia Department of Conservation and Recreation to allow the \$1,105,706.25 match to be covered by pre-award procurement of contractual services for the preliminary engineering report (\$196,495) and the design document (\$909,211.25). These contracts are necessary to achieve the project, and are or will be procured at a reasonable cost and adequately documented.

The total project is estimated at \$7,965,258. This is \$593,882.75 more than the grant project. HRSD will cover this difference and any costs that exceed the grant award.

There are no financial contributions from other organizations; however, the City of Chesapeake provided a Letter of Support, attached in the application Supporting Documentation.

Attachment: Letter from CFO (signed pledge agreement)



November 26, 2024

Virginia Department of Conservation and Recreation  
Attention: Virginia Community Flood Preparedness Fund  
Division of Dam Safety and Floodplain Management  
600 East Main Street, 24<sup>th</sup> Floor  
Richmond, VA 23219

Re: Grant Application for the Virginia Community Flood Preparedness Fund Round 5

Dear Sir/Madam:

Hampton Roads Sanitation District (HRSD) is applying for the Community Flood Preparedness Fund for the Dozier's Corner Pump Station project. HRSD fully supports the project, and it has been approved in the FY 2025 Capital Improvement Plan by the HRSD Commission, our governing body.

The total grant project budget is \$7,371,375. HRSD is applying for \$6,265,669 through the CFPF grant, and commits to a \$1,105,706 match (15%). The budgeted match consists of contractual services to be procured pre-award with approval from Virginia DCR. The completed project is currently estimated to cost \$7,965,258. HRSD will pay for the property acquisition necessary for this project and estimated at \$590,000, as well as other costs above the grant proposal amount. While HRSD has the liquidity to finance the project, it is awaiting the grant award notice before proceeding with the appropriation.

Thank you for this opportunity to apply for funding for this important project.

Sincerely,



Steve de Mik  
Chief Financial Officer



CID519999\_HRSD\_CFPF-2\_BCAREport

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

SOW Supporting Information – Benefit-Cost Analysis

*A benefit-cost analysis must be submitted with the project application.*

Attached is the benefit-cost analysis for Dozier's Corner Pump Station Replacement using the FEMA Benefit-Cost Calculator V.6.0.



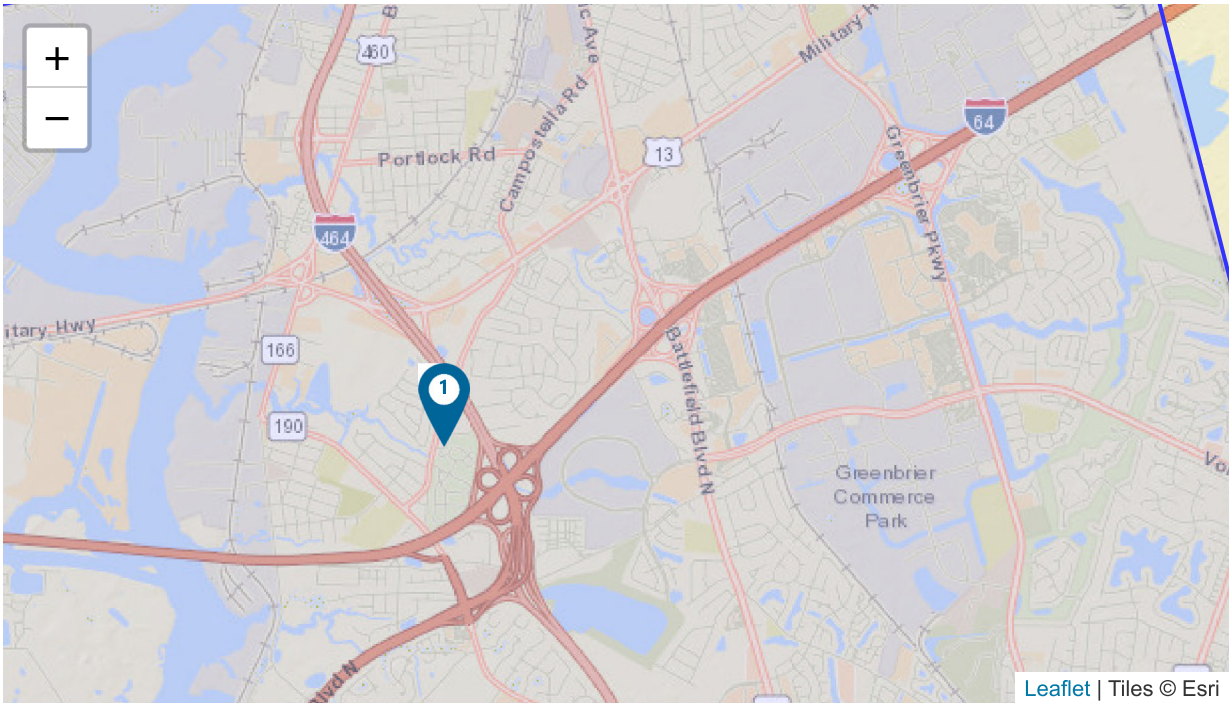
FEMA


Benefit-Cost Calculator

V.6.0 (Build 20241018.1218 | Release Notes)

Benefit-Cost Analysis

Project Name: Dozier's Corner Pump Station Replacement



Map Marker ▲	Mitigation Title	Property Type	Hazard	Discount Rate (%)	Benefits (B)	Costs (C)	BCR (B/C)
1	Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320		DFA - Coastal A Flood	3.1	\$ 11,158,449	\$ 8,437,638	1.32
TOTAL (SELECTED)					\$ 11,158,449	\$ 8,437,638	1.32
TOTAL					\$ 11,158,449	\$ 8,437,638	1.32

Property Configuration

Property Title:	Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320
Property Location:	23320, Chesapeake, Virginia
Property Coordinates:	36.76538061003181, -76.27336914481734
Hazard Type:	Coastal A Flood
Mitigation Action Type:	Elevation
Property Type:	Utilities
Analysis Method Type:	Professional Expected Damages

Cost Estimation

Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

Discount Rate (%):	3.1%	Use Default:Yes
Project Useful Life (years):	50	
Project Cost:	\$7,872,329	
Number of Maintenance Years:	50	Use Default:Yes
Annual Maintenance Cost:	\$22,390	

Comments

•

Project Useful Life:

A pump station contains multiple elements with a wide variety of service lives. For simplicity, a pump station building is financially depreciated over a 30 year service life horizon according to HRSD's financial policy (see PROCEDURE Renewal Planning Model Treatment, PS, FM, Gravity Sections 7.1 & 7.2). In practice, all HRSD facilities are in constant stages of condition assessment and maintenance to extend service life appropriately. Therefore, while a pump station may need additional capital investment within a 30 year horizon, this investment rarely would rise to the level of complete facility replacement as scoped in the subject project. For example, the existing facility is 64 years old, therefore we have chosen to utilize the FEMA default value of 50 years as a conservative estimate.

•

Mitigation Project Cost:

The initial project cost is \$7,872,329. This includes the PER (\$196,495), design (\$829,869), property acquisition (\$590,000), pre-construction (\$31,124), and construction (\$6,224,841). The construction costs include contingency and escalation in accordance with AACE International Class 5 categorization.

•

Annual Maintenance Cost:

Annual maintenance is based on the maintenance costs for the existing Dozier’s Corner, not counting power or fuel for the bypass pump. The total from 1/1/2020 to date is \$111,952.38, averaging roughly \$22,390.48/yr. Use \$22,390 for BCA. This estimate is likely higher than what we would expect to spend on the new facility which will predominantly be proactive maintenance as opposed to both proactive and reactive maintenance needed for a facility at the end of its useful life.

Damage Analysis Parameters - Damage Frequency Assessment	
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320	
Year of Analysis was Conducted:	2023
Year Property was Built:	1960
Analysis Duration:	64    Use Default:Yes

Comments

•

Analysis Year:

Refer to final report date of May 2023 for "Flood Risk in a Changing Climate" report.

Utilities Properties  
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

Type of Service:	Wastewater
Number of Customers Served:	3,106
Value of Unit of Service (\$/person/day):	\$71    Use Default:Yes
Total Value of Service Per Day (\$/day):	\$220,526

Comments

- 

Type of Service:

HRSD is the only public provider of wastewater treatment service in Hampton Roads. HRSD assets include treatment plants, pump stations, and pipelines. <https://www.hrsd.com/about-us>

- 

Number of Customers Served:

Reference "Pumping Station Vulnerability Assessment" Section 3.1.4 for population served estimate methodology. Value entered is found in the CCPS\_PS\_PRS\_VA\_Inputs\_Master\_20230515.xlsx excel file Sheet "7 Population Served" cell B49

Professional Expected Damages Before Mitigation  
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

	WASTEWATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Temp Equipment Rental (\$)	Repairs (\$)	Emergency Equipment (\$)	Number of Volunteers	Number of Days	Damages (\$)
10	14	32,600	1,370,616	0	0	0	4,490,580
100	14	32,600	1,370,616	0	0	0	4,490,580
500	14	32,600	1,370,616	150,000	0	0	4,640,580

## Comments

- 

### Damages Before Mitigation:

Insuring this facility can withstand a 100 year flood event is a specific requirement of HRSD's EPA Federal Consent Decree. Reference "Pumping Facility Vulnerability Assessment" pp. 78, Slide 54 showing existing critical elevations and the flooding elevations of various recurrence intervals for Dozier's Corner Pump Station. The lowest point of entry (LPE) of the building is 5.6 ft NAVD88. Once the water level exceeds this elevation damage to the facility would begin to occur. In the 100 year recurrence event, the same damage would occur with the addition of the elevated emergency equipment valued at \$150,000. Value entered is found in the CCPS\_PS\_PRS\_VA\_Inputs\_Master\_20230515.xlsx excel file Sheet "9

VulnerabilityAssessmentInputs" cell AG56. Reference "Pumping Facility Vulnerability Assessment" pp. 18, Section 3.4.1 for days the facility would be impacted. The existing pumps are not submersible, therefore use 14 days where the pumping facility will be offline. Reference "Pumping Facility Vulnerability Assessment" pp. 125, Appendix F for temporary equipment rental. Dozier's Corner PS is classified as a small unique (decoupled) pump station therefore we use Hilton School PS as the representative facility. One time setup cost of \$2,000 plus 9 months of equipment rental at \$3,400/month gives a total of \$32,600. Repair costs include replacement of critical building and electrical assets. Value entered is found in the CCPS\_PS\_PRS\_VA\_Inputs\_Master\_20230515.xlsx excel file Sheet "9 VulnerabilityAssessmentInputs" sum of cells V41 and O41. FEMA Base Flood Elevation is 8 ft.

#### Annualized Damages Before Mitigation

Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

Annualized Recurrence Interval (years)	Damages and Losses (\$)	Annualized Damages and Losses (\$)
10	4,490,580	404,152
100	4,490,580	36,520
500	4,640,580	9,281
	Sum Damages and Losses (\$)	Sum Annualized Damages and Losses (\$)
	13,621,740	449,953

#### Professional Expected Damages After Mitigation

Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

	WASTEWATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Temp Equipment Rental (\$)	Repairs (\$)	Emergency Equipment (\$)	Number of Volunteers	Number of Days	Damages (\$)
100	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
501	14	32,600	890,000	0	0	0	4,009,964

Comments

- 

Damages After Mitigation:

Replacement pump station facility will be fully protected for the 100 year flood recurrence event as required by HRSD's EPA Federal Consent Decree. Facility design is currently in the preliminary engineering phase but shall withstand the 100 year flooding event. An event of this magnitude would completely inundate the majority of the service area of this facility as shown with LiDar data "Layout\_DozierCornerPS\_ServiceArea\_Elevation.pdf". This data also shows that even in the 100 year event the planned Dozier’s Corner PS would be one of very few facilities to survive such an event. Repair costs include replacement of electrical assets. Value entered is found in the CCPS\_PS\_PRS\_VA\_Inputs\_Master\_20230515.xlsx excel file Sheet "9 VulnerabilityAssessmentInputs" cell AO41. FEMA Base Flood Elevation is 8 ft. The 500-year flood elevation for these structures is estimated at 10 feet per the FEMA NFIP building codes. The 500-year elevation is calculated using the FEMA Technical Fact Sheet 1.6 which states the elevation for the 500-year flood event in a coastal flood hazard area can be approximated by multiplying the elevation of the 100 year BFE by 1.25 (8' \* 1.25 = 10'). The American Society of Civil Engineers (ASCE), Flood Resistant Design and Construction, also identifies flood design elevations for coastal high hazard areas as BFE + 2 feet, or 500-year flood elevation, whichever is higher. In this case both criteria result in a 10' elevation. Based on the calculations provided above, The HRSD proposal for an 11-foot elevation meets or exceed the criteria for the 500-year elevation.

Annualized Damages After Mitigation		
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320		
Annualized Recurrence Interval (years)	Damages and Losses (\$)	Annualized Damages and Losses (\$)
10	0	0
100	0	0
500	0	0
501	4,009,964	8,004
	Sum Damages and Losses (\$)	Sum Annualized Damages and Losses (\$)
	4,009,964	8,004

Benefits-Costs Summary		
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320		
Discount Rate (%):	3.1%	Use Default:Yes
Total Standard Mitigation Benefits:	\$11,158,449	
Total Social Benefits:	\$0	
Total Mitigation Project Benefits:	\$11,158,449	
Total Mitigation Project Cost:	\$8,437,638	
Benefit Cost Ratio - Standard:	1.32	
Benefit Cost Ratio - Standard + Social:	1.32	



CID519999\_HRSD\_CFPF-2\_RepetitiveLoss

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

#### SOW Supporting Information – Repetitive Loss

*Provide a list of repetitive loss and/or severe repetitive loss properties. Do not provide the addresses for the properties, but include an exact number of repetitive loss and/or severe repetitive loss structures within the project area.*

The Dozier's Corner Pump Station has experienced flood events but is not considered a repetitive loss or severe repetitive loss property. Within the two census tracts included in Dozier's Corner Pump Station's service area, 18 structures are considered repetitive loss, and one structure is considered severe repetitive loss.

## CID519999\_HRSD\_CFPF-2\_Deliverables

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

### SOW Supporting Information – Approach, Milestones, and Deliverables

*Outline a plan of action laying out the scope and detail of how the proposed work will be accomplished with a timeline identifying expected completion dates. Determine milestones for the project that will be used to track progress. Explain what deliverables can be expected at each milestone, and what the final project deliverables will be. Identify other project partners.*

**Scope:** Full details of the plan of action are provided in the Scope of Work document, CID519999\_HRSD\_CFPF-2\_SOWNarrative. As stated in the Scope of Work, the Dozier's Corner Pump Station project includes the design and construction of the pump station in accordance with HRSD's Rehabilitation Action Plan and the EPA's Federal Consent Decree by May 2027. These activities will include the acquisition of property for the new Pump Station and stream crossing improvements at Newton Creek.

**Details:** The proposed project schedule can be found in Table 1 below. As the Pump Stations' design is finalized, additional construction related milestones will be identified to ensure that the project remains on schedule.

The HRSD Design and Construction team will work with HRSD Procurement to appropriately acquire the property where the new pump station will be located, and work with the HRSD contract specialists and to procure services for design and construction contractors. All procurement will be conducted in compliance with the relevant Virginia regulations and with sufficient details to meet the needs of the project scope.

The Design and Construction project manager will oversee the progress of the deliverables and review with the team to ensure all requirements are met on budget and in a timely manner. The contract specialists and financial analyst will ensure accurate invoices and reimbursement requests are filed on time.

HRSD is primarily responsible for the completion of the project. However, they will rely on contract support throughout the project.

**Deliverables:** The Preliminary Engineering Report milestone has already been produced.

The Design milestone has several deliverables, including the complete project design, relevant and necessary permits obtained through engagement with regulatory stakeholders, and bid-ready documents for construction.

The Acquisition of property where the new Pump Station will be constructed is a crucial deliverable that will occur during Project Design milestone.

The Design Bid milestone is where the bid-ready documents are released, construction proposals reviewed, and a final selection made with a contract agreement.

The Construction milestone deliverable is the successful completion of the new Pump Station prior to the regulatory deadline of May 2027.

**Table 1. Timeline, Milestones, Deliverables**

Action	Milestones	Deliverables	Timeframe
Preliminary Engineering Report (PER)	<ul style="list-style-type: none"> <li>• PER kickoff meeting with HRSD and firm</li> <li>• Draft PER review</li> </ul>	Final PER	Jan-24 to May-24*
Project Design, Regulatory Approvals, Utilities, Public Outreach, Acquisition	<ul style="list-style-type: none"> <li>• Design kickoff meeting</li> <li>• 60% Design review</li> <li>• 90% Design review</li> </ul>	Bid-ready documents, project design, property acquisition	13 months following the PER or Oct-24 to Jun-25
Design Bid	<ul style="list-style-type: none"> <li>• Bidding</li> </ul>	Contract Agreement	3 months after the Bid-ready documents or Jun-25 to Aug-25
Construction	<ul style="list-style-type: none"> <li>• Site Work</li> <li>• Final Construction</li> <li>• Inspections</li> </ul>	Pump Station Complete	22 months after the contract agreement or Aug-25 to May-27
Reports	<ul style="list-style-type: none"> <li>• Progress and Financial Reports</li> </ul>	Timely, completed reports	Per award document
Final Project Deliverable	<ul style="list-style-type: none"> <li>• Inspection</li> </ul>	Close-out report	43 months from award execution

\*Please note that PER references when work on Dozier's Corner Pump Station began in Jan-24, and not during the grant period of performance.

**Partners:** HRSD is responsible for the completion of the project and will rely on contract support throughout the project.

- Gannett Fleming (GF) will provide a complete PER, project design, and relevant permit applications to regulatory stakeholders, and will support HRSD in the pre-construction bid phase by developing the bid documents, attending relevant bid meetings, performing bid analysis, and preparing Confirmed Documents.
- HRSD will select a contractor to perform the construction, and the selected contractor will be responsible for adhering to the project design developed by GF and completing specific construction tasks on budget and in a timely manner.
- The City of Chesapeake, where the Pump Station is located, will be a partner throughout the duration of the project. A letter of support from the city underlining the importance of the project is attached to the application. Following the completion of the Dozier's Corner Pump Station, ownership of the property and facility may be transferred to the city. Chesapeake will then be responsible for the maintenance of the project for the duration of the Pump Station's lifespan. Chesapeake will maintain the facility in accordance with the HRSD Maintenance Manual, also attached as a supporting document. The manual outlines the relevant activities required to prolong the life of the facility, including general maintenance procedures and part specific maintenance procedures to be performed on a regular basis outlined on Form 5-14, which can be found on page 76 of the manual.

CID519999\_HRSD\_CFPF-2\_MMMPlan

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

#### SOW Supporting Information – Maintenance, Management, and Monitoring Plan

*For ongoing projects or projects that will require future maintenance, such as infrastructure, flood warning and response systems, signs, websites, or flood risk applications, a maintenance, management, and monitoring plan for the projects must be provided.*

The Dozier's Corner Pump Station is a design and construction project. Future maintenance will follow the attached HRSD Interceptor Systems Preventive Maintenance Manual, section 5, updated June 2023 (or as replaced). Any additional maintenance needs will be determined by the design and will be added to the plan as needed.

Attachment (1)

# Interceptor Systems Preventive Maintenance Manual



Second Edition, 1998

*Updated June 2023*

*-Generally-*

The greater amount of preventive maintenance performed reduces the amount of corrective maintenance that will be required.

# **Interceptor Systems Preventive Maintenance Manual**

## **Table of Contents**

I.	Building Maintenance and Inspection
II.	Diesel Generators
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*The table of contents and all sections removed, except Section 5, Pump Stations*

## **5. PUMP STATIONS**

Pump stations are a vital link to our overall system and must be treated as such. The Interceptor Technician should be aware of all problems and maintenance procedures required by each station. Typical pump station inspection forms are included as Forms 5-1 through 5-12. Pump station frequency schedule is listed on Form 5-13.

Any unusual condition that occurs at these stations should be reported immediately to the appropriate supervisor.

### **5.1. General**

Below is a list of general maintenance procedures to be performed on a regular basis. Frequency will range from once to month to as much as twice a week or as station needs dictate.

1. Transfer leads and lags, etc. on pumps and compressors in accordance with standing instructions.
2. Check level sensing devices (i.e., air compressor, transducers, etc. and air pressure; drain condensate.
3. Purge bubbler.
4. Where feasible, exercise all inactive pumps and check all pumps to ensure that they are operable.
5. Check dry well sump pump
6. Clean pump station and perform general housekeeping.
7. Clean wet well bar screen, hose (wash) floor and wall; check wet well for proper ventilation.
8. Inspect grinder
9. Visually check ALL piping and equipment to include light fixtures.
10. Test diesel generators and alarm systems.
11. Flush pressure sensors and bleed transducer units (where applicable).
12. Odor control systems
13. Exhaust fan systems
14. Redundancy systems (Generators, Interim Pumps, Temporary Pumps)
15. Alarm system
16. Log ALL clock readings; sign daily log book, include duties performed, date and time.

All maintenance performed, whether preventive or otherwise, shall be noted in the station log.

### **5.2. Air Compressor**

Preventive maintenance on air compressors includes the following:



- Keep unit clean
- Drain condensate
- Test safety valves
- Check pet cocks for leakage
- Examine operating controls
- Check bubbler line
- Manual purge
- Check air filter(s)
- Check dehumidifier.

#### **5.2.1. Condition Check**

All compressors should be thoroughly cleaned. Dirt, oil, grease, and other material must be thoroughly cleaned off the compressor and surrounding area. Check for leaks, unusual vibrations, etc. If compressor shows evidence of overheating or excessive noise, isolate from system until the cause is determined and repairs are made. Note that excessive running time on compressor would be indicative of air leak in system.

#### **Electrical Isolation – Only with Proper Authorization**

Place the compressor motor power supply switch (or circuit breaker) in the OFF position and tag with a "WARNING" card to prevent unit operation. Disconnect electric cord. Reverse procedure for restoration.

#### **5.2.2. Drain Condensation**

Drain the condensate (condensed water) from the air tank according to schedule or as needed. There is usually a small drain valve at the bottom of lower portion of the tank for this purpose.

#### **5.2.3. Safety Valve**

Test the safety valves. They prevent excessive pressure build-up by opening and venting to the atmosphere and are located on the air storage tank. To test the safety valve (or pop-off valve), lift the lever allowing air to escape; this will ensure the valve is operating properly.

#### **5.2.4. Operating Controls**

Examine operating controls. Make certain that compressor is starting and stopping at the proper settings by bleeding air from the tank through the drain valve. Inspect gage for accuracy; compare readings with recorded start-up values or other known readings. Dual Compressor Installations: Ensure that they are staged correctly, change leads according to schedule.

#### **5.2.5. Bubbler Line**

Check bubbler line. If the rotameter has a marking on the panel, check to see that the setting corresponds to the mark. These are typically located inside the control cabinet and therefore require the proper electrical PPE and safety training to access.

### **5.2.6. Manual Purge**

Purge the line. Depress the button on the control panel marked PURGE. This will automatically shut off the air to the pressure mechanism and provide a direct flow of air to the compression bell, purging the line. When released, controls return to normal operation.

In stations that are using with ControlWave operating systems, lines are purged by using the control screen (OIT) on the control cabinet.

*Note: An increase in gage pressure when purge button is activated is indicative of a problem - notify supervisor.*

### **5.2.7. Dehumidifier**

A visual inspection of this unit shall be performed and will include the following:

- Power on Light (green) - indicates power to the unit.
- High Air Temperature Warning Light (red) - gives indication of refrigeration system malfunction or overloading.
- Automatic Condensate Drain Trap - this is an automatic operation; check for any visible blockage.

In the event of a red light condition, isolate unit from its power source, tag with a WARNING card, and notify appropriate supervisor.

### **5.3. Level Transducer**

Check transducer stilling well for any obstructions such as grit or grease. Verify water flow is not restricted. Remove the transducer from the stilling well to test for proper operation and cleaning.

### **5.4. AUTOCON and/or Float Ball – Drywell**

- All system AUTOCON bells and mounting brackets, the plastic tubing and wall fasteners, and the tubing connections at the bell and the inlet side of the diaphragm enclosure shall be carefully inspected in each station. Promptly report any discrepancies to the appropriate Supervisor.
  - Float Balls – Make sure it works, at the right level, properly secured.

### **5.5. Ventilation**

Turn on exhaust fan(s) before entering wet well and/or drywell. Promptly report any problems incurred with installed ventilation to the appropriate Supervisor. Treat area being serviced by the exhaust fan as a confined space and provide portable ventilation as need. If problem does exist, turn power switch in control panel to the OFF position. If possible, lock in OFF position to prevent accidental power supply to the unit, and tag with a WARNING card. Exhaust fans should be turned off when leaving pump stations.

Installed ventilation shall be checked in accordance with the provided scheduled. Maintenance and inspection of installed ventilation shall be performed annually and consist of the following:

- Ensure power is turned off and breaker is locked in the OFF position.

- Prevent fan blades from unintentionally rotating prior to working on any moving component. Refer to HRSD SAFETY SOP for work on STAND DOWN and fans.
- Spin the motor shaft. Shaft should turn freely.
- Check belt(s) for any wear.
- Check sheave set screws to ensure tightness.
- Clean and remove any dirt/dust on the exterior of the motor, fan panel and propeller in accordance with manufacturer's recommendations.
- Remove lock and power ON unit.
- If grease fittings are provided, clean the fitting and apply a manufacturer's recommended grease at a very slow rate until a bead is formed. This should be done with the unit in operation.

#### **5.5.1. Maintenance**

Exhaust fans should be inspected, cleaned and maintained annually in accordance with manufacturers recommended maintenance.

### **5.6. Hot and Cold Weather Preparations**

This area should include the following for cold weather preparations:

- Secure motor room heat exhaust fans where applicable.
- Close and/or install vent covers where applicable.
- Turn heat lamps ON where applicable.
- Insulate all pipes that are subject to freezing.
- If extremely cold temperatures are predicted, the water supply to the pump station should be turned off at meter with appropriate Supervisor approval.
- The above procedures are reversed in the spring in preparation for warmer weather (where applicable).

#### **5.6.1. Winterization of Emergency/Temporary/Interim Pumps:**

- Install heat lamps and apply heat tape to appurtenances susceptible to freezing.
- Six-inch pumps volutes and smaller are to be drained of water and filled with antifreeze as necessary.
- Exposed volutes and check valves are to be wrapped in heat tape.
- Block heaters are to be inspected for proper operation.

### **5.7. Backflow Prevention - General**

Backflow preventers used in pump stations are of two general types: Pressure Vacuum Breaker (VB) and

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Reduced Pressure Type (RP). These backflow preventers should be visually inspected per frequency schedule. Malfunction of these valves is usually indicated by weeping or dripping of the unit. Any leakage observed from these backflow preventers should be reported to the appropriate Supervisor. In case of substantial leakage, it may be necessary to cut the water supply OFF until the problem is corrected.

#### **5.7.1. Strainers**

Strainers on the water supply to the backflow preventers should be inspected and cleaned as needed.

#### **5.7.2. Annual Test and Inspection**

All Annual Test and Inspections will be scheduled by Facilities Maintenance Division and performed by a Certified Backflow Prevention Device worker approved by the local Jurisdiction. The results of the test of the individual backflow preventers are submitted to the appropriate local Jurisdiction Department of Utilities.

### **5.8. Pumps – General**

Keep exterior of pumps clean. Paint (touch-up) pump and components as needed. Keep all drains open and free of debris. Demonstrate that the wastewater pump is operable by starting the pump and observing its function. Run pumps manually and check if pumping at full speed. Observe the check valve (if possible) and the lowering of the well. Check for excessive oil or grease leakage from the bearings. Look for black powdery substance near bearings or shaft. Note if pump feels or smells hot. Note any unusual noises or vibrations; check applicable guards, shields, etc. Alternate pump leads in accordance with standing instructions.

#### **5.8.1. Packing Removal**

Packing is used to provide a seal where the shaft passes through the pump casing in order to keep air from being sucked into the pump and/or the water being pumped from coming out. Improper maintenance of packing can cause considerable damage to a pump sleeve and MUST periodically be replaced.

1. Turn pump main circuit breaker and control switch to the OFF position using lock out - tag out procedure.
2. If appropriate, close and tag pump suction and discharge valves prior to removal of packing glands.
3. Remove packing gland nuts and/or bolts and remove glands. Glands are usually split for easy removal. Visually inspect gland condition.
4. Remove packing. The packing rings can be removed by screwing a packing hook into each ring and pulling out. Sometimes it helps to rotate the shaft while pulling. Exercise caution while using the packing hook as to not nick or score the sleeve.
5. Inspect shaft and/or shaft sleeve for wear. See Ref. Para. 5.7.6.

#### **5.8.2. Packing Installation**

1. Cut packing to proper length. Packing should be kept free of dirt, sand, grit, or other foreign material. Make clean cuts (no ragged edges). Verify packing size and length prior to installation.
2. Stagger the joints (or butts) of the packing around the shaft.

3. Install packing gland, keeping the gland square with shaft at all times.
  - a. The last ring of packing may have to be installed after all other rings have been seated.
  - b. Tighten packing gland just enough to prevent excessive leakage starting pump. See Ref. Para. 5.8.3.
4. Open valves and restore pump to normal operation. Turn pump main circuit breaker and control switch to the ON position. Remove WARNING tag.

*Note: One additional packing ring may be added to the stuffing box when needed. Do not add more than one ring. Once this has been done, all old packing must be removed and new packing installed. Pump packing records should be maintained through the annual pump inspection report and on-site at the pump station. These records should be revised as needed.*

### **5.8.3. Packing Gland Adjustment**

Tighten packing gland just enough to prevent excessive leakage.

1. As the packing adjusts itself to the shaft, tighten the gland slowly one flat at a time on each nut, keeping the gland square until the leakage is reduced to approximately a slow trickle. Keep packing gland square with pump shaft to prevent rubbing of the two. To keep gland square:
  - a. Hand tighten first bolt until slack is taken up.
  - b. Insert other packing gland bolts and tighten to point of first resistance.
  - c. Tighten each bolt one flat at a time on alternate sides to insure an even take-up until the leak rate is properly adjusted. Uneven take-up jams the packing and the shaft. If the gland becomes too hot, it is pulled up too tight. Stop the pump and allow the packing to cool, and then readjust.

### **5.8.4. Pumping Range (on and off levels)**

This test is to check the ON and OFF levels which are set for all pumps.

1. Allow the wet well to fill until the lead pump comes on automatically.
2. Check that the pump starts at the correct level.
3. Shut the lead pump off and let the well continue filling until the second pump starts.
4. Check the starting level of this pump and continue with the same procedure until all pumps have been tested for starting level.
5. Turn all pumps on AUTO and check the stop (OFF) level as each pump stops.

*Note: Pumps at some stations may be staged differently. In this case, pump operating levels that do not correspond with the posted operating levels at a particular station should be brought to the attention of the appropriate Supervisor.*

### **5.8.5. Impellers**

1. Pump impellers should be inspected as part of the annual preventive maintenance check. Before inspecting a pump impeller:
  - a. Turn pump main circuit breaker and selector switch to the OFF position, utilizing lock out - tag out procedure.
  - b. Close suction and discharge gate valves (do not depend on discharge check valve).
2. Drain pump with bolts still in inspection plate until water stops (a precautionary step, in the event something prevents a valve from fully closing).
3. Open inspection plates and visually inspect for foreign objects which might cause injury (razor blades, sharp objects, etc.). Use a special hook or tool to remove debris. When the area is clear, the impeller can be inspected. When inspecting a pump impeller, check for:
  - a. Cavitation marks. These appear as holes, indentations, cracks, etc.
  - b. Chips, broken tips, corrosion, unusual wear.
  - c. Tightness on shaft. Hold shaft and try to wiggle impeller, inspect impeller nut. Pry up and down with a piece of wood.
  - d. Wearing rings on impeller and volute for thickness, clearance, and general condition.

#### **5.8.6. Shafting**

Pump shafts are used to turn the impeller, mount the bearings, and are connected to a pump driver (motor) of some type. Any maintenance performed on the shaft must be done with the motor switch in OFF position, utilizing lock out - tag out procedure. All components shall be checked according to frequency schedule unless stated otherwise.

1. Impeller end - where the impeller is secured onto the shaft. This part is usually not a problem to maintain if impeller is kept tight and is to be included as part of the annual preventive maintenance inspection.
2. Couplings - inspect coupling ends daily. Set screws must be tight, and if found continually loose must be replaced. Check keyway, bolts, etc.
3. Slip joint (splined) - accommodates endwise movement (1/2 to 3 1/4 inches according to size, type and length of shaft). Check that splines are not jammed into the yoke or that they are not extended beyond the limits of the yoke.
4. Pillow block bearings - visually inspect daily. Check for any unusual bearing vibration and/or noise.
5. Pump bearings - check for any unusual bearing vibration and/or noise daily.
6. Universal joints - to inspect, remove the shaft and test bearings by moving the yoke in all directions to roll the needles. If action is rough or uneven, replace.
  - a. A daily visual inspection will usually reveal bearing failure by the appearance of a brown powder in that area. When greasing, if grease does not come out of all four bearings, possible bearing failure is indicated.

b. Other clues to failing U-joints:

- i. Any play or detectable motion when joint is rocked back and forth (with unit OFF, but still coupled).
  - ii. Unusual noise or vibration while equipment is operating.
7. Sleeve (stuffing box area) - shaft sleeves are designed to protect the shaft by taking the wear from the packing. Shafts and/or sleeves in this area should be inspected each time the pump is repacked. This inspection is performed after the packing has been removed (See Ref. Para. 5.8.1) and the stuffing box area cleaned. Inspect for grooves, split shaft seal and any other unusual conditions. The sleeve should be replaced when grooves are observed and/or felt. A worn sleeve must be replaced before wearing through to the shaft.

#### **5.8.7. Bleed Line System**

The automatic bleed-off system on each pump should be checked daily for proper operation. Valves on the bleed-off system should be exercised daily to ensure proper operation. Replace components as needed.

#### **5.8.8. Lubrication**

All pumps, pillow block bearings, and universal joints shall be greased with an approved lubricant according to frequency schedule.

#### **5.8.9. Pump Performance**

Pump performance testing should be performed as necessary when significant pump improvements/modifications are made, such as new/rehabilitated impeller.

In evaluating the performance of a particular pump, the following indications or methods may be useful:

1. Comparison of elapsed time meter readings. A change in pump running times may indicate problems.
2. Position of check valve lever arm (where provided).
3. Movement of wet well level indicator.
4. Calibrated liquid filled pressure gage.
5. Amperage demand (where meter provided).

Prior to completing the pump performance testing below, the following should be completed/verified.

1. Verify performance test information with appropriate System Manager or Superintendent.
2. Contact the Data Analysis group a minimum of one (1) day prior to performing the test. Request that the data recording frequency be changed to 2-second or the minimum allowable by the recorder.

NOTE: Performance testing is for wet well pump stations ONLY. Procedures for performance testing of PRS pump stations is under development.

##### **5.8.9.1. Pump Performance Test – Using installed MMPS Flow Meter**

Pump performance testing should be performed for each pump upon completion of the Annual Pump PM.

- Determine flow, pressure and pump speed for test(s).
- Install pressure gauge on pump volute.
- Close individual pump discharge valve a minimum of 75 percent.
- Start pump in HAND and ramp up to desired speed.
- Check pressure gauge and OPEN/CLOSE discharge valve to reach desired pressure.
- Once desired pressure is achieved, run pump for a minimum of 30 seconds at the desired pressure and record the time.
- Shut off pump, return mode to AUTO and open discharge valve.
- Repeat for each installed pump.

#### **5.8.9.2. Pump Performance Test – Using Wet Well Volume**

Pump performance testing should be performed for each pump upon completion of the Annual Pump PM.

- Determine pump speed for test(s).
- Ensure sluice/slide gate or isolation valve is operational.
- Install pressure gauge on pump volute.
- Close individual pump discharge valve a minimum of 75 percent.
- Completely close sluice/slide gate or isolation valve. Note the wet well level.
- Start pump in HAND and ramp up to desired speed. Run pump at desired speed for 60 seconds recording the wet well level at the beginning and end of 60 second period. At approximately 30 seconds into test, record pressure from gauge on volute.
- If sluice/slide gate or isolation valve is inoperable or nonexistent, perform the following:
  - Test shall be performed when wet well level is at or below the influent invert elevation.
  - Upon pump shutting off, document the time and wet well level.
  - Allow wet well level to fill for approximately 5 minutes, at which point, the time and wet well level should be documented.
- Open sluice/slide gate or isolation valve, shut off pump, return mode to AUTO and open discharge valve.
- Repeat for each installed pump.
- Provide recorded information to appropriate supervisor.



#### **5.8.10. Variable Speed Units**

Variable speed units should be exercised and accomplished by operating the unit in manual mode and verifying its proper function through full range. Notify the appropriate Supervisor of any discrepancies.

#### **5.8.11. Seal Oil – Dry-Pit Submersible Pumps**

The following procedures are for the changing of Seal Oil for Dry-Pit Submersible Pumps in accordance with Form 5-11 and the Inspection Schedule. These procedures should also be followed if a Seal Fail Alarm has occurred.

1. Lock and Tag out pump.
2. Drain old oil from seal cavity by removing oil cavity inspection plug, then remove lower inspection plug. NOTE: USE CAUTION WHEN REMOVING PLUG, CAVITY MAY BE PRESSURIZED.
3. Complete oil drain with assistance from shop-vac.
4. Completely clean lower seal plug and O-ring and re-install on pump.
5. Fill seal oil cavity with required amount of manufacturer's approved oil.
6. Completely clean upper seal plug and O-ring and re-install on pump.
7. Remove Lock and Tag from pump and place unit back in service.

#### **5.9. /Temporary/Interim Pump**

Emergency/Temporary/Interim Pump(s) that are setup at a Pump Station are necessary to maintain reliable operation of the system. For winterization of pump(s), see Section 5.6 above.

##### **5.9.1. Weekly Inspection**

The following procedures shall be performed weekly in accordance with the Inspection Schedule.

1. Check oil, fuel and cooling fluid before starting test. Fuel level should be checked in accordance with Section 2.5, Diesel Fuel Storage Tanks.
2. Turn station pumps off.
3. Let the wet well level build until the emergency pump is called to operate by the bubbler, transducer or floats. Verify that the pump starts at the correct setting.
4. Once the pump starts, monitor the engine and oil temperature, battery voltage and RPMs.
5. Verify that the pump shuts off at the correct setting.
6. Turn station pumps on and verify that all pumps are primed and ready to operate.
7. Notify the appropriate supervisor immediately of any abnormalities.

##### **5.9.2. Maintenance**

Routine maintenance shall be performed in accordance with the manufacturer's recommendations or at a

minimum, annually.

## **5.10. Sump Pump**

Fill the sump basin and verify that the pump starts and stops automatically at the proper level. Visually inspect pump.

### **5.10.1. Monthly Inspection**

1. Pump all the water possible out of the basin. Remove electrical plug from the wall outlet.
2. Disconnect pump at the union, if provided, and remove from the basin.
3. Check strainer, bottom cover, etc. - clean unit of grease and other debris.
4. Check float for pin holes or wear spots.
5. Test the check valve by slowly opening the discharge gate valve. If water flows from the line, the check valve is faulty. In this case, close the gate valve and repair or replace the check valve as determined.
6. Clean the sump basin thoroughly and reinstall the pump.
7. Restore the pump to service by opening the discharge gate valve and reconnecting the electrical plug to the wall outlet.

Fill the sump basin until pump automatically starts and verify if operating properly.

## **5.11. Check Valves - General**

Check valves shall be visually inspected for proper operation in accordance with the Inspection Schedule. A back spinning pump or a whistling noise from a check valve is usually a reliable indicator of a malfunctioning check valve. If this condition is observed, the unit controls should be tagged out of service and the pump discharge valve closed to prevent recirculation of wastewater. This must be reported to the appropriate Supervisor as soon as possible.

### **5.11.1. Inspection**

During annual inspection, check valves are to be disassembled, as necessary, and the yoke, shaft, body, swing arm, disc, seats and key stock are to be cleaned and inspected for excessive wear.

### **5.11.2. Lever Arm**

Other problems that might be observed include weeping or dripping at the lever arm shaft. This condition is corrected by adjusting or repacking the lever arm shaft stuffing box or replacement of O-ring seals. The lever arm should be checked for slack or play. This would be indicative of worn keyway or missing (loose) set screw.

### **5.11.3. Hydraulic Check Valves**

Certain pump stations are equipped with hydraulic check valves. These valves should be inspected, adjusted (if needed), and serviced. This will include checking the fluid level in the hydraulic closure device, utilizing the appropriate safety procedures.

Any adjustments or repairs to these valves should be in accordance with the manufacturers' recommendations.

### **5.12. Suction and Discharge Isolation Valves**

All suction isolation valves and all discharge isolation valves should be completely exercised (closed and opened) to ensure that they do not become inoperative. A thin coat of grease should be kept on all open stems. Verify condition and operability of any installed chain/pulley systems for valve operation.

#### **5.12.1. Repacking**

Before repacking, verify the isolation valve is in the fully closed position. This will prevent excessive leaking when the packing is removed. Repack isolation valve in accordance with manufacturer's recommendations. The following is for repacking of gate valves.

1. Remove all packing from the stuffing box.
2. Clean valve stem with fine emery cloth.
3. Insert new split ring packing in the stuffing box, staggering the joints and tamping down while inserting.
4. Lubricate stem with a thin coat of grease and tighten down the packing just enough to keep from leaking.

### **5.13. Wet wells - General**

Particular attention should be paid to the state of cleanliness in all wet wells. Floors, walls, ceilings (where needed), sluice/slide gates, bar screens, hydraulic grinders, etc. should be washed down. When cleaning a wet well, check for any floating debris which might plug or damage a pump, and remove such debris.

#### **5.13.1. Cleaning Instructions**

1. Isolate influent. This should be accomplished with installed infrastructure at the PS (sluice/slide gate or isolation valve, etc.) or through the installation of temporary measures, such as a plug.
2. Use a hose and nozzle to wash the solids off the walls while the well is being pumped down. If solids are heavier than normal, pump out in stages. If water pressure does not remove the solids from the walls, the wet well walls must be scraped.
3. The scum build-up should be removed by scraping as needed and noted in the station log. The scraping should include all areas that can be reached - behind the bar screen and the rear side of the well (where an opening is available), as well as the sluice gate, steps, etc.
4. At the time of the cleaning, the accumulation of scum and rags on the bar screen should be removed.
5. In order to alleviate the build-up of scum and solids in the wet wells, all stations (where feasible) should be pumped down according to schedule (or as required) to their lowest level and back flushed as required. Ensure that pumps are re-primed after pump-down.
6. Visually check sand accumulation according to schedule. This can be performed during the Step 4 procedure.

### **5.13.2. Wet Well Isolation - Gate or Valve**

All gates or valves shall be exercised (closed and opened) monthly to ensure that they do not become inoperable. Gate will be either sluice or slide type. Valve may be gate or plug type.

For sluice/slide gate, a thick coat of grease should be kept on the stems and tracks. In the case of large pumping stations, if it is not feasible to completely close the sluice gate, operate these gates as far down as possible without causing operational problems. During operation of sluice/slide gate, observe stem in wet well to ensure that it is not bending. The guides and wedges should be checked for proper operation. Check for areas around the gate where water is leaking by and make the appropriate adjustments

For an isolation valve, refer to Section 3.3.

### **5.13.3. Bar Screens**

Bar screens are installed to prevent large debris from entering and plugging or damaging a pump. The screens should be cleaned to ensure that there is no substantial restriction of wastewater flow to the pumps.

The cleaning is accomplished with a forked tool (rake) or any type tool capable of picking up and removing debris from the bar screen. Note the condition of the screen during each cleaning.

Particular attention should be paid to the state of cleanliness in all pump stations. Rags containing oil, grease, etc., should be properly disposed of immediately after use. All housekeeping duties should be performed on an "as needed" basis.

## **5.14. Hydraulic Grinders**

### **5.14.1. Hydraulic Power Pack**

1. Maintain correct fluid level by ensuring hydraulic fluid is between the high level and low level marks on the sight glass.
2. Fluid should be changed every 12 months by opening the drain plug at the bottom of the tank after the HPP has been shut down. Discard all drained fluid and replace with fresh uncontaminated fluid.
3. The HPP replaceable canister type filter on the return line should be changed when the filter indicator pops up.
4. The suction strainer should be cleaned as necessary. If the strainer is damaged or cannot be thoroughly cleaned, replacement is recommended.

### **5.14.2. Grinder**

1. The grinder should be visually inspected during each visit to the station. The inspection should include smoothness of operation, noise, stuck debris, any signs of damage, or signs of excessive wear.
2. The grinder should be inspected yearly (or as required by manufacture's recommendation) during station PM by locking and tagging out the grinder and removing the grinder from the channel to inspect the following:
  - a. Screen Drum Inspection – Remove any buildup of debris. After cleaning, check the screen drum for dents, damage, or uneven rotation of the drum.

- b. Cutter Wear – Check the grinder cutters for wear. Worn cutters should be replaced if the size of the reduced solids becomes unacceptable or the grinder jams excessively.
- c. Cutter Stack Tightness – Check cutter stack tightness by inserting a long screwdriver in between adjacent cutters on each shaft and moving the tool forward and back. Verify that none of the cutters or spacers shift along the shaft axis when pushed. If any of the cutters or spacers shift along the axis, the cutters are loose and must be removed, cleaned, and restacked.
- d. Intermediate Shaft Support Inspection – Verify the cutter shaft support housing fits snugly with a small amount of free movement and does not overheat during normal operation. Replace the shaft support if any uneven wear or excessive tightness is noted.
- e. Grease Gears – The drive and driven gears in the top end housing are greased as part of the inspection.

### **5.15. Housekeeping - General**

Below is a typical Interceptor Technician's list of general housekeeping duties:

1. Floors should be kept free of grease, oil, etc., swept and/or mopped down as needed. Trash containers should be emptied.
2. Walls should be kept free of grease, oil, etc., and washed down (if feasible) as needed. Particular attention should be paid to walls within the pump rooms.
3. Stairways (including handrails, landings, etc.) should be kept clear at all times, swept and/or washed as needed.
4. Windows should be washed; sills, frames, etc., dusted as needed.
5. Doors should be kept free of dirt, grease, etc. Telltale signs of maintenance such as fingerprints and/or handprints shall be removed.
6. All spare parts stored in each station should be tagged with the appropriate information; the cabinets and/or storage racks shall be kept neat and orderly (see safe work practices).
7. The following items of equipment should be kept free of grease, oil, etc., wiped and/or dusted as needed:
  - a. Air compressors - exterior surface.
  - b. Control panels - exterior surface.
  - c. Motors - exterior surface.
  - d. Pumps - exterior surface, including suction / discharge lines, gate valves, check valves, etc.
8. Bulletin boards and/or chalk boards should be maintained and kept current; include all applicable station logs and other posted information.
9. Toilet facilities should be kept clean and serviced; include all sinks, commodes, soap and towel dispensers, mirrors, etc.

*Note: Exercise caution when mopping the motor room floor; ensure that water does not lie dormant beneath the electrical control panel or at the base of the panel. As a rust preventive, keep a thin coat of grease on those shafting components that do not require painting. To avoid damage to pump bearings, do not hose down above stuffing box of pumps.*

## **5.16. Shaft Guards and Safety Chains**

### **5.16.1. Shaft Guards, Shields, and Cages**

Shaft guards or cages are required around all revolving shafts up to a point seven feet above the floor or platform surface. Their purpose is to prevent personnel and their clothing or equipment from coming in contact with the revolving shaft.

Shaft guard enclosures are usually constructed of light angle-iron frames covered with expanded metal. Hinged handholes may be provided in the guards to allow access to the shafting components for lubrication and inspection. Shaft guards should be painted safety yellow and should be inspected for general condition.

### **5.16.2. Safety Chains and Ropes**

Safety chains or ropes are normally provided as a safety device around floor openings where frequent access is required and it is not feasible to provide rigid rails. They are constructed of 3/16" chain or heavy nylon rope, utilizing Halyard-snap ends.

Safety chains / ropes should be carefully inspected according to frequency schedule and should be replaced immediately if there are any signs of deterioration or failure.

*Form 5-1. Typical Daily Pump Station Report*

**PUMP STATION DAILY REPORT**

PUMP STATION	IN	OUT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

1. Wet Well Fan	6. Pumps	11. Sump Pump	16. General Appearance
2. Barscreen/Grinder	7. Bleed Line	12. Run Time Clock	
3. Panel Lights	8. Shafting	13. Generator	
4. Purge System	9. Bearing Noise	14. Housekeeping	
5. Air Compressor	10. Packing Gland	15. Temporary/Interim Pump	

REMARKS:

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_



Form 5-2. Typical North Shore Weekly Pump Station Report

**PUMP STATION WEEKLY REPORT**

PUMP STATION	1	2	3	4	5	6	7	8	9	10
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										

1. Wet Well

2. Check Light Fixtures

3. Transfer Leads

4. Check Tide Gate

5. Exercise Pumps

6. Landscaping

7. Pipe and Equipment

8. Air Compressor - Bleed

9. Generator Cooling System

10. Pressure Sensor/Transducer

REMARKS:

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

PUMP STATION MONTHLY REPORT

PUMP STATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								

1. Sump Pump Inspection

2. Alarm Test

3. Autocon Inspection

4. Ladders

5. Wet Well Inspection
6. Operate Sluice Gate

7. Variable Speed Test

8. Check Valve Inspection

9. First Aid Kit

10. Fire Extinguisher(s)
11. Eyewash Station(s)

12. Back Flow Preventer

13. Signs

14. MSDS Book(s)

15. Emergency Lighting
16. Staircase

17. Paint (Touch Up)

18. Chains

19. Hoist(s)

20. Hatches
21. Guards - Rotating Devices

22. Shaft Guards

23. Grating

24. Guard Rails

REMARKS:

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

Form 5-5. Typical Valve Inspection Report

# SEMI-ANNUAL VALVE INSPECTION REPORT

		PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4
PS NAME	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
REMARKS:					

Form 5-6. Typical Annual Pump Inspection Report

## ANNUAL PUMP INSPECTION REPORT

DATE:		PUMP NO.:	
PUMP STATION:		CLOCK READING:	
CMMS WO NO:		CMMS WO TYPE:	

COMMENTS: Indicate conditions of inspection items as VERY GOOD, GOOD, FAIR, POOR or NEEDS REPAIR (NR).

PUMP TYPE:		CHECK VALVE	
PUMP FRAME:		CONDITION:	
SUCTION VALVE:		YOKE:	
DISCHARGE VALVE:		SEAT:	
TOP BEARING:		DISC:	
BOTTOM BEARING:		O-RINGS/PACKING:	

IMPELLER		NOSE RING	
CONDITION:		CONDITION:	
LENGTH:		OD:	
DIAMETER:		ID:	
		THICKNESS:	

VOLUTE		BASE RING	
CONDITION:		CONDITION:	
DEPTH:		OD:	
DEVCON:		ID:	
COATING:		THICKNESS:	

CLEARANCE		STUFFING BOX	
CONDITION:		CONDITION:	
GASKET MATERIAL:		PACKING GLAND CONDITION:	
GASKET THICKNESS:		SLEEVE CONDITION:	
METAL TO METAL:		PACKING INSTALLED:	
SHIM THICKNESS:		PACKING NEEDED:	

\*This is an example of CMMS Checklist.

REMARKS:

SIGNATURE:

\_\_\_\_\_

## ANNUAL PUMP STATION WET WELL INSPECTION REPORT - BELOW GRADE

DATE/TIME:	WALL COATING SYSTEM TYPE:	
INSPECTOR:	COATING CONDITION:	
PUMP STATION:	SURFACE pH, LOCATION:	
PUMP STATION NO.:	SAND DEPTH (inches):	
PRE-CLEANED PRIOR TO INSPECTION:	DECK MATERIAL:	
ODOR CONTROL SYSTEM TYPE:	STAIR/LADDER CONDITION:	
VENTILATION SYSTEM CONDITION	(Yes, No)	

COMMENTS: Indicate conditions of inspection items as VERY GOOD, GOOD, FAIR, POOR or NEEDS REPAIR (NR). Directional indications are to be determined by the PS valve guide directional positioning. Type of Wall Coating System include: T-Lock, Epoxy, Grout, None, etc. Type of Odor Control System include: Scrubber, Carbon, Liqui-Fog, Ozone, None, etc.

	NORTH WALL	EAST WALL	SOUTH WALL	WEST WALL
Condition:				
Depth of Corrosion:				
Visible Defects:				
Visible Aggregate:				
Visible Cracks:				

	CEILING	INTERMEDIATE DECK	INFLUENT CHANNEL	OTHER
Condition:				
Depth of Corrosion:				
Visible Defects:				
Visible Aggregate:				

Visible Cracks:			
	SLUICE GATE		VALVE
Structure Condition:			
Operability:			
Ability to isolate flow:			
Visible Aggregate:			
Visible Cracks:			
REMARKS:			

ANNUAL PUMP STATION WET WELL INSPECTION REPORT - ABOVE GRADE

DATE/TIME:		ODOR CONTROL SYSTEM:	
INSPECTOR:		WALL COATING SYSTEM:	
PUMP STATION:		COATING CONDITION:	
PUMP STATION NO.:		SURFACE pH, LOCATION:	
		FLOOR MATERIAL:	
		STAIR/LADDER CONDITION:	

COMMENTS: Indicate conditions of inspection items as **GOOD, FAIR, POOR or NEEDS REPAIR (NR)**. Directional indications are to be determined by the PS valve guide directional positioning. Type of Wall Coating System include: **T-Lock, Grout, None, etc.** Type of Odor Control System include: **Scrubber, Carbon, Liqui-Fog, Ozone, None, etc.**

	NORTH WALL	EAST WALL	SOUTH WALL	WEST WALL
Condition:				
Depth of Corrosion:				
Visible Defects:				
Visible Aggregate:				
Visible Cracks:				

	CEILING	FLOOR	OTHER
Condition:			
Depth of Corrosion:			
Visible Defects:			
Visible Aggregate:			
Visible Cracks:			

REMARKS:	
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**WEEKLY TEMPORARY/INTERIM PUMP REPORT**

<b>PUMP NUMBER:</b>		<b>LOCATION:</b>	
<b>HOOR METER:</b>		<b>FUEL ON HAND:</b>	

Indicate work performed with **INITIALS** and discrepancies with a **X**.  
All discrepancies and any corrective action taken should be noted in REMARKS.

	<b>ENGINE OIL</b>		<b>BELTS</b>
	<b>FUEL TANK</b>		<b>HOSES</b>
	<b>RADIATOR COOLANT</b>		<b>PRIMEGUARD OPERATION</b>
	<b>BATTERY FLUID</b>		<b>PUMP PIPING</b>
	<b>BATTERY CHARGER</b>		<b>TIRE PRESSURE</b>

REMARKS:

**SIGNATURE:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

*Form 5-10. Typical Pump Lubrication Report*

**PUMP LUBRICATION REPORT**

PUMP STATION	DATE	PUMP HOURS			
		NO. 1	NO. 2	NO. 3	NO. 4

REMARKS:

**NOTE: LUBRICATE PUMPS, PILLOW BLOCK BEARINGS AND U-JOINTS**

## SEAL OIL PREVENTATIVE MAINTENANCE REPORT

		PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4
PS NAME	DATE:				
	HOURS:				
	WATER IN OIL:				
	DATE:				
	HOURS:				
	WATER IN OIL:				
	DATE:				
	HOURS:				
	WATER IN OIL:				
	DATE:				
	HOURS:				
	WATER IN OIL:				

### PROCEDURES:

1. Lock and Tag out pump.
2. Drain old oil from seal cavity by removing oil cavity inspection plug, then remove lower inspection plug. USE CAUTION WHEN REMOVING PLUG, CAVITY MAY BE PRESSURIZED
3. Complete oil drain with assistance from shop-vac.
4. Completely clean lower seal plug and o-ring and re-install on pump.
5. Fill seal oil cavity with required amount of oil (**ISO 32 FOOD MACHINERY OIL**).
6. Completely clean upper seal plug and o-ring and re-install on pump.
7. Remove Lock and Tag from pump and place unit back in service.

### REMARKS:

**PUMP STATION BUILDING INSPECTION REPORT**

DATE \_\_\_\_\_

PS \_\_\_\_\_

WO# \_\_\_\_\_

EXTERIOR					
SECTION	DESCRIPTION	GOOD	FAIR	POOR	COMMENTS
1.2	General Appearance				
1.2.1	Walls				
1.2.2	Roofing (visual from ground level only)				
1.2.3	Chimney, Vents and Flashing				
1.2.4	Gutters and Downspouts				
1.2.5	Louvers, Screens and Grills				
1.2.6	Steps, Hatches and Rails				
1.2.7	Doors, Windows and Trim				
1.2.8	Emergency Signage				
1.2.9	Fences, Gates and Driveway Barriers				
1.2.10	Walks and Driveways				
	Vaults and Chambers				
	Manhole Covers and Valve Boxes				

INTERIOR					
SECTION	DESCRIPTION	GOOD	FAIR	POOR	COMMENTS
1.3	General Appearance				
1.3.1	Walls, Ceilings and Floors				
1.3.2	Steps, Rails and Platforms				
1.3.3	Ventilation Ductwork				
1.3.4	Doors, Windows and Trim				
	Safety Signs, Tags, Labels				
	Pumps				
	Piping				

	Valves				
	Bathroom				
	Painting				
	Wet Well Appearance				
	Wet Well Condition				
	Wet Well Appurtenances				

**SIGNED** \_\_\_\_\_  
 \_\_\_\_\_

Form 5-13. Typical Hydraulic Grinder Inspection Report

# HYDRAULIC GRINDER INSPECTION REPORT

<b>DATE:</b>			
<b>PUMP STATION:</b>			

COMMENTS: Indicate conditions of inspection items as **GOOD, FAIR, POOR or NEEDS REPAIR (NR)**.

<b>HYDR. POWER PACK</b>			
LEAKS:			
CHANGE FILTER:			
CHANGE FLUID:			
CLEAN SCREEN:			

<b>SCREEN DRUM</b>		<b>CUTTERS</b>	
CONDITION:		CONDITION:	
DENTS:		WEAR:	
DAMAGE:		TIGHTNESS:	
ROTATION:			

<b>INT. SHAFT SUPPORTS</b>		<b>BEARINGS AND SEALS</b>	
CONDITION:		CONDITION:	
WEAR:		LEAKAGE:	
GREASE FITTINGS:		NOISE:	

<b>GEARS</b>		<b>DRIVE ASSEMBLY</b>	
REFER TO MANUAL:		VIBRATION:	
		NOISE:	
		HEAT BUILD UP:	
		GREASE SEEPAGE:	

REMARKS:

**SIGNATURE:** \_\_\_\_\_

Form 5-14. Pump Station Inspection Schedule

Interceptor Systems Preventive Maintenance

Inspection Schedule

Item	Daily*	Weekly	Monthly	Quarterly	Semi-Annually	Annually	Other
<b>Air Compressor</b>							
Air Filters – Check		X					
Bubble Line - Check	X						
Clean Unit			X				
Change Leads		X					
Condensate - Drain		X					
Oper. Controls – Check	X						
Pet Cocks - Check	X						
Purge – Manual	X						
Safety Valve - Test			X				
Settings – Test			X				
AUTOCON/Float Ball – Check			X				
Dehumidifier – Check		X					
<b>Backflow Preventer</b>							
Visual Inspection	X						
Clean Strainer							As Required
Test						X <sup>(FM)</sup>	
<b>Valves</b>							
Check Valves – Visual Inspection	X						
Isolation Valves - Exercise					X		
<b>General</b>							
Cold Weather Prep						X	
Hot Weather Prep						X	
Housekeeping	X						



Item	Daily*	Weekly	Monthly	Quarterly	Semi-Annually	Annually	Other
<b>Pumps</b>							
Alternate Leads			X				
Annual Pump Inspection (see form)						X	
Lubrication				X			
Packing Glands – Check	X						
Seal Oil					X		
Emergency Pump	X						
Shafting – Check	X						
Variable Speed Units - Exercise		X					
Safety Chains/Ropes Inspection			X <sup>(I)</sup>			X <sup>(S)</sup>	
Shaft Guards - Inspection						X	
Pump Performance Testing							Every 3 years or as required
<b>Emergency/Temp./Interim Pump - Test</b>		X					
<b>Sump Pumps</b>							
Visual Inspection	X						
Test & Service		X					
<b>Wet wells</b>							
Annual Wet Well Inspection						X	
Bar Screen – Clean	X						
Hydraulic Grinder - Check	X						
Hydraulic Grinder – Inspection						X	
Clean Well							As Needed
Check for Sand			X				
Wet Well Isolation Gate/Valve - Exercise			X				

\* During each station check by Interceptor Technician.

I – Interceptors; FM – Facilities Maintenance; S - Safety

## **6. ALARM SYSTEM**

Typical alarm test reports used by Interceptor Operations are included as Form 6-1. The alarm test schedule is on Form 6-2.

### **6.1. General**

Interceptor Operations utilizes two different systems for alarming purposes. System alarms are primarily transmitted via the Telog system and Pump Station alarms are primarily transmitted through the SCADA system. However, a few System alarms and Pump Station alarms are also transmitted through the other system.

The Telog system consists of a Telog server which communicates with remote Telog Data Recorders via cellular modems. This system is typically used for analog data recorded at Master Metering Sites, PSs, and other locations where SCADA system units are not installed.

The SCADA (Supervisory Control And Data Acquisition) system is currently comprised of two (2) independent systems. The legacy SCADA system consists of a MOSCAD FEP (Front End Processor), RTU (Remote Terminal Unit) and Intellution iFix System. The system has the capability of collecting a wide range of data on site and then transmitting via radio to a remote FEP, typically installed at an HRSD WWTP. From there, a connection to a TLS circuit (Ethernet) is made and the data is forwarded to the primary control FEP. The data is then “pushed” to the two (2) backup FEP nodes at the North Shore and South Shore Interceptor Operations. In the event of a failure at the primary FEP, the control switches to one of the other two FEPs. The FEPs are then interrogated by the MMI interpretation software Fix Dmacs for data and alarm processing. The FEP also pushes the data via a MODBUS interface to the Intellution iFix SCADA System, which is used to send alarms to the WIN911 Paging system. The iFix also feeds the EDS Server, which is used for historical archiving.

The new SCADA Alarm System is being deployed with Emerson’s Ovation SCADA system and is currently in the implementation and installation stage. Approximately ½ of HRSD’s remotes sites are currently using the new system. As sites are cut over to the new Ovation SCADA system, they are removed from the legacy iFix system to avoid duplication of alarms and data. The new Ovation SCADA system consists of local ControlWave PLCs for process control of the facility through a Maple graphics OIT. These controllers operate the station locally with operator adjustable parameters. If communications failures occur, these PLCs also run independent of the Top-End system and continue operations locally until communications are restored. All local sites are outfitted with CISCO routers that communicate to the Top-End system through the Verizon Wireless 4G network. Some local sites are also equipped with CISCO switches that communicate and connect the PLC to local equipment (e.g. VFD’s, Godwin Pumps, etc.).

The Top-End SCADA Ovation system consists of 3 Ovation Server systems located within the server rooms at South Shore, North Shore, and Small Communities. Each Top-End Server System is equipped and connected to a Verizon PIP router that communicates through the 4G network to the remote sites. When communications are available, every operating parameter that is available locally at the ControlWave PLC is also available at the Top-End. This includes all data and all control features. All remote operations are done through the Ovation SCADA software programmed with interfaces and graphics that exactly mirror the local OIT graphics. The Ovation Top-End system is also connected to a Win911 paging system that allows for notification of alarm conditions via paging, texts, and email. A hierarchy of user permissions through standard Window active directory is used to assign rights and privileges to user access and allow read-only, operator, supervisor, and administrative commands to all controls, alarming, and programming. DMP3 communications protocols are used between the PLC & Top-End SCADA servers with BSAP backup during periods of communications loss. Networking is done via standard TCP/IP with device IP

CID519999\_HRSD\_CFPF-2\_BCAREport

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

Supporting Information – Projects – Benefit-Cost Analysis

*A benefit-cost analysis must be submitted with the project application.*

Attached is the benefit-cost analysis for Dozier's Corner Pump Station Replacement using the FEMA Benefit-Cost Calculator V.6.0.



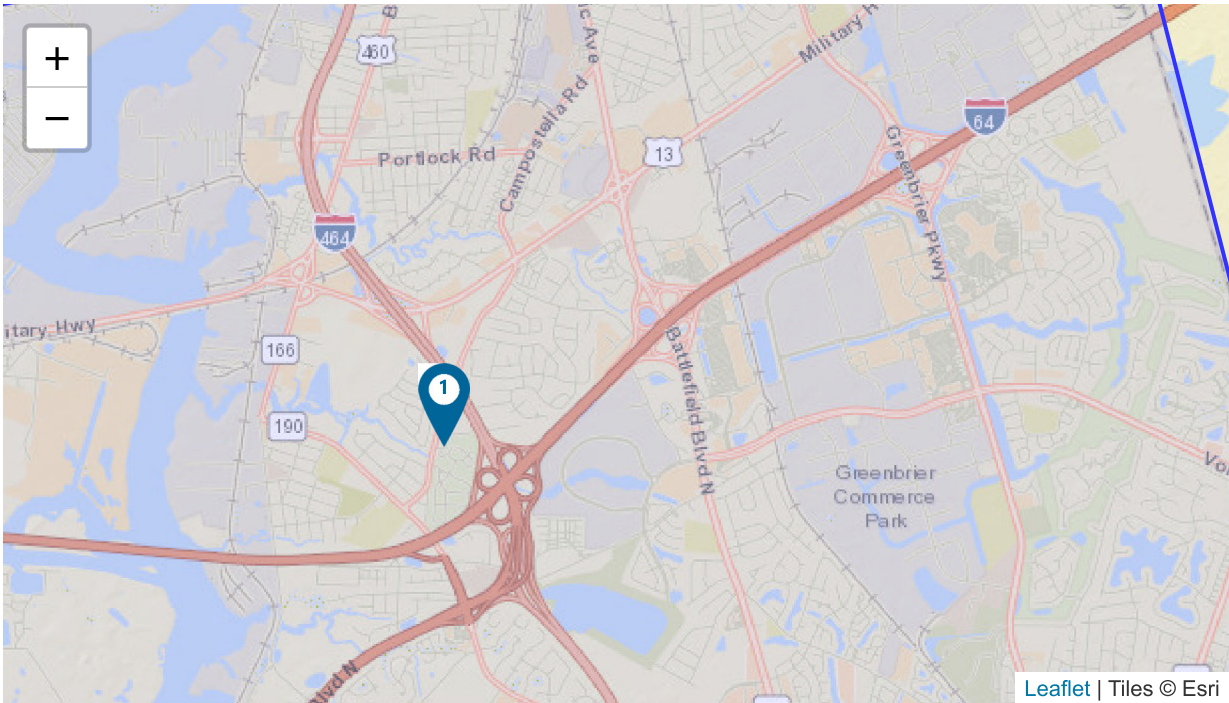
FEMA


Benefit-Cost Calculator

V.6.0 (Build 20241018.1218 | Release Notes)

Benefit-Cost Analysis

Project Name: Dozier's Corner Pump Station Replacement



Map Marker ▲	Mitigation Title	Property Type	Hazard	Discount Rate (%)	Benefits (B)	Costs (C)	BCR (B/C)
1	Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320		DFA - Coastal A Flood	3.1	\$ 11,158,449	\$ 8,437,638	1.32
TOTAL (SELECTED)					\$ 11,158,449	\$ 8,437,638	1.32
TOTAL					\$ 11,158,449	\$ 8,437,638	1.32

Property Configuration

Property Title:	Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320
Property Location:	23320, Chesapeake, Virginia
Property Coordinates:	36.76538061003181, -76.27336914481734
Hazard Type:	Coastal A Flood
Mitigation Action Type:	Elevation
Property Type:	Utilities
Analysis Method Type:	Professional Expected Damages

Cost Estimation

Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

Discount Rate (%):	3.1%	Use Default:Yes
Project Useful Life (years):	50	
Project Cost:	\$7,872,329	
Number of Maintenance Years:	50	Use Default:Yes
Annual Maintenance Cost:	\$22,390	

Comments

•

Project Useful Life:

A pump station contains multiple elements with a wide variety of service lives. For simplicity, a pump station building is financially depreciated over a 30 year service life horizon according to HRSD's financial policy (see PROCEDURE Renewal Planning Model Treatment, PS, FM, Gravity Sections 7.1 & 7.2). In practice, all HRSD facilities are in constant stages of condition assessment and maintenance to extend service life appropriately. Therefore, while a pump station may need additional capital investment within a 30 year horizon, this investment rarely would rise to the level of complete facility replacement as scoped in the subject project. For example, the existing facility is 64 years old, therefore we have chosen to utilize the FEMA default value of 50 years as a conservative estimate.

•

Mitigation Project Cost:

The initial project cost is \$7,872,329. This includes the PER (\$196,495), design (\$829,869), property acquisition (\$590,000), pre-construction (\$31,124), and construction (\$6,224,841). The construction costs include contingency and escalation in accordance with AACE International Class 5 categorization.

•

Annual Maintenance Cost:

Annual maintenance is based on the maintenance costs for the existing Dozier’s Corner, not counting power or fuel for the bypass pump. The total from 1/1/2020 to date is \$111,952.38, averaging roughly \$22,390.48/yr. Use \$22,390 for BCA. This estimate is likely higher than what we would expect to spend on the new facility which will predominantly be proactive maintenance as opposed to both proactive and reactive maintenance needed for a facility at the end of its useful life.

Damage Analysis Parameters - Damage Frequency Assessment	
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320	
Year of Analysis was Conducted:	2023
Year Property was Built:	1960
Analysis Duration:	64    Use Default:Yes

Comments

•

Analysis Year:

Refer to final report date of May 2023 for "Flood Risk in a Changing Climate" report.

Utilities Properties  
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

Type of Service:	Wastewater
Number of Customers Served:	3,106
Value of Unit of Service (\$/person/day):	\$71    Use Default:Yes
Total Value of Service Per Day (\$/day):	\$220,526

Comments

- 

Type of Service:

HRSD is the only public provider of wastewater treatment service in Hampton Roads. HRSD assets include treatment plants, pump stations, and pipelines. <https://www.hrsd.com/about-us>

- 

Number of Customers Served:

Reference "Pumping Station Vulnerability Assessment" Section 3.1.4 for population served estimate methodology. Value entered is found in the CCPS\_PS\_PRS\_VA\_Inputs\_Master\_20230515.xlsx excel file Sheet "7 Population Served" cell B49

Professional Expected Damages Before Mitigation  
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

	WASTEWATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Temp Equipment Rental (\$)	Repairs (\$)	Emergency Equipment (\$)	Number of Volunteers	Number of Days	Damages (\$)
10	14	32,600	1,370,616	0	0	0	4,490,580
100	14	32,600	1,370,616	0	0	0	4,490,580
500	14	32,600	1,370,616	150,000	0	0	4,640,580

## Comments

- 

### Damages Before Mitigation:

Insuring this facility can withstand a 100 year flood event is a specific requirement of HRSD's EPA Federal Consent Decree. Reference "Pumping Facility Vulnerability Assessment" pp. 78, Slide 54 showing existing critical elevations and the flooding elevations of various recurrence intervals for Dozier's Corner Pump Station. The lowest point of entry (LPE) of the building is 5.6 ft NAVD88. Once the water level exceeds this elevation damage to the facility would begin to occur. In the 100 year recurrence event, the same damage would occur with the addition of the elevated emergency equipment valued at \$150,000. Value entered is found in the CCPS\_PS\_PRS\_VA\_Inputs\_Master\_20230515.xlsx excel file Sheet "9

VulnerabilityAssessmentInputs" cell AG56. Reference "Pumping Facility Vulnerability Assessment" pp. 18, Section 3.4.1 for days the facility would be impacted. The existing pumps are not submersible, therefore use 14 days where the pumping facility will be offline. Reference "Pumping Facility Vulnerability Assessment" pp. 125, Appendix F for temporary equipment rental. Dozier's Corner PS is classified as a small unique (decoupled) pump station therefore we use Hilton School PS as the representative facility. One time setup cost of \$2,000 plus 9 months of equipment rental at \$3,400/month gives a total of \$32,600. Repair costs include replacement of critical building and electrical assets. Value entered is found in the CCPS\_PS\_PRS\_VA\_Inputs\_Master\_20230515.xlsx excel file Sheet "9 VulnerabilityAssessmentInputs" sum of cells V41 and O41. FEMA Base Flood Elevation is 8 ft.

#### Annualized Damages Before Mitigation

Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

Annualized Recurrence Interval (years)	Damages and Losses (\$)	Annualized Damages and Losses (\$)
10	4,490,580	404,152
100	4,490,580	36,520
500	4,640,580	9,281
	Sum Damages and Losses (\$)	Sum Annualized Damages and Losses (\$)
	13,621,740	449,953

#### Professional Expected Damages After Mitigation

Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320

	WASTEWATER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Impact (days)	Temp Equipment Rental (\$)	Repairs (\$)	Emergency Equipment (\$)	Number of Volunteers	Number of Days	Damages (\$)
100	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
501	14	32,600	890,000	0	0	0	4,009,964



Comments

•

Damages After Mitigation:

Replacement pump station facility will be fully protected for the 100 year flood recurrence event as required by HRSD's EPA Federal Consent Decree. Facility design is currently in the preliminary engineering phase but shall withstand the 100 year flooding event. An event of this magnitude would completely inundate the majority of the service area of this facility as shown with LiDar data "Layout\_DozierCornerPS\_ServiceArea\_Elevation.pdf". This data also shows that even in the 100 year event the planned Dozier’s Corner PS would be one of very few facilities to survive such an event. Repair costs include replacement of electrical assets. Value entered is found in the CCPS\_PS\_PRS\_VA\_Inputs\_Master\_20230515.xlsx excel file Sheet "9 VulnerabilityAssessmentInputs" cell AO41. FEMA Base Flood Elevation is 8 ft. The 500-year flood elevation for these structures is estimated at 10 feet per the FEMA NFIP building codes. The 500-year elevation is calculated using the FEMA Technical Fact Sheet 1.6 which states the elevation for the 500-year flood event in a coastal flood hazard area can be approximated by multiplying the elevation of the 100 year BFE by 1.25 (8' \* 1.25 = 10'). The American Society of Civil Engineers (ASCE), Flood Resistant Design and Construction, also identifies flood design elevations for coastal high hazard areas as BFE + 2 feet, or 500-year flood elevation, whichever is higher. In this case both criteria result in a 10' elevation. Based on the calculations provided above, The HRSD proposal for an 11-foot elevation meets or exceed the criteria for the 500-year elevation.

Annualized Damages After Mitigation		
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320		
Annualized Recurrence Interval (years)	Damages and Losses (\$)	Annualized Damages and Losses (\$)
10	0	0
100	0	0
500	0	0
501	4,009,964	8,004
	Sum Damages and Losses (\$)	Sum Annualized Damages and Losses (\$)
	4,009,964	8,004

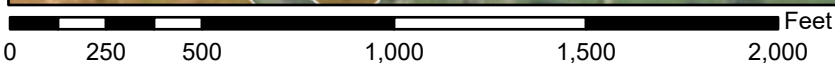
Benefits-Costs Summary		
Elevation @ 1109 Keats St, Chesapeake, Virginia, 23320		
Discount Rate (%):	3.1%	Use Default:Yes
Total Standard Mitigation Benefits:	\$11,158,449	
Total Social Benefits:	\$0	
Total Mitigation Project Benefits:	\$11,158,449	
Total Mitigation Project Cost:	\$8,437,638	
Benefit Cost Ratio - Standard:	1.32	
Benefit Cost Ratio - Standard + Social:	1.32	

# National Flood Hazard Layer FIRMette

1109 Keats Street, Chesapeake, VA 23320



76°16'43"W 36°46'8"N



1:6,000

76°16'5"W 36°45'39"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/1/2024 at 4:19 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

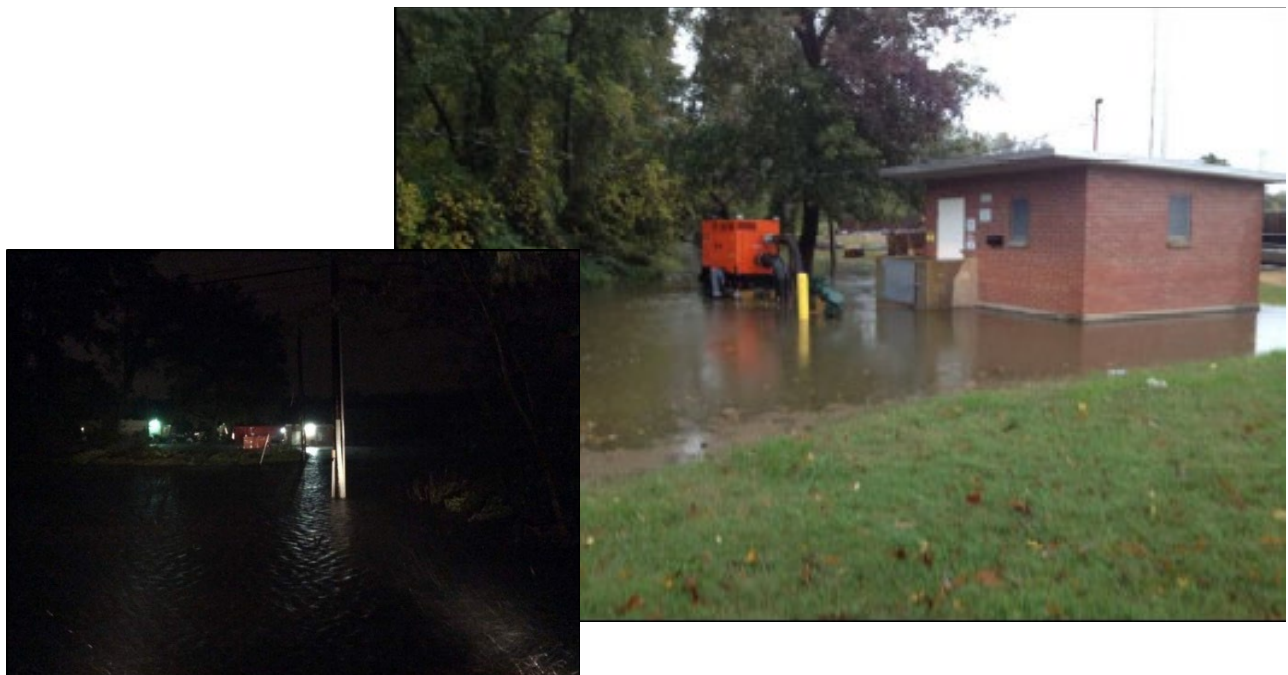
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



CID519999\_HRSD\_CFPF-2\_FloodImages  
Applicant: Hampton Roads Sanitation District  
Project: Dozier's Corner Pump Station Replacement



Flooding observed at Dozier's Corner Pump Station on December 17, 2023.



Flooding observed at Dozier's Corner Pump Station during Super Storm Sandy on October 29, 2012.

CID519999\_HRSD\_CFPF-2\_FloodplainOrdinance

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

Supporting Documentation - Floodplain Ordinance

*A link to or a copy of the current floodplain ordinance.*

The HRSD Dozier's Corner Pump Station project is in the City of Chesapeake and serves City residents and businesses. Attached is the City of Chesapeake's floodplain ordinance, corrected version 10/21/2014.

**CORRECTED VERSION 10/21/2014**

**AN ORDINANCE AMENDING CHAPTER 26 OF THE CHESAPEAKE CITY CODE, ENTITLED "ENVIRONMENT," ARTICLE IV, FLOODPLAIN MANAGEMENT, BY AMENDING SECTIONS 26-86, 26-88, 26-94, 26-99, AND 26-100 THEREOF TO MODIFY AND CLARIFY DEFINITIONS, ADOPT A NEW FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM), AND REQUIRE FLOOD ELEVATION CERTIFICATES FOR RESIDENTIAL AND COMMERCIAL STRUCTURES.**

BE IT ORDAINED by the Council of the City of Chesapeake, Virginia, that Article IV of Chapter 26 of the Chesapeake City Code, Sections 26-86, 26-88, 26-94, 26-99, and 26-100 be amended and reenacted as set out below:

**ARTICLE IV – FLOODPLAIN MANAGEMENT**

**Sec. 26-86. Statutory Authorization, Purpose and Intent**

This article is adopted pursuant to the authority granted to localities by Virginia Code § 15.2-2280. The purpose of these provisions is to prevent: the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base by:

- (1) Regulating uses, activities, and development which, alone or in combination with other existing or future uses, activities, and development, will cause unacceptable increases in flood heights, velocities, and frequencies;
- (2) Restricting or prohibiting certain uses, activities, and development from locating within districts subject to flooding;
- (3) Requiring all those uses, activities, and developments that do occur in flood-

prone districts to be protected and/or flood-proofed against flooding and flood damage;

- (4) Protecting individuals from buying land and structures which are unsuited for intended purposes because of flood hazards; and
- (5) Acknowledgement that the tide data over the last 100 years clearly shows that Chesapeake has been facing an escalating danger from both sea level rise and subsidence.

#### **Sec. 26-88. Definitions**

*Base flood* (or *100-year flood*) means the flood having a one percent chance of being equaled or exceeded in any given year.

*Base flood elevation (BFE)* means the Federal Emergency Management Agency (FEMA) designated 100-year water surface elevation. The water surface elevation of the base flood in relation to the datum specified on the community's flood insurance rate map. For the purposes of this ordinance, the 100-year flood or one percent annual chance flood.

*Basement* means any area of the building having its floor sub-grade (below ground level) on all sides.

*Board* means the local board of building code appeals.

*Community* means the City of Chesapeake, unless otherwise indicated.

*Critical infrastructure* fall within the following categories:

- (1) *Governmental facilities*: Essential for the delivery of critical services and crisis management, including data and communication centers, key government complexes, and similar facilities as determined by the floodplain administrator.
- (2) *Essential facilities*: Those that are vital to health and welfare of entire populations, including hospitals and other medical facilities, retirement homes, police and fire facilities, emergency operations centers, prisons, evacuation shelters, and schools, and similar facilities as determined by the floodplain administrator.
- (3) *Transportation systems*: Those systems, and the supporting infrastructure, necessary for transport of people and resources (including airports, highways, railways, and waterways) during major disasters, including flood events up to the 500-year flood.
- (4) *Lifeline utility systems*: Those vital to public health and safety, including potable water, wastewater, oil, natural gas, electric power, communication systems, and similar facilities as determined by the floodplain administrator .
- (5) *High potential loss facilities*: Failure or disruption of operations may have



significant physical, social, environmental, and/or economic impact to neighboring communities, including nuclear power plants, high-hazard dams, urban levees, and military installations.

(6) *Hazardous material facilities*: Involved in the production, storage, and/or transport of corrosives, explosives, flammable materials, radioactive materials, toxins, and similar facilities as determined by the floodplain administrator.

*Development* means any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

*Elevated building* means a non-basement building built to have the lowest floor elevated above the ground level by means of fill, solid foundation perimeter walls, pilings, or columns (posts and piers).

*Enclosed area* means the enclosed walled-in areas below the lowest floor of an elevated building.

*Encroachment* means the advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or development into a floodplain, which may impede or alter the flow capacity of a floodplain.

*Fill or filling* means any depositing or stockpiling of earth materials to raise or alter the

elevation of land.

*Flood or flooding* means:

- (1) A general or temporary condition of partial or complete inundation of normally dry land areas from:
  - a. The overflow of inland or tidal waters;
  - b. The unusual and rapid accumulation or runoff of surface waters from any source; or,
  - c. Mudflows which are proximately caused by flooding as defined herein and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.
- (2) The collapse or subsistence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding.

*Flood insurance rate map (FIRM)* means an official map of a community, on which the administrator has delineated both the special hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a digital flood insurance rate map (DFIRM).

*Flood insurance study (FIS)* means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudflow and/or flood-related erosion hazards.

*Floodplain or flood-prone area* means any land area susceptible to being inundated by water from any source.

*Flood proofing* means any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

*Freeboard* means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization in the watershed.

*Highest adjacent grade* means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

*Historic structure* means any structure that is:

- (1) Listed individually in the National Register of Historic Places (a listing maintained by the department of interior) or preliminarily determined by the secretary of the interior as meeting the requirements for individual listing on the National Register;
- (2) Certified or preliminarily determined by the secretary of the interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the secretary to qualify as a registered historic district;
- (3) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the secretary of the interior; or,
- (4) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
  - a. By an approved state program as determined by the secretary of the interior; or,
  - b. Directly by the secretary of the interior in states without approved

programs.

*Letters of map change (LOMC).* A letter of map change is an official FEMA determination, by letter, that amends or revises an effective flood insurance rate map or flood insurance study. Letters of map change include:

- (1) *Letter of map amendment (LOMA):* An amendment based on technical data showing that a property was incorrectly included in a designated special flood hazard area. A LOMA amends the current effective flood insurance rate map and establishes that a land as defined by meets and bounds or structure is not located in a special flood hazard area.
- (2) *Letter of map revision (LOMR):* A revision based on technical data that may show changes to flood zones, flood elevations, floodplain and floodway delineations, and planimetric features. A letter of map revision based on fill (LOMR-F), is a determination that a structure or parcel of land has been elevated by fill above the base flood elevation and is, therefore, no longer exposed to flooding associated with the base flood. In order to qualify for this determination, the fill must have been permitted and placed in accordance with the community's floodplain management regulations.
- (3) *Conditional letter of map revision (CLOMR):* A formal review and comment as to whether a proposed flood protection project or other project complies with the minimum NFIP requirements for such projects with respect to delineation

of special flood hazard areas. A CLOMR does not revise the effective Flood insurance rate map or flood insurance study.

*Lowest floor* means the lowest floor of the lowest enclosed area (including basements and crawlspaces). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Federal Code 44CFR §60.3.

*Manufactured home* means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days, but does not include a recreational vehicle.

*Manufactured home park or subdivision* means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

*New construction* means, for the purposes of determining insurance rates, structures for which the start of construction commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, new construction means structures for which

the start of construction commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures. ~~structures for which the start of construction commenced on or after August 15, 2013 the date this floodplain ordinance was adopted and includes any subsequent improvements to such structures. Any construction started after February 2, 1977 and before August 15, 2013 is subject to the ordinance in effect at the time the permit was issued, provided the start of construction was within 180 days of permit issuance.~~

*Post-FIRM structures* means a structure for which construction or substantial improvement occurred after February 2, 1977.

*Pre-FIRM structures* means a structure for which construction or substantial improvement occurred on or before February 2, 1977.

*Recreational vehicle* means a vehicle which is built on a single chassis, 400 square feet or less when measured at the largest horizontal projection, designed to be self-propelled or permanently towable by a light duty truck and designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational camping, travel, or seasonal use.

*Regulatory flood protection elevation* refers to an elevation one and one-half feet above the 100-year floodplain.

*Regulatory Floodway* means the channel of a river or other watercourse designated on the FIRM and the city's master drainage studies and the adjacent land areas that must be reserved

in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

*Repetitive loss property.* Under the National Flood Insurance Reform Act, a repetitive loss structure is: “a building covered by a contract for flood insurance that has incurred flood-related damages on two occasions during a 10-year period ending on the date of the event for which a second claim is made, in which the cost of repairing the flood damage, on the average, equaled or exceeded 25 percent of the market value of the building at the time of each such flood event.”

Under FEMA, a repetitive loss structure is: “a property for which two or more National Flood Insurance Program losses of at least \$1,000 each have been paid within any 10-year rolling period since 1978.”

*Special flood hazard area (SFHA)* means the land in the floodplain subject to a one percent or greater chance of being flooded in any given year as set forth in this article.

*Special floodplain district.* See section 26-94.

*Start of construction*, for other than new construction and substantial improvement, under the Coastal Barriers Resource Act (P.L. – 97-348), means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a



structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of the construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

*Structure* for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

*Substantial damage* means damage of any origin sustained by a structure whereby the cost of restoring the structure to pre-event condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

*Substantial improvement* means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage regardless of the actual repair work performed. The term does not, however, include either:

- (1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or
- (2) Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure.
- (3) Historic structures undergoing repair or rehabilitation that would constitute a substantial improvement as defined above, must comply with all ordinance requirements that do not preclude the structure's continued designation as a historic structure. Documentation that a specific ordinance requirement will cause removal of the structure from the National Register of Historic Places or the State Inventory of Historic places must be obtained from the secretary of the interior or the state historic preservation officer. Any exemption from ordinance requirements will be the minimum necessary to preserve the historic character and design of the structure.

*Variance* means a grant of relief from the terms of a floodplain management ordinance.

*Violation* means the failure of a structure or other development to be fully compliant with the floodplain ordinance. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in the Code of Federal Regulations, Title 44, Chapter 1, Subchapter B, Part 60, Sec. 60.3(b)(5), (c)(4), (c)(10), (d)(3), (e)(2),

(e)(4), or (e)(5) is presumed by the floodplain administrator to be in violation until such time as that documentation is provided. Penalty and violations will be administered as detailed in section 26-92.

*Waiver* means an administrative exception approved by the Floodplain Administrator under section 26-105 related to existing structures or uses based on a finding by the floodplain administrator, or if appealed, by the board, that the requested waiver meets the standards set out for variances in section 26-104.

*Watercourse* means a lake, river, creek, stream, wash, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

#### **Sec. 26-94. Description of districts**

- (a) *Basis of districts.* The various floodplain districts shall include special flood hazard areas. The basis for the delineation of these districts shall be the flood insurance study (FIS) and the flood insurance rate maps (FIRM) for Chesapeake prepared by the Federal Emergency Management Agency, Federal Insurance Administration, dated ~~May 2, 1999~~ December 16, 2014, and any subsequent revisions or amendments thereto. The boundaries of the Special Flood Hazard Area and Floodplain Districts are established as shown on the flood insurance rate map which is incorporated and declared to be a part of this ordinance and which shall be kept on file at the offices of the floodplain administrator.

- (1) The special floodplain district shall be those areas identified as an AE Zone on the maps accompanying the flood insurance study for which 100-year flood elevations have been provided.
- (2) The approximated floodplain district shall be those areas identified as an A or A99 Zone on the maps accompanying the flood insurance study. In these zones, no detailed flood profiles or elevations are provided, but the 100-year floodplain boundary has been approximated. For these areas, the 100-year flood elevations and floodway information from federal, state, and other acceptable sources shall be used, when available. Where the specific 100-year flood elevation cannot be determined for this area using other sources of data, such as the U.S. Army Corps of Engineers Floodplain Information Reports, U.S. Geological Survey Flood-prone Quadrangles, etc., then the applicant for the proposed use, development or activity shall determine this elevation in accordance with hydrologic and hydraulic engineering techniques. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently-accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the floodplain administrator.

(b) *Overlay concept.*

- (1) The floodplain districts described above shall be overlays to the existing

underlying districts as shown on the official zoning ordinance map, and as such, the provisions for the floodplain districts shall serve as a supplement to the underlying district provisions.

- (2) If there is any conflict between the provisions or requirements of the floodplain districts and those of any underlying zoning district, the more restrictive provisions shall apply.
- (3) In the event any provision concerning a floodplain district is declared inapplicable as a result of any legislative or administrative actions or judicial decision, all other applicable requirements shall remain in effect.

- (c) *Jurisdictional boundary changes.* The city floodplain ordinance in effect on the date of annexation shall remain in effect and shall be enforced by the municipality for all annexed areas until the municipality adopts and enforces an ordinance which meets the requirements for participation in the National Flood Insurance Program. Municipalities with existing floodplain ordinances shall pass a resolution acknowledging and accepting responsibility for enforcing floodplain ordinance standards prior to annexation of any area containing identified flood hazards. If the FIRM for any annexed area includes special flood hazard areas that have flood zones that have regulatory requirements that are not set forth in these regulations, prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the governing body for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended

regulations shall be provided to department of conservation and recreation (division of dam safety and floodplain management) and FEMA.

In accordance with the Code of Federal Regulations, Title 44 Subpart (B) Section 59.22

(a)(9)(v) all NFIP participating communities must notify the Federal Insurance Administration and optionally the state coordinating office in writing whenever the boundaries of the community have been modified by annexation or the community has otherwise assumed or no longer has authority to adopt and enforce floodplain management regulations for a particular area.

In order that all flood insurance rate maps accurately represent the community's boundaries, a copy of a map of the community suitable for reproduction, clearly delineating the new corporate limits or new area for which the community has assumed or relinquished floodplain management regulatory authority must be included with the notification.

#### **Sec. 26-99. General Standards**

A. The following provisions shall apply to all permits:

- (1) New construction and substantial improvements shall be according to the Virginia Uniform Statewide Building Code and anchored to prevent flotation, collapse or lateral movement of the structure.
- (2) Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement.

- (3) New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage as specified elsewhere in this article.
- (4) New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.
- (5) The following items a. through e. shall not be located below the freeboard (one one-half feet above base flood elevation) unless specifically approved in writing by the floodplain administrator:
  - a. Electrical panels, sub-panels, junction boxes, and similar items.
  - b. Heating equipment, furnaces, heat pumps, boilers and similar items.
  - c. Ventilation equipment, dehumidifiers, fans and similar items.
  - d. Plumbing equipment, water heaters, pumps and similar items.
  - e. Air conditioning equipment, heat pumps, air handler units, condensers, and similar items.
  - f. Duct work in a crawl space may be installed below the freeboard

provided the bottom of the ductwork is above the base flood elevation.

- (6) Electrical wiring, plumbing pipes and gas piping below the freeboard shall be designed and located so as to prevent water from entering or accumulating within the components during conditions of flooding.
- (7) Residential fuel storage tanks (fuel oil and liquid propane) where possible will not be located or installed below the base flood elevation. If this is not possible and in the case of underground tanks, installation must comply with NFPA 58 and FEMA document #348 "Protecting Building Utilities from Flooding", both of which seek to prevent flotation of tanks due to possible high flood waters by securing the tanks in a sound fashion.
- (8) New and replacement water supply systems shall be designed and installed to minimize or eliminate infiltration of flood waters into the system.
- (9) New and replacement sanitary sewage systems shall be designed and installed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters.
- (10) On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.
- (11) New and replacement equipment and support shall be anchored to prevent



floatation, collapse or lateral movement.

B. In addition to provisions (a)(1) through (4011) immediately above, in all special flood hazard areas, the following additional provisions shall apply:

- (1) Prior to any proposed alteration or relocation of any channels or of any watercourse, stream, etc., a permit shall be obtained from the U. S. Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resources Commission (a joint permit application is available from any of these organizations), when required by applicable laws and regulations. Furthermore, in riverine areas, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the department of conservation and recreation (division of dam safety and floodplain management), other required agencies, and the Federal Emergency Management Agency.
- (2) The flood carrying capacity within an altered or relocated portion of any watercourse shall be maintained.

#### **Sec. 26-100. Specific Standards**

In all special flood hazard areas where base flood elevations have been provided in the flood insurance study or generated according to section 26-94, the following provisions shall apply:

- (1) *Residential construction.* New construction or substantial improvement of any residential structure (including manufactured homes) shall have the lowest finished floor, including basements, elevated one and one-half feet above the base flood level.

Flood Elevation certificates are required for new structures and additions prior to the issuance of a Certificate of Occupancy.

- (2) *Non-residential construction.* New construction or substantial improvement of any commercial, industrial, or non-residential building (or manufactured home) shall have the lowest floor, including basement, elevated one and one-half feet above the base flood level. Buildings located in all A, AO, AE, AH, and A1-30 Zones may be floodproofed in lieu of being elevated provided that all areas of the building components below the elevation corresponding to the BFE, plus two feet, are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A Virginia registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification, including the specific elevation (in relation to mean sea level) to which such structures are floodproofed, shall be maintained by the floodplain administrator in accordance with Section 26-93.

Flood Elevation certificates are required for new structures and additions prior to the issuance of a Certificate of Occupancy. Commercial buildings designed and constructed to be watertight below the design flood elevation must submit a Floodproofing Certificate prior to the issuance of a Certificate of Occupancy.

(3) *Elevated buildings.* Fully enclosed areas, of new construction or substantially improved existing structures, which are lawfully below the regulatory flood protection elevation shall:

- a. Not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator).
- b. Be constructed entirely of flood resistant materials below the base flood elevation;

(4) *Flood vents.* Fully enclosed areas below the lowest elevated floor shall include, in Zones A, AO, AE, AH, and A1-30, measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, the openings must either (i) be certified by a professional engineer or (ii) architect or meet the following minimum design criteria (for additional information, see FEMA Technical Bulletin #1), unless the Virginia Uniform Statewide Building Code specifically provides otherwise:

- a. Provide a minimum of two openings on different sides of each enclosed area subject to flooding.
- b. The total net area of all openings must be at least one square inch for each square foot of enclosed area subject to flooding.
- c. If a building has more than one enclosed area, each area must have openings to allow floodwaters to automatically enter and exit.
- d. The bottom of all required openings shall be no higher than one foot above the adjacent grade.
- e. Openings may be equipped with screens, louvers, or other opening coverings or devices, provided they permit the automatic flow of floodwaters in both directions.

Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and, therefore, do not require openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires openings as outlined above.

Removal of the structure from the SFHA in accordance with a FEMA approved letter of map change eliminates this requirement.

(5) *Standards for manufactured homes and recreational vehicles.*

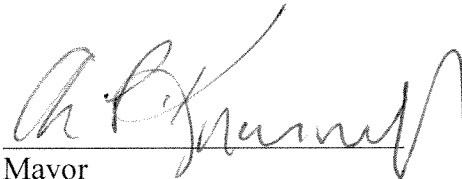
- a. All manufactured homes placed, or substantially improved, on individual lots or parcels, in expansions to existing manufactured home parks or subdivisions, in a new manufactured home park or subdivision or in an existing manufactured home park or subdivision on which a manufactured home has incurred substantial damage as the result of a flood, must meet all the requirements for new construction, including the elevation and anchoring requirements in section 26-99 and section 26-100.
- b. All recreational vehicles placed on sites must either:
  1. Be on the site for fewer than 180 consecutive days;
  2. Be fully licensed and ready for highway use (a recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices and has no permanently attached additions); or
  3. Meet all the requirements for manufactured homes in subsection (4)a.

- (6) *Critical infrastructure.* New construction of critical infrastructure will not be permitted within the special flood hazard area.

This ordinance shall become effective December 16, 2014.

**ADOPTED** by the Council of the City of Chesapeake, Virginia, on this  
21<sup>st</sup> day of October, 2014.

**APPROVED:**

  
\_\_\_\_\_  
Mayor

**ATTEST:**

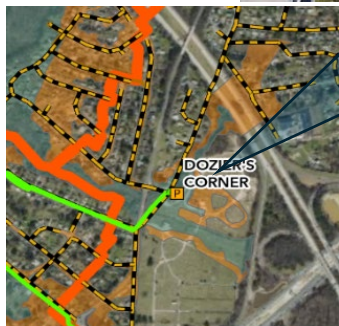
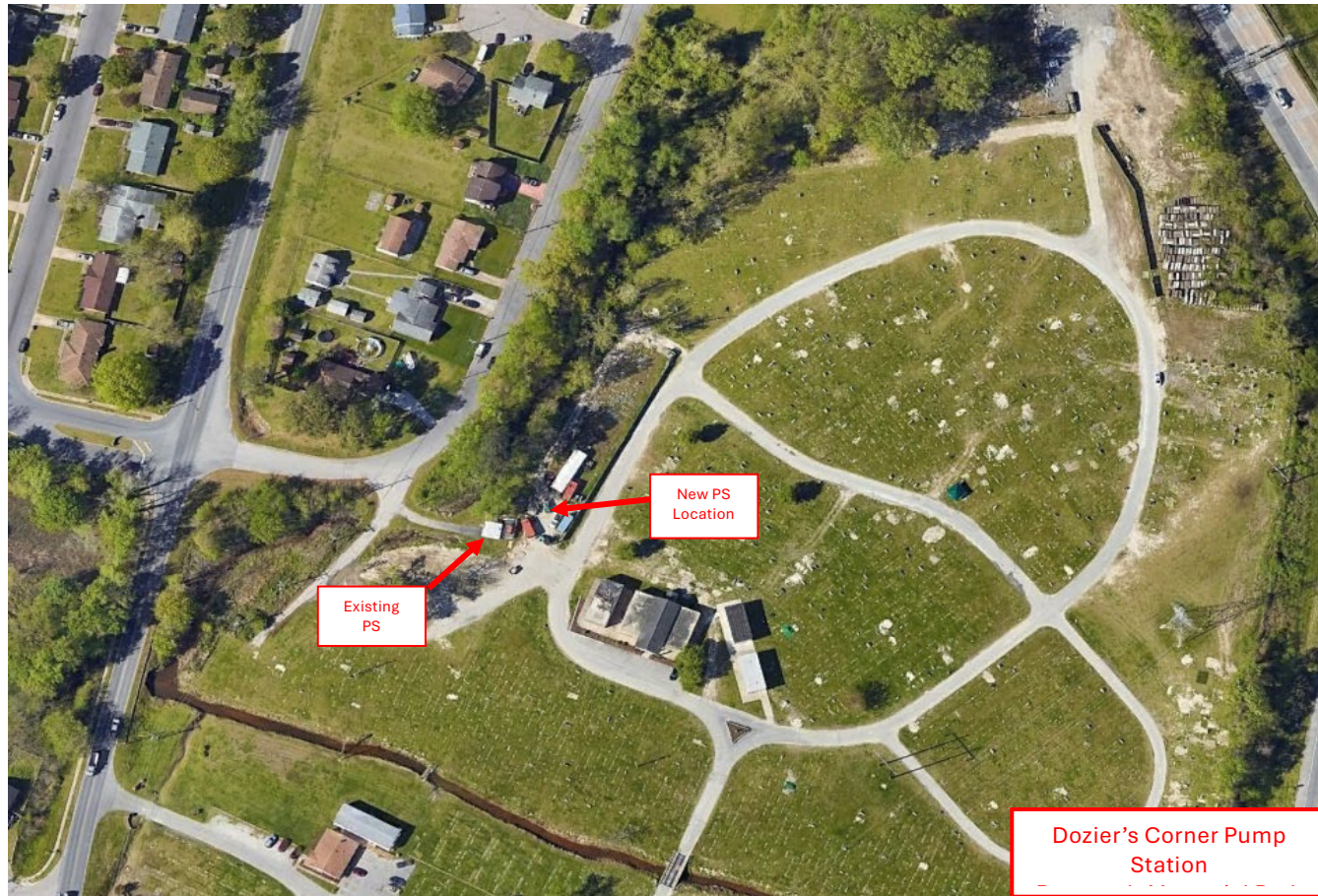
  
\_\_\_\_\_  
Clerk of the Council

CID519999\_HRSD\_CFPF-2\_Maps\_Project Area  
Applicant: Hampton Roads Sanitation District  
Project: Dozier's Corner Pump Station Replacement  
Detailed map of the project area, "Dozier's Corner Service Area"





CID519999\_HRSD\_CFPF-2\_Maps\_Project Area  
Applicant: Hampton Roads Sanitation District  
Project: Dozier's Corner Pump Station Replacement



Dozier's Corner Pump Station Existing and New Location

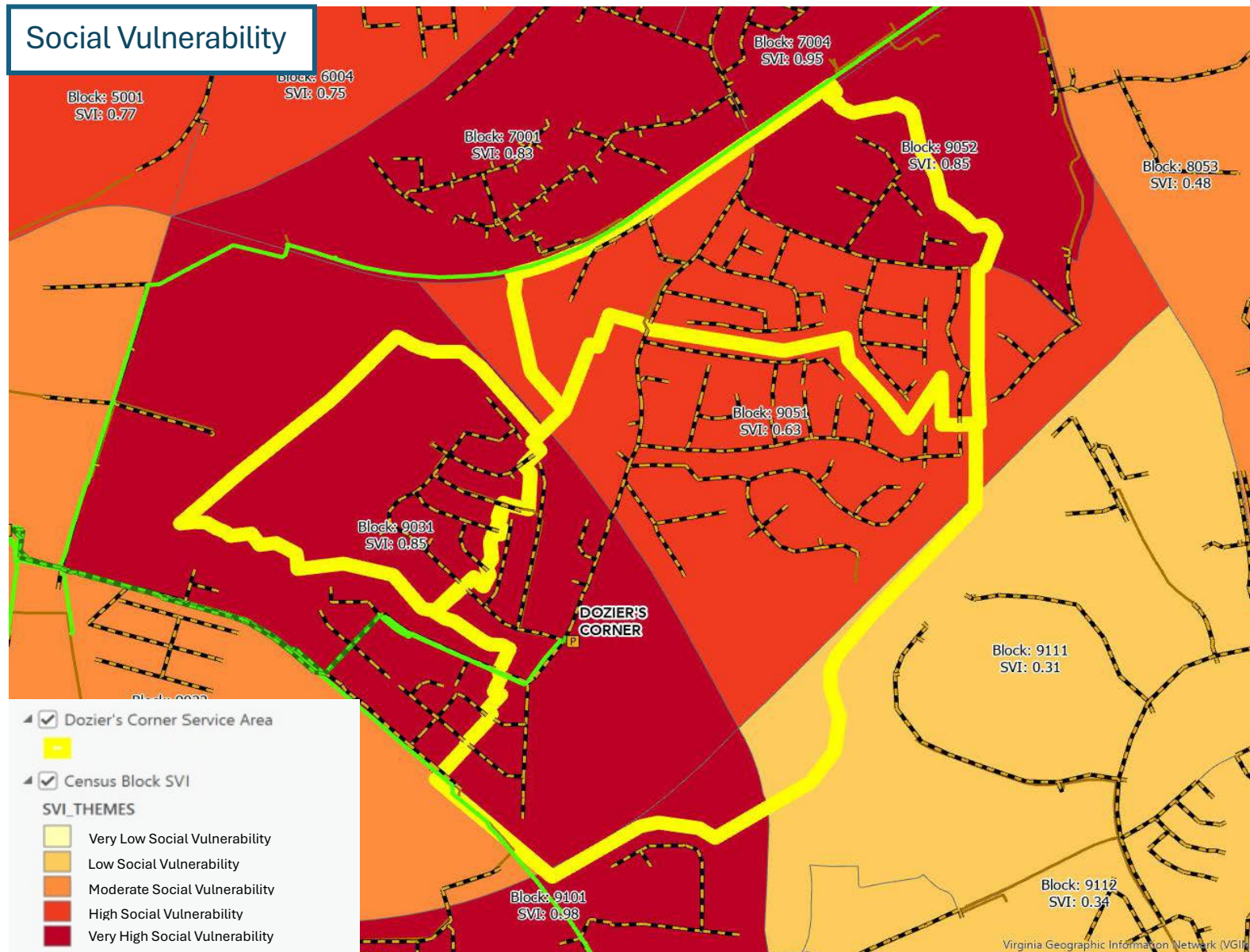


CID519999\_HRSD\_CFPF-2\_Maps\_SVI\_LowIncome

Applicant: Hampton Roads Sanitation District

Project: Dozier's Corner Pump Station Replacement

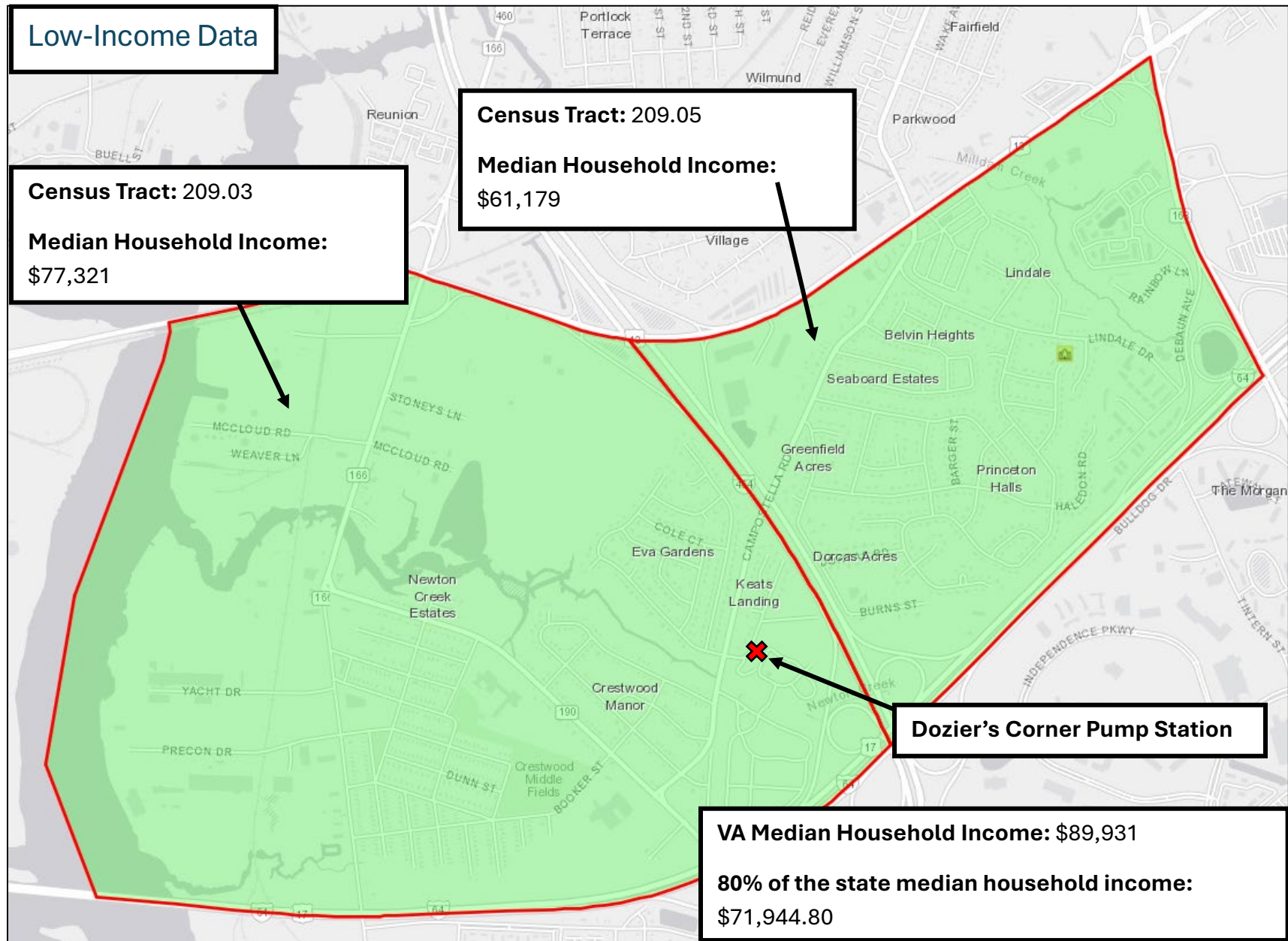
Census Block Social Vulnerability Index scores for the project area



CID519999\_HRSD\_CFPF-2\_Support\_Map\_Low-Income

Applicant: Hampton Roads Sanitation District

Project: Dozier's Corner Pump Station Replacement



CID519999\_HRSD\_CFPF-2\_MMMPlan

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

#### Supporting Information – Maintenance, Management, and Monitoring Plan

*For ongoing projects or projects that will require future maintenance, such as infrastructure, flood warning and response systems, signs, websites, or flood risk applications, a maintenance, management, and monitoring plan for the projects must be provided.*

The Dozier's Corner Pump Station is a design and construction project. Future maintenance will follow the attached HRSD Interceptor Systems Preventive Maintenance Manual, section 5, updated June 2023 (or as replaced). Any additional maintenance needs will be determined by the design and will be added to the plan as needed.

Attachment

# Interceptor Systems Preventive Maintenance Manual



Second Edition, 1998

*Updated June 2023*

*-Generally-*

The greater amount of preventive maintenance performed reduces the amount of corrective maintenance that will be required.

# **Interceptor Systems Preventive Maintenance Manual**

## **Table of Contents**

I.	Building Maintenance and Inspection
II.	Diesel Generators
III.	Force Mains
IV.	Gravity Systems
V.	Pump Stations
VI.	Alarm System
VII.	Portable Equipment
VIII.	Shop Equipment
IX.	Special Maintenance Procedures - North Shore
X.	Special Maintenance Procedures - South Shore
XI.	Odor Control and Chemical Use
XII.	Flow Pressure and Rainfall Monitoring

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*The table of contents and all sections removed, except Section 5, Pump Stations*

## **5. PUMP STATIONS**

Pump stations are a vital link to our overall system and must be treated as such. The Interceptor Technician should be aware of all problems and maintenance procedures required by each station. Typical pump station inspection forms are included as Forms 5-1 through 5-12. Pump station frequency schedule is listed on Form 5-13.

Any unusual condition that occurs at these stations should be reported immediately to the appropriate supervisor.

### **5.1. General**

Below is a list of general maintenance procedures to be performed on a regular basis. Frequency will range from once to month to as much as twice a week or as station needs dictate.

1. Transfer leads and lags, etc. on pumps and compressors in accordance with standing instructions.
2. Check level sensing devices (i.e., air compressor, transducers, etc. and air pressure; drain condensate.
3. Purge bubbler.
4. Where feasible, exercise all inactive pumps and check all pumps to ensure that they are operable.
5. Check dry well sump pump
6. Clean pump station and perform general housekeeping.
7. Clean wet well bar screen, hose (wash) floor and wall; check wet well for proper ventilation.
8. Inspect grinder
9. Visually check ALL piping and equipment to include light fixtures.
10. Test diesel generators and alarm systems.
11. Flush pressure sensors and bleed transducer units (where applicable).
12. Odor control systems
13. Exhaust fan systems
14. Redundancy systems (Generators, Interim Pumps, Temporary Pumps)
15. Alarm system
16. Log ALL clock readings; sign daily log book, include duties performed, date and time.

All maintenance performed, whether preventive or otherwise, shall be noted in the station log.

### **5.2. Air Compressor**

Preventive maintenance on air compressors includes the following:



- Keep unit clean
- Drain condensate
- Test safety valves
- Check pet cocks for leakage
- Examine operating controls
- Check bubbler line
- Manual purge
- Check air filter(s)
- Check dehumidifier.

#### **5.2.1. Condition Check**

All compressors should be thoroughly cleaned. Dirt, oil, grease, and other material must be thoroughly cleaned off the compressor and surrounding area. Check for leaks, unusual vibrations, etc. If compressor shows evidence of overheating or excessive noise, isolate from system until the cause is determined and repairs are made. Note that excessive running time on compressor would be indicative of air leak in system.

#### **Electrical Isolation – Only with Proper Authorization**

Place the compressor motor power supply switch (or circuit breaker) in the OFF position and tag with a "WARNING" card to prevent unit operation. Disconnect electric cord. Reverse procedure for restoration.

#### **5.2.2. Drain Condensation**

Drain the condensate (condensed water) from the air tank according to schedule or as needed. There is usually a small drain valve at the bottom of lower portion of the tank for this purpose.

#### **5.2.3. Safety Valve**

Test the safety valves. They prevent excessive pressure build-up by opening and venting to the atmosphere and are located on the air storage tank. To test the safety valve (or pop-off valve), lift the lever allowing air to escape; this will ensure the valve is operating properly.

#### **5.2.4. Operating Controls**

Examine operating controls. Make certain that compressor is starting and stopping at the proper settings by bleeding air from the tank through the drain valve. Inspect gage for accuracy; compare readings with recorded start-up values or other known readings. Dual Compressor Installations: Ensure that they are staged correctly, change leads according to schedule.

#### **5.2.5. Bubbler Line**

Check bubbler line. If the rotameter has a marking on the panel, check to see that the setting corresponds to the mark. These are typically located inside the control cabinet and therefore require the proper electrical PPE and safety training to access.



### **5.2.6. Manual Purge**

Purge the line. Depress the button on the control panel marked PURGE. This will automatically shut off the air to the pressure mechanism and provide a direct flow of air to the compression bell, purging the line. When released, controls return to normal operation.

In stations that are using with ControlWave operating systems, lines are purged by using the control screen (OIT) on the control cabinet.

*Note: An increase in gage pressure when purge button is activated is indicative of a problem - notify supervisor.*

### **5.2.7. Dehumidifier**

A visual inspection of this unit shall be performed and will include the following:

- Power on Light (green) - indicates power to the unit.
- High Air Temperature Warning Light (red) - gives indication of refrigeration system malfunction or overloading.
- Automatic Condensate Drain Trap - this is an automatic operation; check for any visible blockage.

In the event of a red light condition, isolate unit from its power source, tag with a WARNING card, and notify appropriate supervisor.

### **5.3. Level Transducer**

Check transducer stilling well for any obstructions such as grit or grease. Verify water flow is not restricted. Remove the transducer from the stilling well to test for proper operation and cleaning.

### **5.4. AUTOCON and/or Float Ball – Drywell**

- All system AUTOCON bells and mounting brackets, the plastic tubing and wall fasteners, and the tubing connections at the bell and the inlet side of the diaphragm enclosure shall be carefully inspected in each station. Promptly report any discrepancies to the appropriate Supervisor.
  - Float Balls – Make sure it works, at the right level, properly secured.

### **5.5. Ventilation**

Turn on exhaust fan(s) before entering wet well and/or drywell. Promptly report any problems incurred with installed ventilation to the appropriate Supervisor. Treat area being serviced by the exhaust fan as a confined space and provide portable ventilation as need. If problem does exist, turn power switch in control panel to the OFF position. If possible, lock in OFF position to prevent accidental power supply to the unit, and tag with a WARNING card. Exhaust fans should be turned off when leaving pump stations.

Installed ventilation shall be checked in accordance with the provided scheduled. Maintenance and inspection of installed ventilation shall be performed annually and consist of the following:

- Ensure power is turned off and breaker is locked in the OFF position.

- Prevent fan blades from unintentionally rotating prior to working on any moving component. Refer to HRSD SAFETY SOP for work on STAND DOWN and fans.
- Spin the motor shaft. Shaft should turn freely.
- Check belt(s) for any wear.
- Check sheave set screws to ensure tightness.
- Clean and remove any dirt/dust on the exterior of the motor, fan panel and propeller in accordance with manufacturer's recommendations.
- Remove lock and power ON unit.
- If grease fittings are provided, clean the fitting and apply a manufacturer's recommended grease at a very slow rate until a bead is formed. This should be done with the unit in operation.

#### **5.5.1. Maintenance**

Exhaust fans should be inspected, cleaned and maintained annually in accordance with manufacturers recommended maintenance.

### **5.6. Hot and Cold Weather Preparations**

This area should include the following for cold weather preparations:

- Secure motor room heat exhaust fans where applicable.
- Close and/or install vent covers where applicable.
- Turn heat lamps ON where applicable.
- Insulate all pipes that are subject to freezing.
- If extremely cold temperatures are predicted, the water supply to the pump station should be turned off at meter with appropriate Supervisor approval.
- The above procedures are reversed in the spring in preparation for warmer weather (where applicable).

#### **5.6.1. Winterization of Emergency/Temporary/Interim Pumps:**

- Install heat lamps and apply heat tape to appurtenances susceptible to freezing.
- Six-inch pumps volutes and smaller are to be drained of water and filled with antifreeze as necessary.
- Exposed volutes and check valves are to be wrapped in heat tape.
- Block heaters are to be inspected for proper operation.

### **5.7. Backflow Prevention - General**

Backflow preventers used in pump stations are of two general types: Pressure Vacuum Breaker (VB) and

Interceptor Systems Preventive Maintenance Manual

HRSD

June, 2023

Reduced Pressure Type (RP). These backflow preventers should be visually inspected per frequency schedule. Malfunction of these valves is usually indicated by weeping or dripping of the unit. Any leakage observed from these backflow preventers should be reported to the appropriate Supervisor. In case of substantial leakage, it may be necessary to cut the water supply OFF until the problem is corrected.

#### **5.7.1. Strainers**

Strainers on the water supply to the backflow preventers should be inspected and cleaned as needed.

#### **5.7.2. Annual Test and Inspection**

All Annual Test and Inspections will be scheduled by Facilities Maintenance Division and performed by a Certified Backflow Prevention Device worker approved by the local Jurisdiction. The results of the test of the individual backflow preventers are submitted to the appropriate local Jurisdiction Department of Utilities.

### **5.8. Pumps – General**

Keep exterior of pumps clean. Paint (touch-up) pump and components as needed. Keep all drains open and free of debris. Demonstrate that the wastewater pump is operable by starting the pump and observing its function. Run pumps manually and check if pumping at full speed. Observe the check valve (if possible) and the lowering of the well. Check for excessive oil or grease leakage from the bearings. Look for black powdery substance near bearings or shaft. Note if pump feels or smells hot. Note any unusual noises or vibrations; check applicable guards, shields, etc. Alternate pump leads in accordance with standing instructions.

#### **5.8.1. Packing Removal**

Packing is used to provide a seal where the shaft passes through the pump casing in order to keep air from being sucked into the pump and/or the water being pumped from coming out. Improper maintenance of packing can cause considerable damage to a pump sleeve and MUST periodically be replaced.

1. Turn pump main circuit breaker and control switch to the OFF position using lock out - tag out procedure.
2. If appropriate, close and tag pump suction and discharge valves prior to removal of packing glands.
3. Remove packing gland nuts and/or bolts and remove glands. Glands are usually split for easy removal. Visually inspect gland condition.
4. Remove packing. The packing rings can be removed by screwing a packing hook into each ring and pulling out. Sometimes it helps to rotate the shaft while pulling. Exercise caution while using the packing hook as to not nick or score the sleeve.
5. Inspect shaft and/or shaft sleeve for wear. See Ref. Para. 5.7.6.

#### **5.8.2. Packing Installation**

1. Cut packing to proper length. Packing should be kept free of dirt, sand, grit, or other foreign material. Make clean cuts (no ragged edges). Verify packing size and length prior to installation.
2. Stagger the joints (or butts) of the packing around the shaft.

3. Install packing gland, keeping the gland square with shaft at all times.
  - a. The last ring of packing may have to be installed after all other rings have been seated.
  - b. Tighten packing gland just enough to prevent excessive leakage starting pump. See Ref. Para. 5.8.3.
4. Open valves and restore pump to normal operation. Turn pump main circuit breaker and control switch to the ON position. Remove WARNING tag.

*Note: One additional packing ring may be added to the stuffing box when needed. Do not add more than one ring. Once this has been done, all old packing must be removed and new packing installed. Pump packing records should be maintained through the annual pump inspection report and on-site at the pump station. These records should be revised as needed.*

### **5.8.3. Packing Gland Adjustment**

Tighten packing gland just enough to prevent excessive leakage.

1. As the packing adjusts itself to the shaft, tighten the gland slowly one flat at a time on each nut, keeping the gland square until the leakage is reduced to approximately a slow trickle. Keep packing gland square with pump shaft to prevent rubbing of the two. To keep gland square:
  - a. Hand tighten first bolt until slack is taken up.
  - b. Insert other packing gland bolts and tighten to point of first resistance.
  - c. Tighten each bolt one flat at a time on alternate sides to insure an even take-up until the leak rate is properly adjusted. Uneven take-up jams the packing and the shaft. If the gland becomes too hot, it is pulled up too tight. Stop the pump and allow the packing to cool, and then readjust.

### **5.8.4. Pumping Range (on and off levels)**

This test is to check the ON and OFF levels which are set for all pumps.

1. Allow the wet well to fill until the lead pump comes on automatically.
2. Check that the pump starts at the correct level.
3. Shut the lead pump off and let the well continue filling until the second pump starts.
4. Check the starting level of this pump and continue with the same procedure until all pumps have been tested for starting level.
5. Turn all pumps on AUTO and check the stop (OFF) level as each pump stops.

*Note: Pumps at some stations may be staged differently. In this case, pump operating levels that do not correspond with the posted operating levels at a particular station should be brought to the attention of the appropriate Supervisor.*

### **5.8.5. Impellers**

1. Pump impellers should be inspected as part of the annual preventive maintenance check. Before inspecting a pump impeller:
  - a. Turn pump main circuit breaker and selector switch to the OFF position, utilizing lock out - tag out procedure.
  - b. Close suction and discharge gate valves (do not depend on discharge check valve).
2. Drain pump with bolts still in inspection plate until water stops (a precautionary step, in the event something prevents a valve from fully closing).
3. Open inspection plates and visually inspect for foreign objects which might cause injury (razor blades, sharp objects, etc.). Use a special hook or tool to remove debris. When the area is clear, the impeller can be inspected. When inspecting a pump impeller, check for:
  - a. Cavitation marks. These appear as holes, indentations, cracks, etc.
  - b. Chips, broken tips, corrosion, unusual wear.
  - c. Tightness on shaft. Hold shaft and try to wiggle impeller, inspect impeller nut. Pry up and down with a piece of wood.
  - d. Wearing rings on impeller and volute for thickness, clearance, and general condition.

#### **5.8.6. Shafting**

Pump shafts are used to turn the impeller, mount the bearings, and are connected to a pump driver (motor) of some type. Any maintenance performed on the shaft must be done with the motor switch in OFF position, utilizing lock out - tag out procedure. All components shall be checked according to frequency schedule unless stated otherwise.

1. Impeller end - where the impeller is secured onto the shaft. This part is usually not a problem to maintain if impeller is kept tight and is to be included as part of the annual preventive maintenance inspection.
2. Couplings - inspect coupling ends daily. Set screws must be tight, and if found continually loose must be replaced. Check keyway, bolts, etc.
3. Slip joint (splined) - accommodates endwise movement (1/2 to 3 1/4 inches according to size, type and length of shaft). Check that splines are not jammed into the yoke or that they are not extended beyond the limits of the yoke.
4. Pillow block bearings - visually inspect daily. Check for any unusual bearing vibration and/or noise.
5. Pump bearings - check for any unusual bearing vibration and/or noise daily.
6. Universal joints - to inspect, remove the shaft and test bearings by moving the yoke in all directions to roll the needles. If action is rough or uneven, replace.
  - a. A daily visual inspection will usually reveal bearing failure by the appearance of a brown powder in that area. When greasing, if grease does not come out of all four bearings, possible bearing failure is indicated.

b. Other clues to failing U-joints:

- i. Any play or detectable motion when joint is rocked back and forth (with unit OFF, but still coupled).
  - ii. Unusual noise or vibration while equipment is operating.
7. Sleeve (stuffing box area) - shaft sleeves are designed to protect the shaft by taking the wear from the packing. Shafts and/or sleeves in this area should be inspected each time the pump is repacked. This inspection is performed after the packing has been removed (See Ref. Para. 5.8.1) and the stuffing box area cleaned. Inspect for grooves, split shaft seal and any other unusual conditions. The sleeve should be replaced when grooves are observed and/or felt. A worn sleeve must be replaced before wearing through to the shaft.

#### **5.8.7. Bleed Line System**

The automatic bleed-off system on each pump should be checked daily for proper operation. Valves on the bleed-off system should be exercised daily to ensure proper operation. Replace components as needed.

#### **5.8.8. Lubrication**

All pumps, pillow block bearings, and universal joints shall be greased with an approved lubricant according to frequency schedule.

#### **5.8.9. Pump Performance**

Pump performance testing should be performed as necessary when significant pump improvements/modifications are made, such as new/rehabilitated impeller.

In evaluating the performance of a particular pump, the following indications or methods may be useful:

1. Comparison of elapsed time meter readings. A change in pump running times may indicate problems.
2. Position of check valve lever arm (where provided).
3. Movement of wet well level indicator.
4. Calibrated liquid filled pressure gage.
5. Amperage demand (where meter provided).

Prior to completing the pump performance testing below, the following should be completed/verified.

1. Verify performance test information with appropriate System Manager or Superintendent.
2. Contact the Data Analysis group a minimum of one (1) day prior to performing the test. Request that the data recording frequency be changed to 2-second or the minimum allowable by the recorder.

NOTE: Performance testing is for wet well pump stations ONLY. Procedures for performance testing of PRS pump stations is under development.

##### **5.8.9.1. Pump Performance Test – Using installed MMPS Flow Meter**

Pump performance testing should be performed for each pump upon completion of the Annual Pump PM.

- Determine flow, pressure and pump speed for test(s).
- Install pressure gauge on pump volute.
- Close individual pump discharge valve a minimum of 75 percent.
- Start pump in HAND and ramp up to desired speed.
- Check pressure gauge and OPEN/CLOSE discharge valve to reach desired pressure.
- Once desired pressure is achieved, run pump for a minimum of 30 seconds at the desired pressure and record the time.
- Shut off pump, return mode to AUTO and open discharge valve.
- Repeat for each installed pump.

#### **5.8.9.2. Pump Performance Test – Using Wet Well Volume**

Pump performance testing should be performed for each pump upon completion of the Annual Pump PM.

- Determine pump speed for test(s).
- Ensure sluice/slide gate or isolation valve is operational.
- Install pressure gauge on pump volute.
- Close individual pump discharge valve a minimum of 75 percent.
- Completely close sluice/slide gate or isolation valve. Note the wet well level.
- Start pump in HAND and ramp up to desired speed. Run pump at desired speed for 60 seconds recording the wet well level at the beginning and end of 60 second period. At approximately 30 seconds into test, record pressure from gauge on volute.
- If sluice/slide gate or isolation valve is inoperable or nonexistent, perform the following:
  - Test shall be performed when wet well level is at or below the influent invert elevation.
  - Upon pump shutting off, document the time and wet well level.
  - Allow wet well level to fill for approximately 5 minutes, at which point, the time and wet well level should be documented.
- Open sluice/slide gate or isolation valve, shut off pump, return mode to AUTO and open discharge valve.
- Repeat for each installed pump.
- Provide recorded information to appropriate supervisor.

#### **5.8.10. Variable Speed Units**

Variable speed units should be exercised and accomplished by operating the unit in manual mode and verifying its proper function through full range. Notify the appropriate Supervisor of any discrepancies.

#### **5.8.11. Seal Oil – Dry-Pit Submersible Pumps**

The following procedures are for the changing of Seal Oil for Dry-Pit Submersible Pumps in accordance with Form 5-11 and the Inspection Schedule. These procedures should also be followed if a Seal Fail Alarm has occurred.

1. Lock and Tag out pump.
2. Drain old oil from seal cavity by removing oil cavity inspection plug, then remove lower inspection plug. NOTE: USE CAUTION WHEN REMOVING PLUG, CAVITY MAY BE PRESSURIZED.
3. Complete oil drain with assistance from shop-vac.
4. Completely clean lower seal plug and O-ring and re-install on pump.
5. Fill seal oil cavity with required amount of manufacturer's approved oil.
6. Completely clean upper seal plug and O-ring and re-install on pump.
7. Remove Lock and Tag from pump and place unit back in service.

#### **5.9. /Temporary/Interim Pump**

Emergency/Temporary/Interim Pump(s) that are setup at a Pump Station are necessary to maintain reliable operation of the system. For winterization of pump(s), see Section 5.6 above.

##### **5.9.1. Weekly Inspection**

The following procedures shall be performed weekly in accordance with the Inspection Schedule.

1. Check oil, fuel and cooling fluid before starting test. Fuel level should be checked in accordance with Section 2.5, Diesel Fuel Storage Tanks.
2. Turn station pumps off.
3. Let the wet well level build until the emergency pump is called to operate by the bubbler, transducer or floats. Verify that the pump starts at the correct setting.
4. Once the pump starts, monitor the engine and oil temperature, battery voltage and RPMs.
5. Verify that the pump shuts off at the correct setting.
6. Turn station pumps on and verify that all pumps are primed and ready to operate.
7. Notify the appropriate supervisor immediately of any abnormalities.

##### **5.9.2. Maintenance**

Routine maintenance shall be performed in accordance with the manufacturer's recommendations or at a



minimum, annually.

## **5.10. Sump Pump**

Fill the sump basin and verify that the pump starts and stops automatically at the proper level. Visually inspect pump.

### **5.10.1. Monthly Inspection**

1. Pump all the water possible out of the basin. Remove electrical plug from the wall outlet.
2. Disconnect pump at the union, if provided, and remove from the basin.
3. Check strainer, bottom cover, etc. - clean unit of grease and other debris.
4. Check float for pin holes or wear spots.
5. Test the check valve by slowly opening the discharge gate valve. If water flows from the line, the check valve is faulty. In this case, close the gate valve and repair or replace the check valve as determined.
6. Clean the sump basin thoroughly and reinstall the pump.
7. Restore the pump to service by opening the discharge gate valve and reconnecting the electrical plug to the wall outlet.

Fill the sump basin until pump automatically starts and verify if operating properly.

## **5.11. Check Valves - General**

Check valves shall be visually inspected for proper operation in accordance with the Inspection Schedule. A back spinning pump or a whistling noise from a check valve is usually a reliable indicator of a malfunctioning check valve. If this condition is observed, the unit controls should be tagged out of service and the pump discharge valve closed to prevent recirculation of wastewater. This must be reported to the appropriate Supervisor as soon as possible.

### **5.11.1. Inspection**

During annual inspection, check valves are to be disassembled, as necessary, and the yoke, shaft, body, swing arm, disc, seats and key stock are to be cleaned and inspected for excessive wear.

### **5.11.2. Lever Arm**

Other problems that might be observed include weeping or dripping at the lever arm shaft. This condition is corrected by adjusting or repacking the lever arm shaft stuffing box or replacement of O-ring seals. The lever arm should be checked for slack or play. This would be indicative of worn keyway or missing (loose) set screw.

### **5.11.3. Hydraulic Check Valves**

Certain pump stations are equipped with hydraulic check valves. These valves should be inspected, adjusted (if needed), and serviced. This will include checking the fluid level in the hydraulic closure device, utilizing the appropriate safety procedures.

Any adjustments or repairs to these valves should be in accordance with the manufacturers' recommendations.

### **5.12. Suction and Discharge Isolation Valves**

All suction isolation valves and all discharge isolation valves should be completely exercised (closed and opened) to ensure that they do not become inoperative. A thin coat of grease should be kept on all open stems. Verify condition and operability of any installed chain/pulley systems for valve operation.

#### **5.12.1. Repacking**

Before repacking, verify the isolation valve is in the fully closed position. This will prevent excessive leaking when the packing is removed. Repack isolation valve in accordance with manufacturer's recommendations. The following is for repacking of gate valves.

1. Remove all packing from the stuffing box.
2. Clean valve stem with fine emery cloth.
3. Insert new split ring packing in the stuffing box, staggering the joints and tamping down while inserting.
4. Lubricate stem with a thin coat of grease and tighten down the packing just enough to keep from leaking.

### **5.13. Wet wells - General**

Particular attention should be paid to the state of cleanliness in all wet wells. Floors, walls, ceilings (where needed), sluice/slide gates, bar screens, hydraulic grinders, etc. should be washed down. When cleaning a wet well, check for any floating debris which might plug or damage a pump, and remove such debris.

#### **5.13.1. Cleaning Instructions**

1. Isolate influent. This should be accomplished with installed infrastructure at the PS (sluice/slide gate or isolation valve, etc.) or through the installation of temporary measures, such as a plug.
2. Use a hose and nozzle to wash the solids off the walls while the well is being pumped down. If solids are heavier than normal, pump out in stages. If water pressure does not remove the solids from the walls, the wet well walls must be scraped.
3. The scum build-up should be removed by scraping as needed and noted in the station log. The scraping should include all areas that can be reached - behind the bar screen and the rear side of the well (where an opening is available), as well as the sluice gate, steps, etc.
4. At the time of the cleaning, the accumulation of scum and rags on the bar screen should be removed.
5. In order to alleviate the build-up of scum and solids in the wet wells, all stations (where feasible) should be pumped down according to schedule (or as required) to their lowest level and back flushed as required. Ensure that pumps are re-primed after pump-down.
6. Visually check sand accumulation according to schedule. This can be performed during the Step 4 procedure.

### **5.13.2. Wet Well Isolation - Gate or Valve**

All gates or valves shall be exercised (closed and opened) monthly to ensure that they do not become inoperable. Gate will be either sluice or slide type. Valve may be gate or plug type.

For sluice/slide gate, a thick coat of grease should be kept on the stems and tracks. In the case of large pumping stations, if it is not feasible to completely close the sluice gate, operate these gates as far down as possible without causing operational problems. During operation of sluice/slide gate, observe stem in wet well to ensure that it is not bending. The guides and wedges should be checked for proper operation. Check for areas around the gate where water is leaking by and make the appropriate adjustments

For an isolation valve, refer to Section 3.3.

### **5.13.3. Bar Screens**

Bar screens are installed to prevent large debris from entering and plugging or damaging a pump. The screens should be cleaned to ensure that there is no substantial restriction of wastewater flow to the pumps.

The cleaning is accomplished with a forked tool (rake) or any type tool capable of picking up and removing debris from the bar screen. Note the condition of the screen during each cleaning.

Particular attention should be paid to the state of cleanliness in all pump stations. Rags containing oil, grease, etc., should be properly disposed of immediately after use. All housekeeping duties should be performed on an "as needed" basis.

## **5.14. Hydraulic Grinders**

### **5.14.1. Hydraulic Power Pack**

1. Maintain correct fluid level by ensuring hydraulic fluid is between the high level and low level marks on the sight glass.
2. Fluid should be changed every 12 months by opening the drain plug at the bottom of the tank after the HPP has been shut down. Discard all drained fluid and replace with fresh uncontaminated fluid.
3. The HPP replaceable canister type filter on the return line should be changed when the filter indicator pops up.
4. The suction strainer should be cleaned as necessary. If the strainer is damaged or cannot be thoroughly cleaned, replacement is recommended.

### **5.14.2. Grinder**

1. The grinder should be visually inspected during each visit to the station. The inspection should include smoothness of operation, noise, stuck debris, any signs of damage, or signs of excessive wear.
2. The grinder should be inspected yearly (or as required by manufacture's recommendation) during station PM by locking and tagging out the grinder and removing the grinder from the channel to inspect the following:
  - a. Screen Drum Inspection – Remove any buildup of debris. After cleaning, check the screen drum for dents, damage, or uneven rotation of the drum.

- b. Cutter Wear – Check the grinder cutters for wear. Worn cutters should be replaced if the size of the reduced solids becomes unacceptable or the grinder jams excessively.
- c. Cutter Stack Tightness – Check cutter stack tightness by inserting a long screwdriver in between adjacent cutters on each shaft and moving the tool forward and back. Verify that none of the cutters or spacers shift along the shaft axis when pushed. If any of the cutters or spacers shift along the axis, the cutters are loose and must be removed, cleaned, and restacked.
- d. Intermediate Shaft Support Inspection – Verify the cutter shaft support housing fits snugly with a small amount of free movement and does not overheat during normal operation. Replace the shaft support if any uneven wear or excessive tightness is noted.
- e. Grease Gears – The drive and driven gears in the top end housing are greased as part of the inspection.

### **5.15. Housekeeping - General**

Below is a typical Interceptor Technician's list of general housekeeping duties:

1. Floors should be kept free of grease, oil, etc., swept and/or mopped down as needed. Trash containers should be emptied.
2. Walls should be kept free of grease, oil, etc., and washed down (if feasible) as needed. Particular attention should be paid to walls within the pump rooms.
3. Stairways (including handrails, landings, etc.) should be kept clear at all times, swept and/or washed as needed.
4. Windows should be washed; sills, frames, etc., dusted as needed.
5. Doors should be kept free of dirt, grease, etc. Telltale signs of maintenance such as fingerprints and/or handprints shall be removed.
6. All spare parts stored in each station should be tagged with the appropriate information; the cabinets and/or storage racks shall be kept neat and orderly (see safe work practices).
7. The following items of equipment should be kept free of grease, oil, etc., wiped and/or dusted as needed:
  - a. Air compressors - exterior surface.
  - b. Control panels - exterior surface.
  - c. Motors - exterior surface.
  - d. Pumps - exterior surface, including suction / discharge lines, gate valves, check valves, etc.
8. Bulletin boards and/or chalk boards should be maintained and kept current; include all applicable station logs and other posted information.
9. Toilet facilities should be kept clean and serviced; include all sinks, commodes, soap and towel dispensers, mirrors, etc.

*Note: Exercise caution when mopping the motor room floor; ensure that water does not lie dormant beneath the electrical control panel or at the base of the panel. As a rust preventive, keep a thin coat of grease on those shafting components that do not require painting. To avoid damage to pump bearings, do not hose down above stuffing box of pumps.*

## **5.16. Shaft Guards and Safety Chains**

### **5.16.1. Shaft Guards, Shields, and Cages**

Shaft guards or cages are required around all revolving shafts up to a point seven feet above the floor or platform surface. Their purpose is to prevent personnel and their clothing or equipment from coming in contact with the revolving shaft.

Shaft guard enclosures are usually constructed of light angle-iron frames covered with expanded metal. Hinged handholes may be provided in the guards to allow access to the shafting components for lubrication and inspection. Shaft guards should be painted safety yellow and should be inspected for general condition.

### **5.16.2. Safety Chains and Ropes**

Safety chains or ropes are normally provided as a safety device around floor openings where frequent access is required and it is not feasible to provide rigid rails. They are constructed of 3/16" chain or heavy nylon rope, utilizing Halyard-snap ends.

Safety chains / ropes should be carefully inspected according to frequency schedule and should be replaced immediately if there are any signs of deterioration or failure.

*Form 5-1. Typical Daily Pump Station Report*

**PUMP STATION DAILY REPORT**

PUMP STATION	IN	OUT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

1. Wet Well Fan	6. Pumps	11. Sump Pump	16. General Appearance
2. Barscreen/Grinder	7. Bleed Line	12. Run Time Clock	
3. Panel Lights	8. Shafting	13. Generator	
4. Purge System	9. Bearing Noise	14. Housekeeping	
5. Air Compressor	10. Packing Gland	15. Temporary/Interim Pump	

REMARKS:

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

Form 5-2. Typical North Shore Weekly Pump Station Report

**PUMP STATION WEEKLY REPORT**

PUMP STATION	1	2	3	4	5	6	7	8	9	10
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										
NAME										

1. Wet Well

2. Check Light Fixtures

3. Transfer Leads

4. Check Tide Gate

5. Exercise Pumps

6. Landscaping

7. Pipe and Equipment

8. Air Compressor - Bleed

9. Generator Cooling System

10. Pressure Sensor/Transducer

REMARKS:

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

PUMP STATION MONTHLY REPORT

PUMP STATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								
NAME																								

1. Sump Pump Inspection

2. Alarm Test

3. Autocon Inspection

4. Ladders

5. Wet Well Inspection
6. Operate Sluice Gate

7. Variable Speed Test

8. Check Valve Inspection

9. First Aid Kit

10. Fire Extinguisher(s)
11. Eyewash Station(s)

12. Back Flow Preventer

13. Signs

14. MSDS Book(s)

15. Emergency Lighting
16. Staircase

17. Paint (Touch Up)

18. Chains

19. Hoist(s)

20. Hatches
21. Guards - Rotating Devices

22. Shaft Guards

23. Grating

24. Guard Rails

REMARKS:

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_



Form 5-5. Typical Valve Inspection Report

SEMI-ANNUAL VALVE INSPECTION REPORT

		PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4
PS NAME	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
	SUCTION VALVE:				
	DISCHARGE VALVE:				
REMARKS:					

Form 5-6. Typical Annual Pump Inspection Report

# ANNUAL PUMP INSPECTION REPORT

DATE:		PUMP NO.:	
PUMP STATION:		CLOCK READING:	
CMMS WO NO:		CMMS WO TYPE:	

COMMENTS: Indicate conditions of inspection items as VERY GOOD, GOOD, FAIR, POOR or NEEDS REPAIR (NR).

PUMP TYPE:		CHECK VALVE	
PUMP FRAME:		CONDITION:	
SUCTION VALVE:		YOKE:	
DISCHARGE VALVE:		SEAT:	
TOP BEARING:		DISC:	
BOTTOM BEARING:		O-RINGS/PACKING:	

IMPELLER		NOSE RING	
CONDITION:		CONDITION:	
LENGTH:		OD:	
DIAMETER:		ID:	
		THICKNESS:	

VOLUTE		BASE RING	
CONDITION:		CONDITION:	
DEPTH:		OD:	
DEVCON:		ID:	
COATING:		THICKNESS:	

CLEARANCE		STUFFING BOX	
CONDITION:		CONDITION:	
GASKET MATERIAL:		PACKING GLAND CONDITION:	
GASKET THICKNESS:		SLEEVE CONDITION:	
METAL TO METAL:		PACKING INSTALLED:	
SHIM THICKNESS:		PACKING NEEDED:	

\*This is an example of CMMS Checklist.

REMARKS:

SIGNATURE:

\_\_\_\_\_

## ANNUAL PUMP STATION WET WELL INSPECTION REPORT - BELOW GRADE

DATE/TIME:	WALL COATING SYSTEM TYPE:	
INSPECTOR:	COATING CONDITION:	
PUMP STATION:	SURFACE pH, LOCATION:	
PUMP STATION NO.:	SAND DEPTH (inches):	
PRE-CLEANED PRIOR TO INSPECTION:	DECK MATERIAL:	
ODOR CONTROL SYSTEM TYPE:	STAIR/LADDER CONDITION:	
VENTILATION SYSTEM CONDITION	(Yes, No)	

COMMENTS: Indicate conditions of inspection items as VERY GOOD, GOOD, FAIR, POOR or NEEDS REPAIR (NR). Directional indications are to be determined by the PS valve guide directional positioning. Type of Wall Coating System include: T-Lock, Epoxy, Grout, None, etc. Type of Odor Control System include: Scrubber, Carbon, Liqui-Fog, Ozone, None, etc.

	NORTH WALL	EAST WALL	SOUTH WALL	WEST WALL
Condition:				
Depth of Corrosion:				
Visible Defects:				
Visible Aggregate:				
Visible Cracks:				

	CEILING	INTERMEDIATE DECK	INFLUENT CHANNEL	OTHER
Condition:				
Depth of Corrosion:				
Visible Defects:				
Visible Aggregate:				

Visible Cracks:			
	SLUICE GATE		VALVE
Structure Condition:			
Operability:			
Ability to isolate flow:			
Visible Aggregate:			
Visible Cracks:			
REMARKS:			

## ANNUAL PUMP STATION WET WELL INSPECTION REPORT - ABOVE GRADE

DATE/TIME:	ODOR CONTROL SYSTEM:
INSPECTOR:	WALL COATING SYSTEM:
PUMP STATION:	COATING CONDITION:
PUMP STATION NO.:	SURFACE pH, LOCATION:
	FLOOR MATERIAL:
	STAIR/LADDER CONDITION:

COMMENTS: Indicate conditions of inspection items as **GOOD, FAIR, POOR or NEEDS REPAIR (NR)**. Directional indications are to be determined by the PS valve guide directional positioning. Type of Wall Coating System include: **T-Lock, Grout, None, etc.** Type of Odor Control System include: **Scrubber, Carbon, Liqui-Fog, Ozone, None, etc.**

	NORTH WALL	EAST WALL	SOUTH WALL	WEST WALL
Condition:				
Depth of Corrosion:				
Visible Defects:				
Visible Aggregate:				
Visible Cracks:				

	CEILING	FLOOR	OTHER
Condition:			
Depth of Corrosion:			
Visible Defects:			
Visible Aggregate:			
Visible Cracks:			

REMARKS:



### WEEKLY TEMPORARY/INTERIM PUMP REPORT

<b>PUMP NUMBER:</b>		<b>LOCATION:</b>	
<b>HOOR METER:</b>		<b>FUEL ON HAND:</b>	

Indicate work performed with **INITIALS** and discrepancies with a **X**.  
All discrepancies and any corrective action taken should be noted in REMARKS.

	<b>ENGINE OIL</b>		<b>BELTS</b>
	<b>FUEL TANK</b>		<b>HOSES</b>
	<b>RADIATOR COOLANT</b>		<b>PRIMEGUARD OPERATION</b>
	<b>BATTERY FLUID</b>		<b>PUMP PIPING</b>
	<b>BATTERY CHARGER</b>		<b>TIRE PRESSURE</b>

REMARKS:

**SIGNATURE:** \_\_\_\_\_

**DATE:** \_\_\_\_\_



*Form 5-10. Typical Pump Lubrication Report*

**PUMP LUBRICATION REPORT**

PUMP STATION	DATE	PUMP HOURS			
		NO. 1	NO. 2	NO. 3	NO. 4

REMARKS:

**NOTE: LUBRICATE PUMPS, PILLOW BLOCK BEARINGS AND U-JOINTS**

## SEAL OIL PREVENTATIVE MAINTENANCE REPORT

		PUMP NO. 1	PUMP NO. 2	PUMP NO. 3	PUMP NO. 4
PS NAME	DATE:				
	HOURS:				
	WATER IN OIL:				
	DATE:				
	HOURS:				
	WATER IN OIL:				
	DATE:				
	HOURS:				
	WATER IN OIL:				
	DATE:				
	HOURS:				
	WATER IN OIL:				

### PROCEDURES:

1. Lock and Tag out pump.
2. Drain old oil from seal cavity by removing oil cavity inspection plug, then remove lower inspection plug. USE CAUTION WHEN REMOVING PLUG, CAVITY MAY BE PRESSURIZED
3. Complete oil drain with assistance from shop-vac.
4. Completely clean lower seal plug and o-ring and re-install on pump.
5. Fill seal oil cavity with required amount of oil (**ISO 32 FOOD MACHINERY OIL**).
6. Completely clean upper seal plug and o-ring and re-install on pump.
7. Remove Lock and Tag from pump and place unit back in service.

### REMARKS:

**PUMP STATION BUILDING INSPECTION REPORT**

DATE \_\_\_\_\_

PS \_\_\_\_\_

WO# \_\_\_\_\_

EXTERIOR					
SECTION	DESCRIPTION	GOOD	FAIR	POOR	COMMENTS
1.2	General Appearance				
1.2.1	Walls				
1.2.2	Roofing (visual from ground level only)				
1.2.3	Chimney, Vents and Flashing				
1.2.4	Gutters and Downspouts				
1.2.5	Louvers, Screens and Grills				
1.2.6	Steps, Hatches and Rails				
1.2.7	Doors, Windows and Trim				
1.2.8	Emergency Signage				
1.2.9	Fences, Gates and Driveway Barriers				
1.2.10	Walks and Driveways				
	Vaults and Chambers				
	Manhole Covers and Valve Boxes				

INTERIOR					
SECTION	DESCRIPTION	GOOD	FAIR	POOR	COMMENTS
1.3	General Appearance				
1.3.1	Walls, Ceilings and Floors				
1.3.2	Steps, Rails and Platforms				
1.3.3	Ventilation Ductwork				
1.3.4	Doors, Windows and Trim				
	Safety Signs, Tags, Labels				
	Pumps				
	Piping				

	Valves				
	Bathroom				
	Painting				
	Wet Well Appearance				
	Wet Well Condition				
	Wet Well Appurtenances				

**SIGNED** \_\_\_\_\_  
 \_\_\_\_\_



Form 5-14. Pump Station Inspection Schedule

Interceptor Systems Preventive Maintenance

Inspection Schedule

Item	Daily*	Weekly	Monthly	Quarterly	Semi-Annually	Annually	Other
<b>Air Compressor</b>							
Air Filters – Check		X					
Bubble Line - Check	X						
Clean Unit			X				
Change Leads		X					
Condensate - Drain		X					
Oper. Controls – Check	X						
Pet Cocks - Check	X						
Purge – Manual	X						
Safety Valve - Test			X				
Settings – Test			X				
AUTOCON/Float Ball – Check			X				
Dehumidifier – Check		X					
<b>Backflow Preventer</b>							
Visual Inspection	X						
Clean Strainer							As Required
Test						X <sup>(FM)</sup>	
<b>Valves</b>							
Check Valves – Visual Inspection	X						
Isolation Valves - Exercise					X		
<b>General</b>							
Cold Weather Prep						X	
Hot Weather Prep						X	
Housekeeping	X						

Item	Daily*	Weekly	Monthly	Quarterly	Semi-Annually	Annually	Other
<b>Pumps</b>							
Alternate Leads			X				
Annual Pump Inspection (see form)						X	
Lubrication				X			
Packing Glands – Check	X						
Seal Oil					X		
Emergency Pump	X						
Shafting – Check	X						
Variable Speed Units - Exercise		X					
Safety Chains/Ropes Inspection			X <sup>(I)</sup>			X <sup>(S)</sup>	
Shaft Guards - Inspection						X	
Pump Performance Testing							Every 3 years or as required
<b>Emergency/Temp./Interim Pump - Test</b>		X					
<b>Sump Pumps</b>							
Visual Inspection	X						
Test & Service		X					
<b>Wet wells</b>							
Annual Wet Well Inspection						X	
Bar Screen – Clean	X						
Hydraulic Grinder - Check	X						
Hydraulic Grinder – Inspection						X	
Clean Well							As Needed
Check for Sand			X				
Wet Well Isolation Gate/Valve - Exercise			X				

\* During each station check by Interceptor Technician.

I – Interceptors; FM – Facilities Maintenance; S - Safety

## **6. ALARM SYSTEM**

Typical alarm test reports used by Interceptor Operations are included as Form 6-1. The alarm test schedule is on Form 6-2.

### **6.1. General**

Interceptor Operations utilizes two different systems for alarming purposes. System alarms are primarily transmitted via the Telog system and Pump Station alarms are primarily transmitted through the SCADA system. However, a few System alarms and Pump Station alarms are also transmitted through the other system.

The Telog system consists of a Telog server which communicates with remote Telog Data Recorders via cellular modems. This system is typically used for analog data recorded at Master Metering Sites, PSs, and other locations where SCADA system units are not installed.

The SCADA (Supervisory Control And Data Acquisition) system is currently comprised of two (2) independent systems. The legacy SCADA system consists of a MOSCAD FEP (Front End Processor), RTU (Remote Terminal Unit) and Intellution iFix System. The system has the capability of collecting a wide range of data on site and then transmitting via radio to a remote FEP, typically installed at an HRSD WWTP. From there, a connection to a TLS circuit (Ethernet) is made and the data is forwarded to the primary control FEP. The data is then “pushed” to the two (2) backup FEP nodes at the North Shore and South Shore Interceptor Operations. In the event of a failure at the primary FEP, the control switches to one of the other two FEPs. The FEPs are then interrogated by the MMI interpretation software Fix Dmacs for data and alarm processing. The FEP also pushes the data via a MODBUS interface to the Intellution iFix SCADA System, which is used to send alarms to the WIN911 Paging system. The iFix also feeds the EDS Server, which is used for historical archiving.

The new SCADA Alarm System is being deployed with Emerson’s Ovation SCADA system and is currently in the implementation and installation stage. Approximately ½ of HRSD’s remotes sites are currently using the new system. As sites are cut over to the new Ovation SCADA system, they are removed from the legacy iFix system to avoid duplication of alarms and data. The new Ovation SCADA system consists of local ControlWave PLCs for process control of the facility through a Maple graphics OIT. These controllers operate the station locally with operator adjustable parameters. If communications failures occur, these PLCs also run independent of the Top-End system and continue operations locally until communications are restored. All local sites are outfitted with CISCO routers that communicate to the Top-End system through the Verizon Wireless 4G network. Some local sites are also equipped with CISCO switches that communicate and connect the PLC to local equipment (e.g. VFD’s, Godwin Pumps, etc.).

The Top-End SCADA Ovation system consists of 3 Ovation Server systems located within the server rooms at South Shore, North Shore, and Small Communities. Each Top-End Server System is equipped and connected to a Verizon PIP router that communicates through the 4G network to the remote sites. When communications are available, every operating parameter that is available locally at the ControlWave PLC is also available at the Top-End. This includes all data and all control features. All remote operations are done through the Ovation SCADA software programmed with interfaces and graphics that exactly mirror the local OIT graphics. The Ovation Top-End system is also connected to a Win911 paging system that allows for notification of alarm conditions via paging, texts, and email. A hierarchy of user permissions through standard Window active directory is used to assign rights and privileges to user access and allow read-only, operator, supervisor, and administrative commands to all controls, alarming, and programming. DMP3 communications protocols are used between the PLC & Top-End SCADA servers with BSAP backup during periods of communications loss. Networking is done via standard TCP/IP with device IP



CID519999\_HRSD\_CFPF-2\_Authorization

Applicant: Hampton Roads Sanitation District (HRSD) Project

Name: Dozier's Corner Pump Station Replacement

Supporting Documentation – Authorization to Request Funding

*Authorization to request funding from the Fund from governing body or chief executive of the local government.*

Attached is a copy of the Hampton Roads Sanitation District Commission Meeting Minutes dated April 26, 2022, where the HRSD Commissioners approved the initial appropriation of funding for the Dozier's Corner Pump Station Replacement.

The HRSD Commission is established under the Code of Virginia Authorities:

<https://law.lis.virginia.gov/authorities/hampton-roads-sanitation-district-commission/>

In a separate attachment, CID519999\_HRSD\_CFPF-2\_Support\_Pledge, is the signed letter from the HRSD Chief Financial Officer, Steve de Mik, authorizing the application and request for funding from the Virginia Department of Conservation and Recreation, Community Flood Preparedness Fund.

Attachment



COMMISSION MEETING MINUTES  
April 26, 2022

7. **Dozier's Corner Pump Station Replacement  
Initial Appropriation**

**Action:** Appropriate total project funding in the amount of \$17,121,868.

**Moved:** Ann Templeman

**Seconded:** Willie Levenston

**Roll call vote:**

**Ayes:** 7

**Nays:** 0

**CIP Project:** AT015400

**Project Description:** This project will replace the existing Dozier's Corner Pump Station in the same location or relocated to a different site due to flooding and being surrounded by a cemetery. The pump station, if rebuilt on the same location, will need to be raised based on the 100-year flood information received from the City of Chesapeake. This project was originally planned to be included with work at the Washington District Pump Station (AT013200) but was separated due to changes in scope and schedule. This is a Consent Decree Rehabilitation Action Plan Phase II project.

A [location map](#) is included for clarification purposes.

**Funding Description:** The total project cost estimate of \$17,121,868 includes approximately \$196,495 in preliminary engineering phase services, \$1,326,000 in design phase services, \$20,000 in pre-construction phase services, \$12,155,000 in construction phase costs, and a 25 percent contingency allowance of \$3,424,373 and is based on a Class 5 CIP-prioritization level cost estimate prepared by Gannett Fleming, Inc. Engineering services will be completed by Gannett Fleming under the General Engineering Services annual services contract and the cost for preliminary engineering is below the \$200,000 Commission approval threshold.

<b>Schedule:</b>	PER	August 2022
	Design	September 2023
	Bid	November 2023
	Construction	January 2024
	Project Completion	May 2025

**Attachment:** #7

**Public Comment:** None

CID519999\_HRSD\_CFPF-2\_HMP

Applicant: Hampton Roads Sanitation District (HRSD)

Project Name: Dozier's Corner Pump Station Replacement

Supporting Documentation – Hazard Mitigation Plan

*A link to or a copy of the current hazard mitigation plan.*

Below are links to the Hampton Roads Planning District Commission (HRPDC) Hazard Mitigation Plan (HMP)

[2022 Hampton Roads Hazard Mitigation Plan | Hampton Roads, VA](#) or  
<https://www.hrpdcva.gov/400/2022-Hampton-Roads-Hazard-Mitigation-Pla>

HRSD's HMP was approved by Virginia Department of Emergency Management and FEMA (letter attached) and is included in the DCR approved HRSD Resilience Plan.

Attachment

One Independence Mall  
615 Chestnut Street, 6<sup>th</sup> floor  
Philadelphia, PA 19106-4404



**FEMA**

February 29, 2024

John Sadler  
Regional Emergency Management  
Administrator  
Hampton Roads Sanitation District  
723 Woodlake Drive  
Chesapeake, Virginia 23320

Community:	Hampton Roads Sanitation District, Virginia
PDC:	Hampton Roads
Plan Adoption Date:	02/07/2024
Plan Approval Date:	06/08/2022
Plan Expiration Date:	06/07/2027

Dear Administrator Sadler:

I am pleased to tell you that FEMA has approved your Hazard Mitigation Plan (HMP). The plan meets the requirements of Title 44, Chapter 1, Section 201.6, of the Code of Federal Regulations ([44 CFR 201.6](#)). It addresses the required elements: planning process, risk assessment and hazard identification, mitigation strategy, maintenance and implementation, and adoption.

Your HMP also met the requirements to address all dam risks, based on the Fiscal Year 2024 Rehabilitation of High Hazard Potential Dams (HHPD) Notice of Funding Opportunity.

Participating communities are now eligible for FEMA non-emergency assistance and mitigation grants from the following programs:

- [Hazard Mitigation Grant Program \(HMGP\)](#)
- [Building Resilient Infrastructure and Communities \(BRIC\)](#)
- [Flood Mitigation Assistance \(FMA\)](#)
- [HHPD Grant Program](#)

Funding from these programs can be used for qualified mitigation planning and projects that reduce disaster losses and protect life and property from future disasters. Approved HMPs can also earn points under the [Community Rating System](#).

Within 5 years, your community must revise its plan and obtain approval to remain eligible for mitigation grant funding. You should review the plan annually to keep it relevant to the mitigation goals in your community. Please consider the enclosed recommendations to further strengthen your plan during its next update.

I commend you and the planning team for your hard work and continued commitment to building a safer, more resilient community. For questions about your plan or mitigation grant funding, please contact Katie Vugdalic, State Hazard Mitigation Officer, at (804) 461-0242.

Sincerely,

A handwritten signature in black ink, appearing to read 'SW', is positioned above the typed name.

Sarah Wolfe, Branch Chief  
Floodplain Management and Insurance Branch  
FEMA Region 3

Enclosure

cc: Katie Vugdalic, State Hazard Mitigation Officer, VDEM  
Stacy McKinley, Hazard Mitigation Planner, VDEM  
Alexander Krupp, Deputy State Hazard Mitigation Officer, VDEM  
Chris Bruce, All Hazards Planner, Region 5, VDEM  
Ryan Radspinner, Engineer, HRSD  
Anas Malkawi, Chief of Asset Management, HRSD  
Tina Condon, Grand Analyst, HRSD

# Local Mitigation Plan Review Tool Annex

## Recommendations for Improvement



FEMA Region III


<b>Jurisdiction:</b> Hampton Roads PDC		<b>Title of Plan:</b> Hampton Roads Hazard Mitigation Plan	<b>Date of Plan:</b> 2022
<b>Element A: Planning Process</b>			
	<input checked="" type="checkbox"/>	Where available, local plans should be integrated into the mitigation plan and vice versa. This should be described in more depth in the next plan.	
	<input checked="" type="checkbox"/>	The next plan should describe the results of the yearly plan maintenance meetings described in the plan. The same process was described in the previous plan with limited discussion of that process in this plan.	
<b>Element B: Hazard Identification and Risk Assessment</b>			
	<input checked="" type="checkbox"/>	Provide more information about “Relative Social Vulnerability in the Study Area” to describe areas that have High or Relatively High Social Vulnerability since the map scale covers the entire region, making it difficult to distinguish those areas. It is recommended to create larger scale maps to better indicate location for flooding and coastal erosion/landslides. At the current scale, floodplains and hazardous areas are impossible to discern.	
	<input checked="" type="checkbox"/>	The Risk and Vulnerability Assessment needs to be reviewed for readability and consistency, particularly the description of the methodology of the vulnerability assessment. It should be revised so that a lay person can get a general understanding of what the author of the plan is trying to convey.	
	<input checked="" type="checkbox"/>	Add narrative to the HMP describing explicitly how the Virginia state dam safety agency ( <a href="#">Virginia Department of Conservation and Recreation</a> )—such as Mark Kilgore, a VADCR Dam Safety Engineer and member of this plan’s Hazard Mitigation Planning Steering Committee—coordinated with the jurisdiction and/or other local dam owners throughout the planning process.	
<b>Element C: Mitigation Strategy</b>			
	<input checked="" type="checkbox"/>	For all jurisdictions within the planning area, include detailed information on how participating communities manage the NFIP to ensure compliance with the local floodplain ordinance. Each floodplain manager should complete the NFIP Survey to identify how their communities are continuing to comply with floodplain requirements and regulations.	

## Local Mitigation Plan Review Tool Annex


### Recommendations for Improvement



FEMA Region III

	<input checked="" type="checkbox"/>	<p>Increase community-level interactions and risk-based discussions, by improving descriptions and connections between the outcome of the risk assessment/vulnerability analysis with non-regulatory Flood Risk Products and the mitigation strategy. Content should flow from problem identification (risk/vulnerability) to mitigation strategy (goals/objectives/actions).</p> <p>The revised plan should describe the systems or processes in place whereby local plans, ordinances, and programs are in place for a town but managed by the county</p>
---	-------------------------------------	---

#### Element D: Plan Review, Evaluation, and Implementation

	<input checked="" type="checkbox"/>	Utilize the 5-Year Planning Wheel, which reflects the continuous development, implementation and enhancement of your Hazard Mitigation Plan.
	<input checked="" type="checkbox"/>	Submit annual progress reviews and plan discussion to state and FEMA
Additional Comments		

## Local Mitigation Plan Review Tool Annex

### Recommendations for Improvement



FEMA Region III

	<input checked="" type="checkbox"/>	<p>HHPD2 and HHPD4: Add narrative explaining how vulnerable populations in Washington County are impacted by HHPD dam risk, or add a mitigation action to collect and analyze data to determine dam risk impacts to vulnerable populations throughout the county for the purpose of integrating the information into county plans (such as the hazard mitigation plan) to inform decision-making.</p>
	<input checked="" type="checkbox"/>	<p>Obtain the latest version of the FEMA: Region 3 High Hazard Potential Dams State and Local Mitigation Planning Tips Resource from FEMA Region 3 and/or State staff and use it to inform the development of the next plan update or ammendment.</p>





CID519999\_HRSD\_CFPF-2\_CompPlan

Applicant: Hampton Roads Sanitation District (HRSD)

Project Name: Dozier's Corner Pump Station Replacement

Supporting Documentation – Comprehensive Plan

*A link to or a copy of the current comprehensive plan.*

The proposed HRSD project is in the City of Chesapeake, and a link to Chesapeake's Comprehensive Plan is below:

<https://resources.cityofchesapeake.net/comp-plan-2035/#page=1>

CID519999\_HRSD\_CFPF-2\_Support\_Pledge

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station

#### Supporting Documentation – Ability to Provide Share of Costs

*Include supporting documents demonstrating the local government's ability to provide its share of the project costs. This must include an estimate of the total project cost, a description of the source of the funds being used, evidence of the local government's ability to pay for the project in full or quarterly prior to reimbursement, and a signed pledge agreement from each contributing organization.*

HRSD has A++ S&P and Fitch ratings and is committed to meeting its obligations and financial integrity. A letter from HRSD's Chief Financial Officer is attached and assures that HRSD has the ability and willingness to pay project costs while awaiting reimbursement. The project will be funded through HRSD CIP budget and any grant funds awarded.

The total cost for the Dozier's Corner Pump Station project is \$7,965,258. HRSD's CFPF grant application is for \$6,265,669, with a 15% match of \$1,105,706 paid by HRSD through pre-award procurement for contractual services, with approval from Virginia Department of Conservation and Recreation. HRSD will cover all costs that exceed the grant portion, estimated at \$593,883.

There are no financial contributions from other organizations; however, the City of Chesapeake provided a letter of support, attached in the application Supporting Documentation.

Attachment



November 26, 2024

Virginia Department of Conservation and Recreation  
Attention: Virginia Community Flood Preparedness Fund  
Division of Dam Safety and Floodplain Management  
600 East Main Street, 24<sup>th</sup> Floor  
Richmond, VA 23219

Re: Grant Application for the Virginia Community Flood Preparedness Fund Round 5

Dear Sir/Madam:

Hampton Roads Sanitation District (HRSD) is applying for the Community Flood Preparedness Fund for the Dozier's Corner Pump Station project. HRSD fully supports the project, and it has been approved in the FY 2025 Capital Improvement Plan by the HRSD Commission, our governing body.

The total grant project budget is \$7,371,375. HRSD is applying for \$6,265,669 through the CFPF grant, and commits to a \$1,105,706 match (15%). The budgeted match consists of contractual services to be procured pre-award with approval from Virginia DCR. The completed project is currently estimated to cost \$7,965,258. HRSD will pay for the property acquisition necessary for this project and estimated at \$590,000, as well as other costs above the grant proposal amount. While HRSD has the liquidity to finance the project, it is awaiting the grant award notice before proceeding with the appropriation.

Thank you for this opportunity to apply for funding for this important project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Steve de Mik', is written over a light blue horizontal line.

Steve de Mik  
Chief Financial Officer



# **HRSD DOZIER'S CORNER PUMP STATION REPLACEMENT CIP# AT015400 ALTERNATIVES EVALUATION WORKSHOP**

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November 14, 2023

# Agenda

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- Introductions
- Purpose
  - Identify relocation and replacement options, including replacing in existing location, and addressing flood protection and hardening.
- Scope of Work
  - Preliminary Engineering Report (PER)
    - Kickoff Meeting, Existing Pump Station Site Visit, Existing Survey - ✓
    - Alternatives Exploration Workshop - August 30th - ✓
    - Alternatives Evaluation Workshop - November 14th
    - Technical Memorandum
    - PER
- Selected Alternatives Discussion
- Alternatives Ranking Matrix Discussion - Evaluation
- Schedule and Next Steps

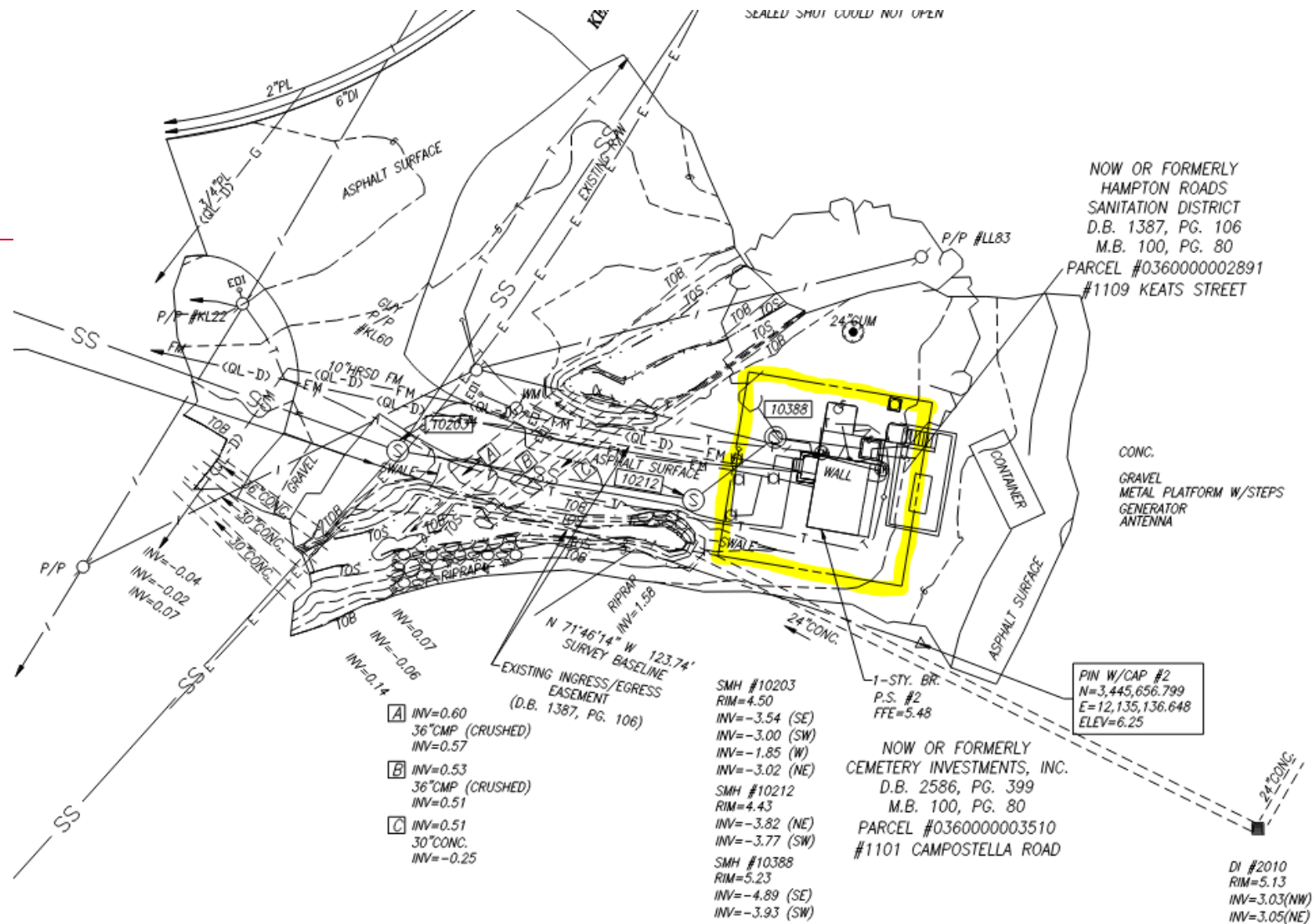
# Project Issues

- Project Scope as listed in CIP
  - Install dry pit submersible pumps and raise or otherwise protect electrical equipment at Dozier's Corner Pump Station.
  - Construction complete by May 2027
- Chesapeake flood elevation freeboard design criteria exceed FEMA flood elevations
  - New construction or substantial improvement of any building shall have the lowest floor, including basement, elevated one and one-half feet above the base flood level. Buildings may be flood-proofed provided that all areas of the building below the BFE, plus two feet, are watertight with walls substantially impermeable to the passage of water, and have the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy
- Minimum property dimensions for a new PS are 150 feet X 150 feet





## Existing Site Survey



## SITE PLAN

SCALE: 1"=20'

# Alternative Exploration Workshop Meeting Summary

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- Purpose: Brainstorm, discuss, and review alternative options for the pump station, including the existing pump station site as an alternative
- Goal: Present all the various alternative options that GF has for the pump station, then discuss which six options are the best ones to continue further evaluation
- Scope: Alternatives exploration workshop, alternatives evaluation stage, technical memorandum summarizing the selected alternative, and culminating with a preliminary engineering report
- Existing pump station finished floor elevation is 5.48'. Building code requirement for the City of Chesapeake is 11'. Dozier's Corner shall be a foot and a half above flood elevation
- Heavy flooding at Dozier's. Pumps need to be rebuilt after each Nor'easter. Dry pit submersible or submersible station possible solutions
- Considering giving Dozier's to the city of Chesapeake
- Maximum limit of sewer depth to consider is 16', 10' deep HRSD can maintain their own equipment
- Gasketed hatches tend to seal themselves under the weight of flood water. Usually no impacts to pump operations during flood events due to hatch inflow
- LiDAR elevation data for the area reviewed



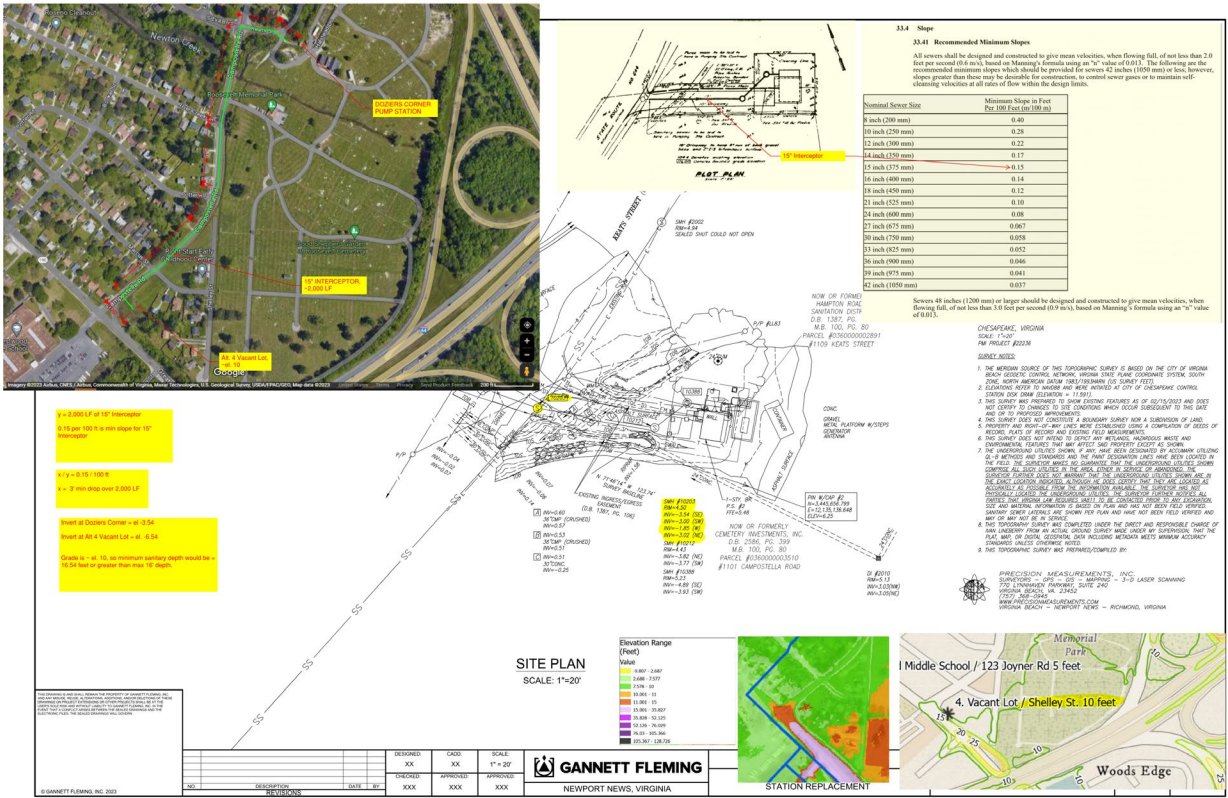
# Alternatives Exploration Workshop Meeting - Selected Alternatives

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**Kept**  
**Rejected**  
**\* Kept but Rejected after  
Exploration meeting**

- **Alternative 1: Existing Pump Station Site**
- Alternative 2: Vacant Lot at S Eva Blvd
- **Alternative 3: Vacant Lot at 500 Oneal Ln (Cemetery Laydown Area)**
- **Alternative 4: Vacant Lot at Great Bridge Blvd and Campostella\***
- Alternative 5: Home for Sale 618 Tuskegee Ave
- Alternative 5A: Home for Sale at 302 Carver St
- Alternative 5B: Home for Sale at 724 River Creek Rd
- **Alternative 5C: Home for Sale at 1221 Keats Sta\***
- **Alternative 6: Roosevelt Memorial Park Cemetery (Cemetery Area adjacent to existing Pump Station)**
- Alternative 7: Crestwood Middle School
- Alternative 8: DOT ROW
- **Additional Alternatives Proposed during Meeting: ROW of Campostella, submersible station, north of I-464**

# Alternatives Eliminated after Exploration Meeting





# Previously Proposed Siting Alternatives

**Kept**

**Rejected**

**\* Kept but Rejected after  
Exploration meeting**

**1: Existing Pump Station**

2: Vacant Lot / S Eva Blvd

**3: Vacant Lot / 500 Oneal Ln**

**4: Vacant Lot / Great Bridge  
Blvd and Campostella\***

5: Home for Sale 618 Tuskegee  
Avenue

5A: Home for sale 302 Carver St

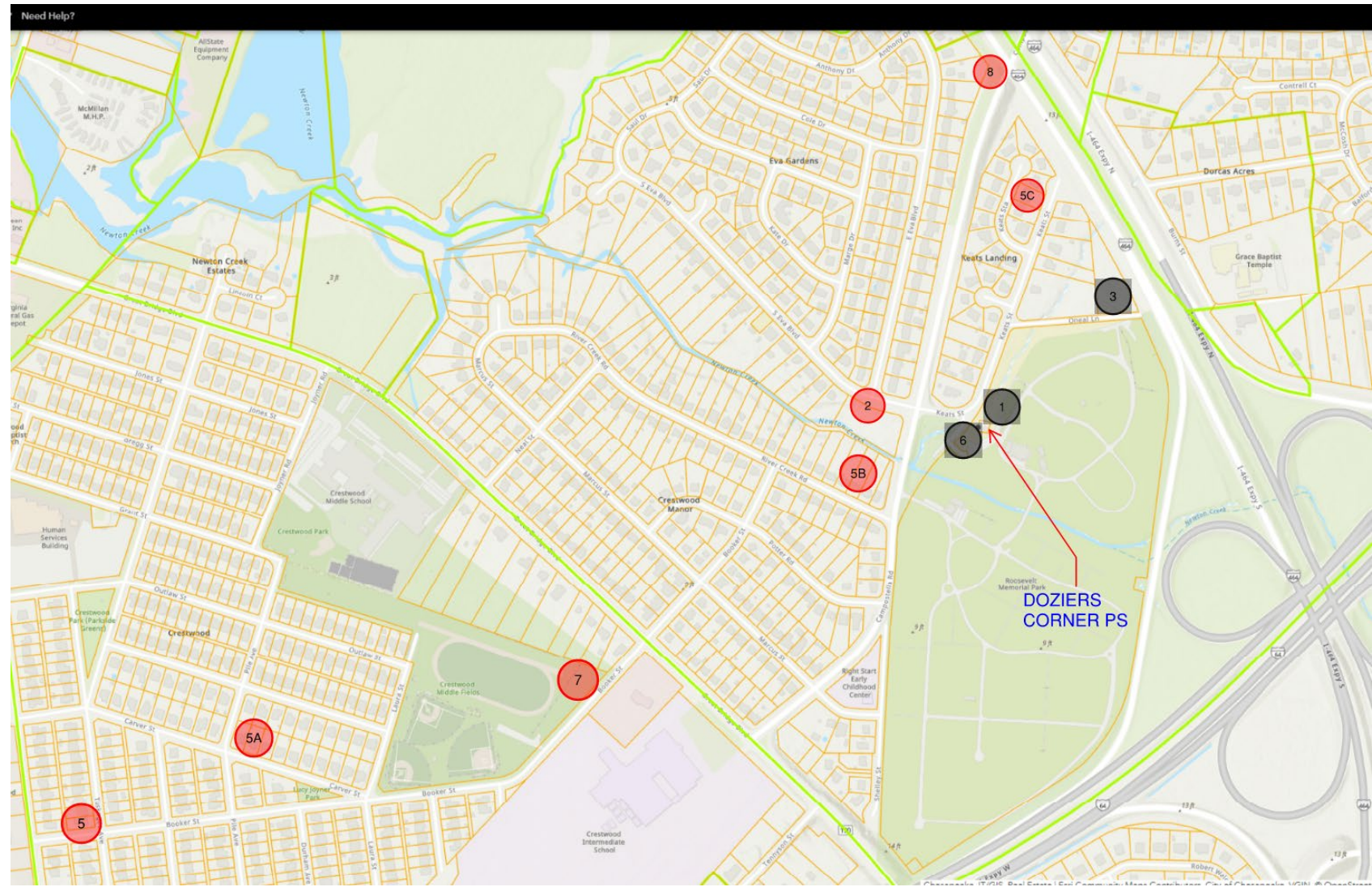
5B: Home for sale 724 River Creek  
Rd

**5C: 1221 Keats Sta\***

**6: Roosevelt Memorial Park  
Cemetery**

7: Crestwood Middle School

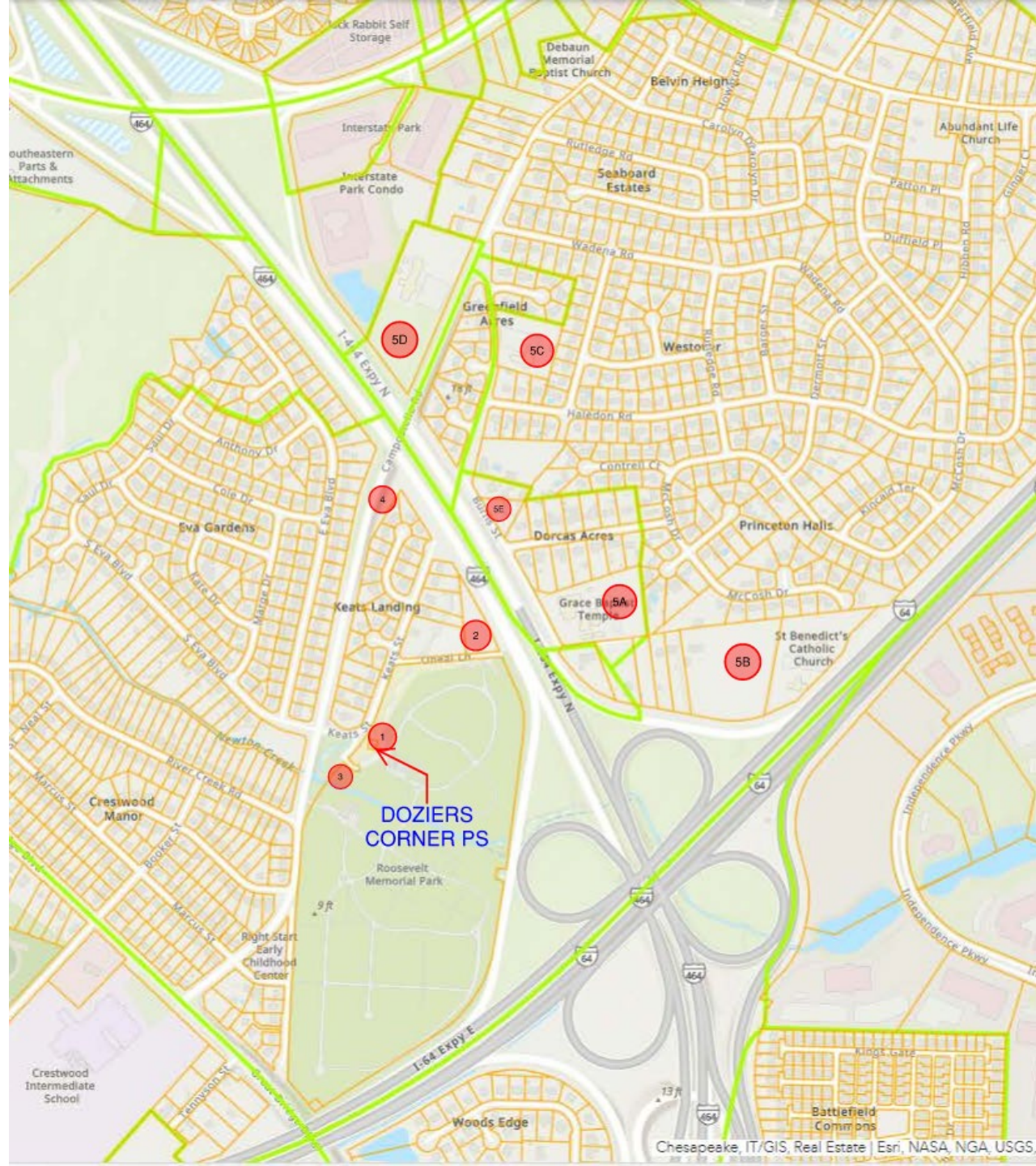
8: VDOT ROW





# Selected Alternatives

- 1- Existing Pump Station (1109 Keats St)
  - **1A – Submersible PS - Existing Pump Station (1109 Keats St)**
- 2 - Vacant Lot (500 Oneal Lane)
  - **2A – Submersible PS - Vacant Lot (500 Oneal Lane)**
- 3 – Roosevelt Memorial Park Cemetery (1101 Campostella Rd)
- **4 – ROW of Campostella**
- **5A – Baptist Temple (1101 Burns St)**
- **5B – Catholic Church (1016 Burns St)**
- **5C – Refresh Community Church (1313 Burns St)**
- **5D – Baptist Church (1316 Campostella Rd)**
- **5E – Home on Burns St – 1205 Burns St**

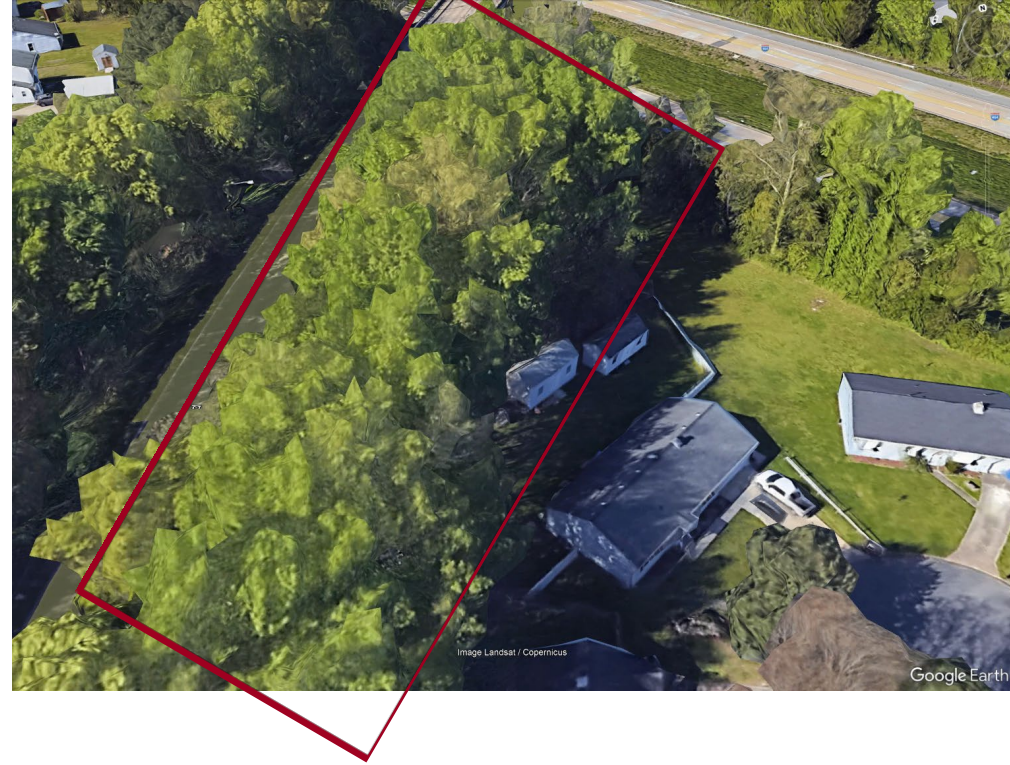




## Alternative 4: ROW of Campostella

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- Owner's Name:  
N/A, Potentially City of Chesapeake ROW
- Property Address (Primary):  
N/A
- Mailing Address:  
N/A
- Zoning: R8S- Residential
- Parcel Number: 5555555555555
- Total Assessment: N/A
- Acreage: 9.013 (entire parcel). 0.81 ac
- Dimensions: 355' x 100'
- Elevation: 9'





# National Flood Hazard Layer FIRMMette



76°16'42"W 36°46'22"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 76°16'42"W 36°45'53"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

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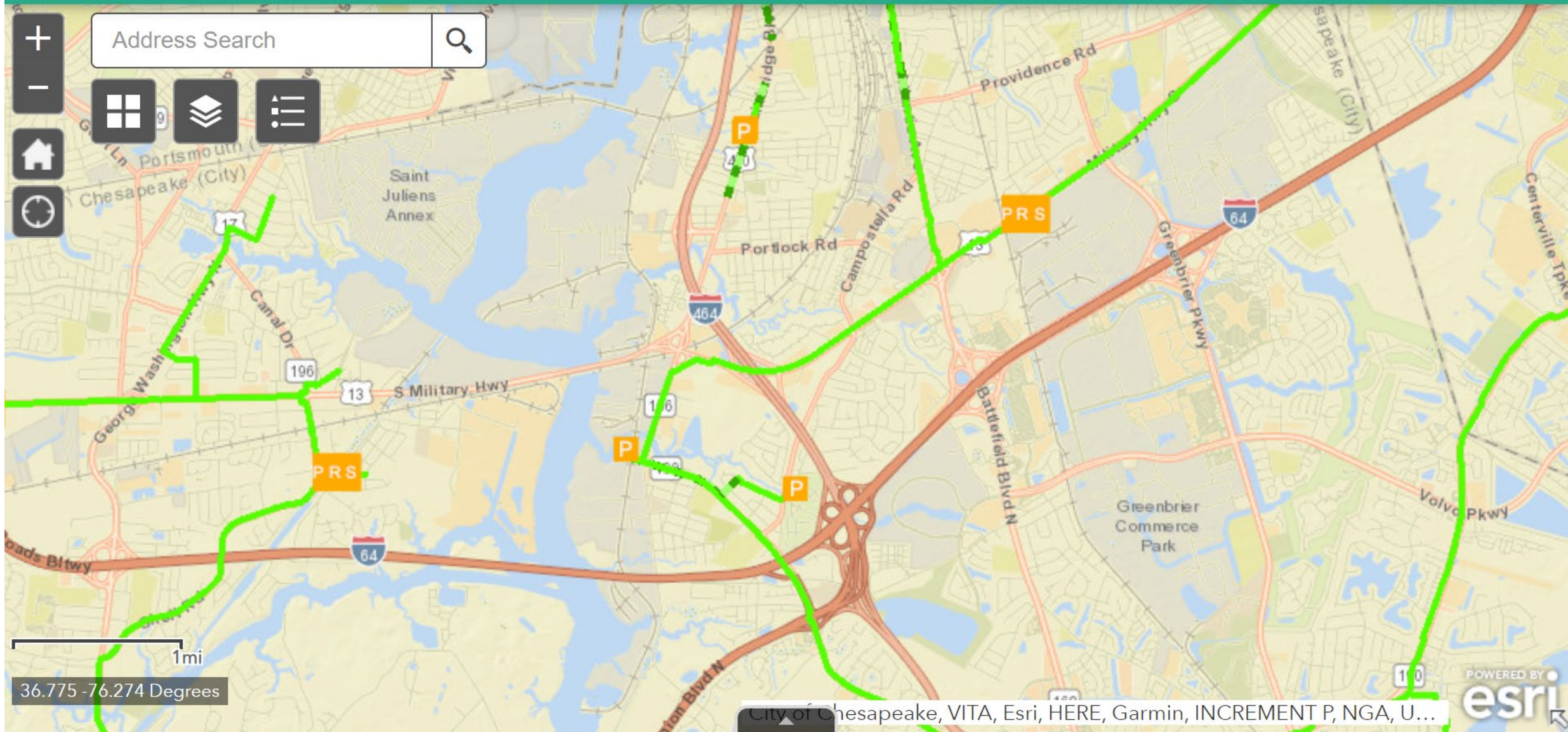


# HRSD Public Map

Hampton Roads Sanitation District



Address Search



36.775 -76.274 Degrees

City of Chesapeake, VITA, Esri, HERE, Garmin, INCREMENT P, NGA, U...





## Alternative 5A: Baptist Temple

- Owner's Name:  
Grace Baptist Temple
- Property Address (Primary):  
1101 Burns St Chesapeake, 23320
- Mailing Address:  
1101 Burns St Chesapeake, 23320
- Zoning:  
R15: Residential
- Parcel Number:  
0270000000301
- Total Assessment:  
\$5,763,000
- Acreage: 4.89
- Dimensions 379' x 152':
- Elevation: 12'

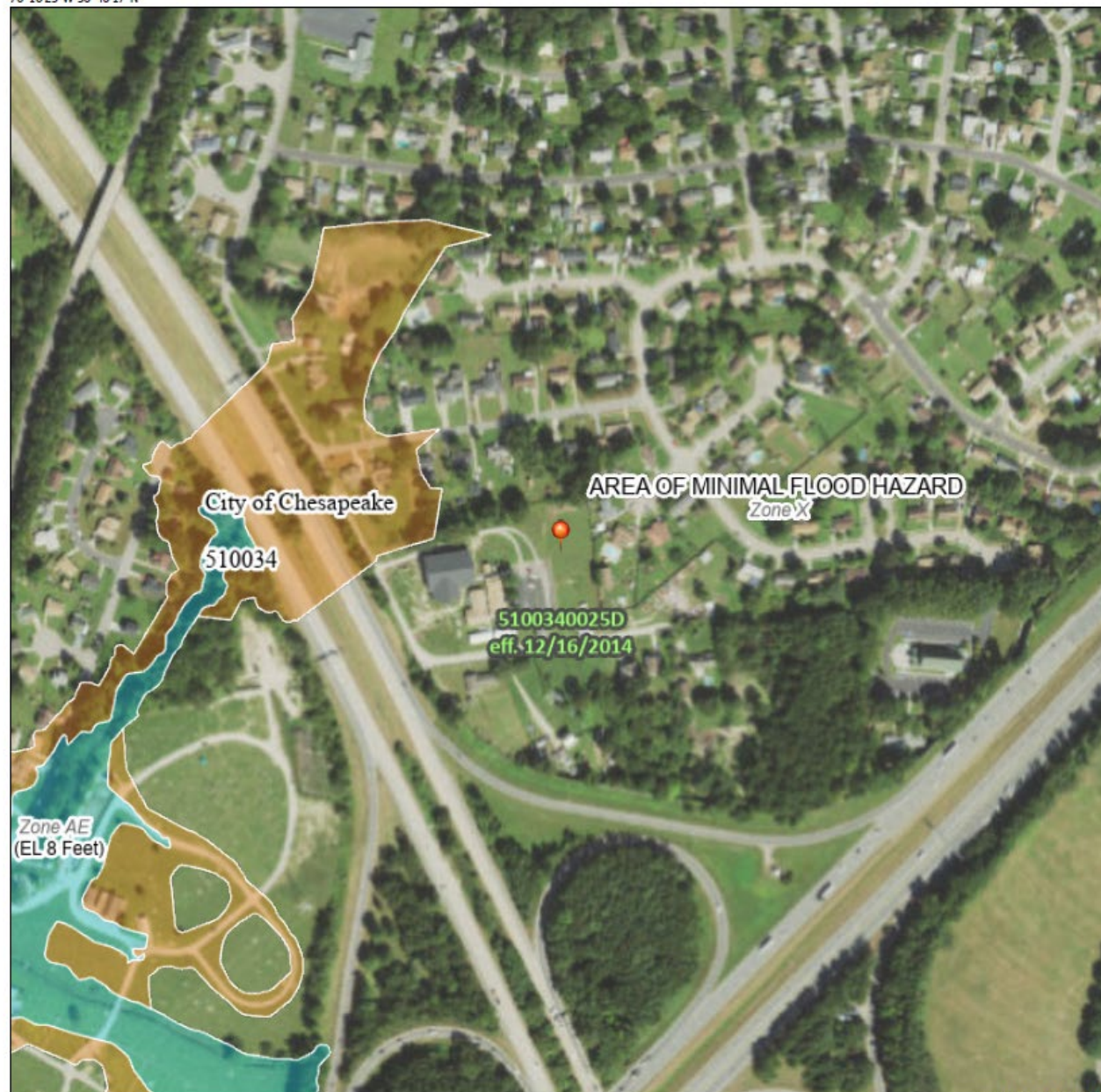




# National Flood Hazard Layer FIRMMette



76°16'25"W 36°46'17"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

76°15'48"W 36°45'48"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes, Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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## Alternative 5B: Catholic Church

- Owner's Name:  
Knestout Barry C Bishop of Catholic Diocese of Richmond VA
- Property Address (Primary):  
1016 Burns St Chesapeake, 23320
- Mailing Address:  
521 McCosh Dr Chesapeake, 23320
- Zoning: R8S: Residential
- Parcel Number: 0270000000320
- Total Assessment:  
\$473,200
- Acreage: 5.893
- Dimensions: 555' x 364'
- Elevation: 15'





# National Flood Hazard Layer FIRMette



76°16'16"W 36°46'13"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 76°15'39"W 36°45'44"N  
Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
	The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.	

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

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# Alternative 5C: Refresh Community Church

- Owner's Name:  
Higher Life Ministries Inc
- Property Address (Primary):  
1313 Burns St Chesapeake, 23320
- Mailing Address:  
1313 Burns St Chesapeake, 23320
- Zoning: R8S: Residential
- Parcel Number: 0271004000021
- Total Assessment:  
\$696,400
- Acreage: 2.408
- Dimensions: 100' x 365'
- Elevation: 8'

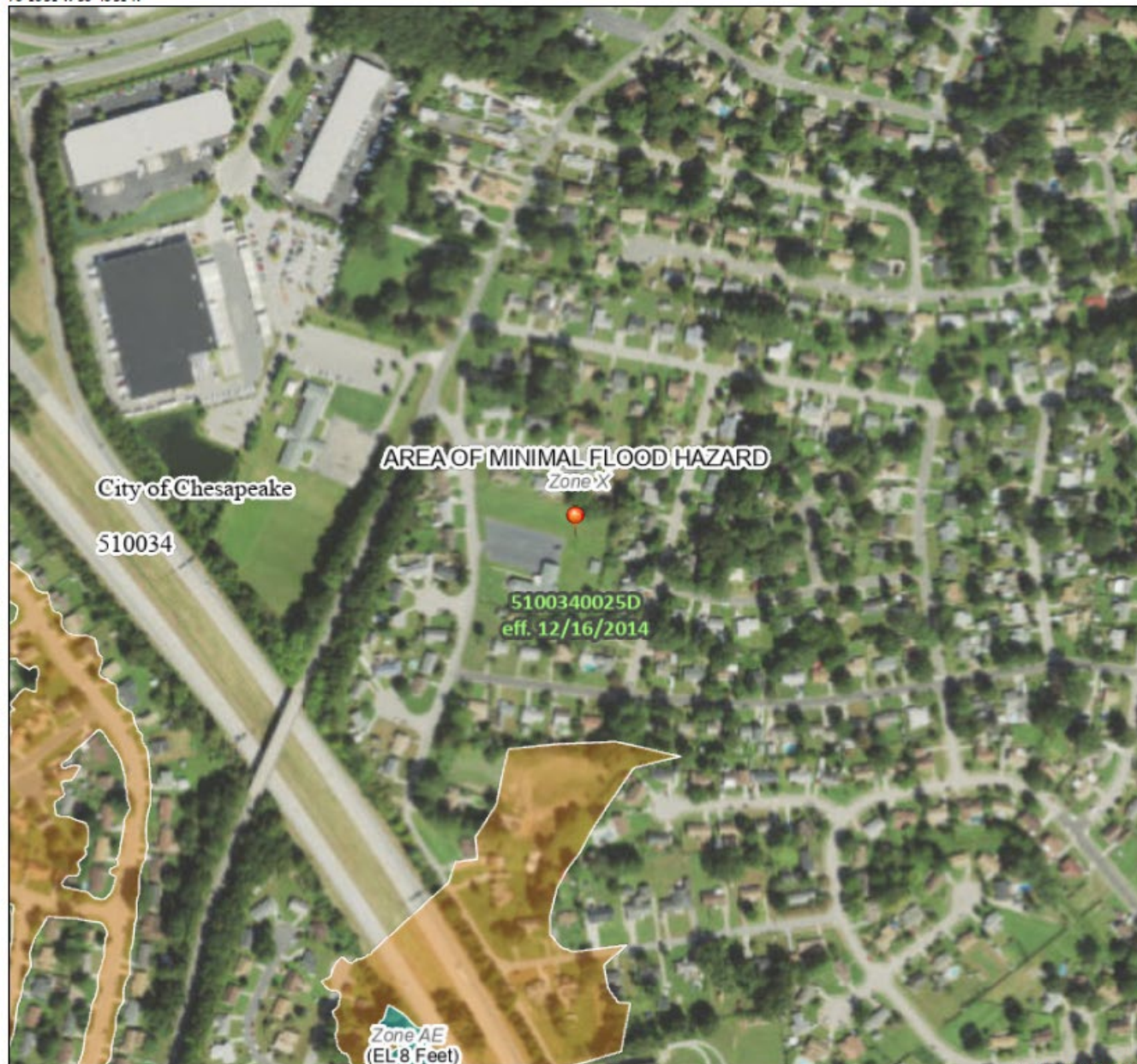




# National Flood Hazard Layer FIRMMette



76°16'31"W 36°46'31"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

76°15'54"W 36°46'2"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard. Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation 17.5 Coastal Transect Base Flood Elevation Line (BFE) Limit of Study Jurisdiction Boundary Coastal Transect Baseline Profile Baseline Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

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# Alternative 5D: Baptist Church

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- Owner's Name:  
Tidewater Baptist Church Trustees
- Property Address (Primary):  
1316 Campostella Chesapeake, 23320
- Mailing Address:  
1316 Campostella Rd Chesapeake, 23320
- Zoning: O-I: Office and Institutional
- Parcel Number: 0270000000021
- Total Assessment:  
\$1,310,000
- Acreage: 6.108
- Dimensions: 350' x 332'
- Elevation: 9'

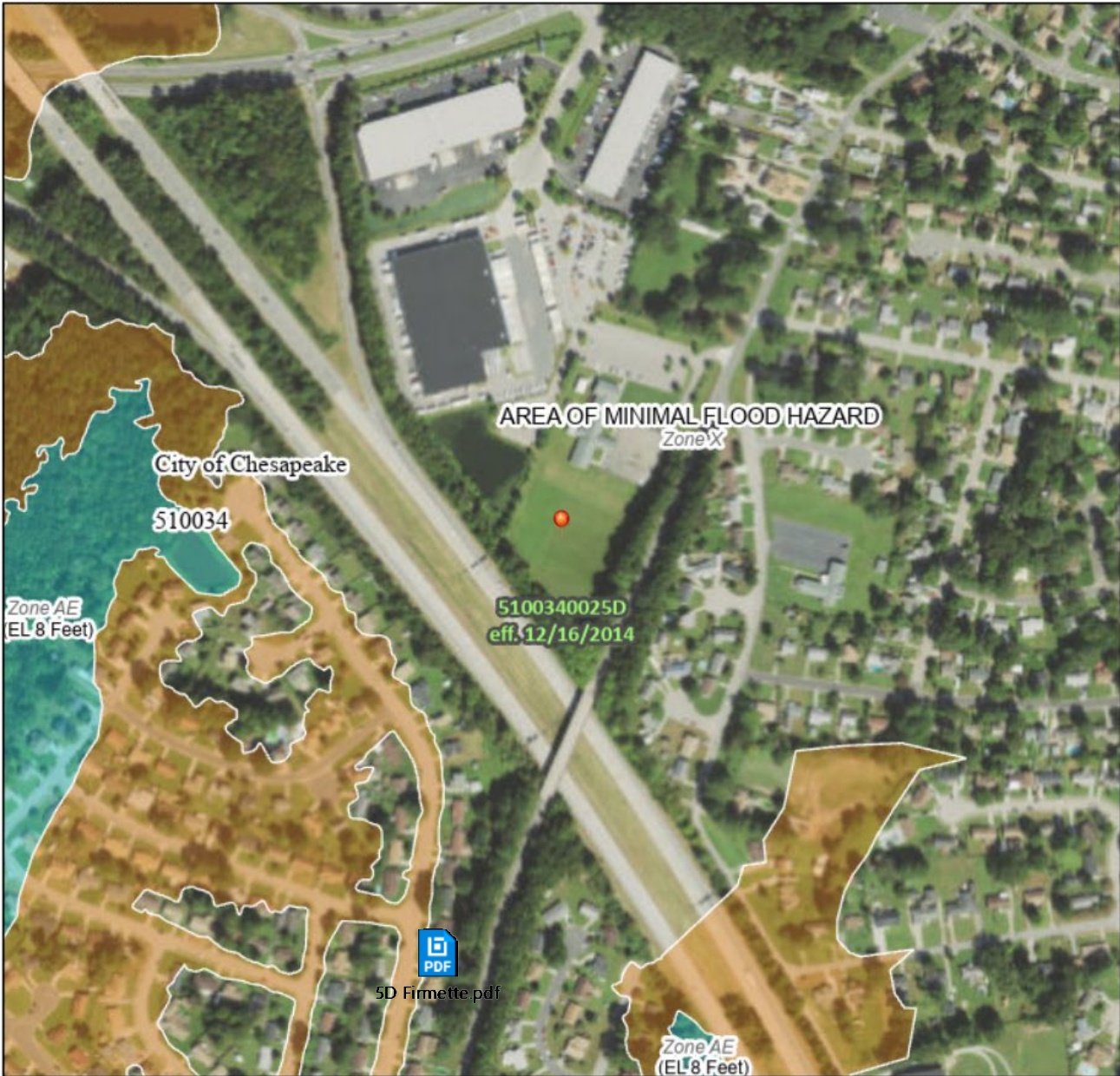




# National Flood Hazard Layer FIRMette



76°16'41"W 36°46'31"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 76°16'41"W 36°46'31"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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## Alternative 5E: Home on Burns St

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- Owner's Name:  
Taylor Antoinette
- Property Address (Primary):  
1205 Burns St Chesapeake, 23320
- Mailing Address:  
1205 Burns St Chesapeake, 23320
- Zoning:  
R-15: Residential
- Parcel Number: 0271007000002
- Total Assessment:  
\$217,000
- Acreage: 0.45
- Dimensions: 95' x 90'
- Elevation: 11'

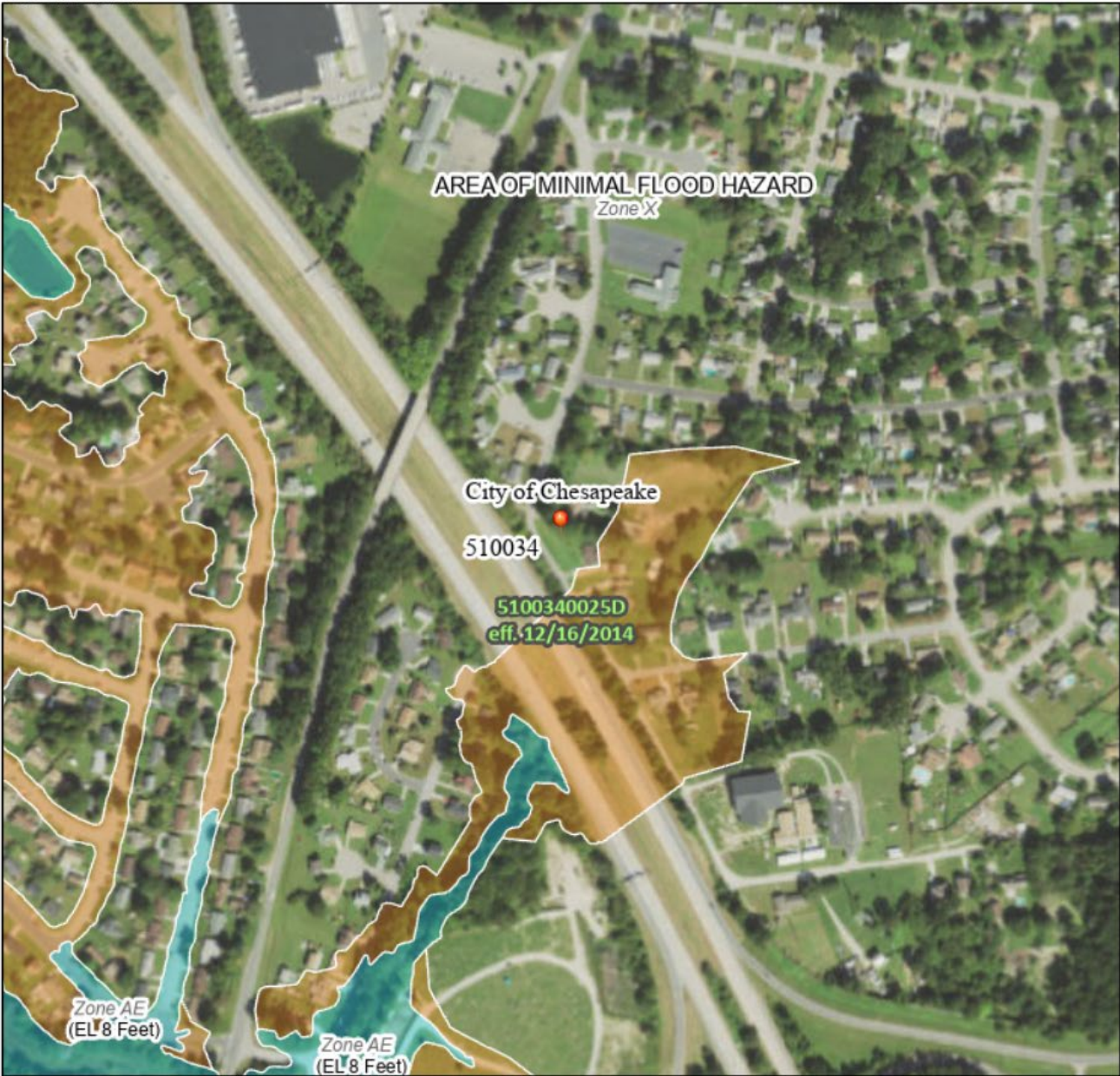




# National Flood Hazard Layer FIRMette



76°16'36"W 36°46'23"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 76°15'58\"/>

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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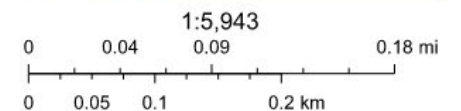
# HRSD GES Dozier Corner Pump Station Replacement

## Site Elevation

### LEGEND (FT)



10/20/2023



Esri Community Maps Contributors, City of Chesapeake, VGIN, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph,

# Depth Calculations

Alternative	Total LF	Elevation Drop	Grade Elevation at Alternative	Minimum Required Depth	Notes:
OLD Alt. 4 - Great Bridge Blvd & Campostella	2000	3.00	10	<b>16.54</b>	Eliminated after Alt. Exploration Mtg.
Alt. 2 - Oneal (Cemetery Laydown)	1060	1.59	12	<b>17.13</b>	Over 16' sewer depth.
Alt. 3 - Roosevelt	65	0.10	7	<b>10.64</b>	
Alt. 4 - Campostella ROW	1775	2.66	9	<b>15.20</b>	Estimated elevation, difficult to discern
Alt. 5A - Baptist Temple	1865	4.10	12	<b>13.93</b>	Using Manhole Invert of 2.17 per as-built
Alt. 5B - Catholic Church	2335	5.14	15	<b>17.97</b>	Using Manhole Invert of 2.17 per as-built
Alt. 5C - Refresh Community Church	1225	2.70	8	<b>8.53</b>	Using Manhole Invert of 2.17 per as-built
Alt. 5D - Baptist Church	2080	4.58	9	<b>11.41</b>	Using Manhole Invert of 2.17 per as-built
Alt. 5E - Home on Burns Street	120	0.26	11	<b>9.09</b>	Using Manhole Invert of 2.17 per as-built

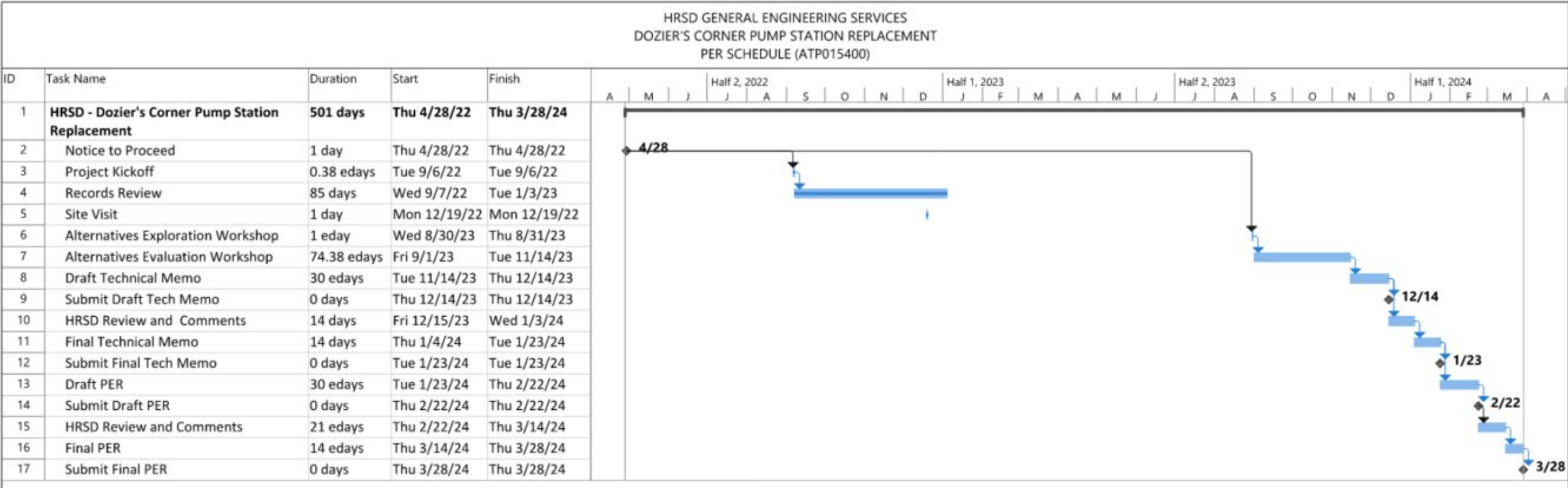
- 12 inch: Min Slope in Feet per 100 Feet – 0.22
- 15 inch: Min Slope in Feet per 100 Feet – 0.15

# Alternatives Evaluation Matrix Review

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# Schedule





ADDITIONAL COMMENTS OR QUESTIONS?

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# Alternative 1 (and 1A): Existing PS Site

---

- Owner's Name:

HRSD

- Property Address (Primary):

1109 Keats St Chesapeake, VA 23320

- Mailing Address:

1436 Air Rail Ave Virginia Beach, VA 23455-3002

- Zoning: R8S- Residential
- Parcel Number: 0360000002891
- Total Assessment:\$185,900.00
- Acreage: 0.037
- Dimensions: 49' x 49'
- Elevation: 6'

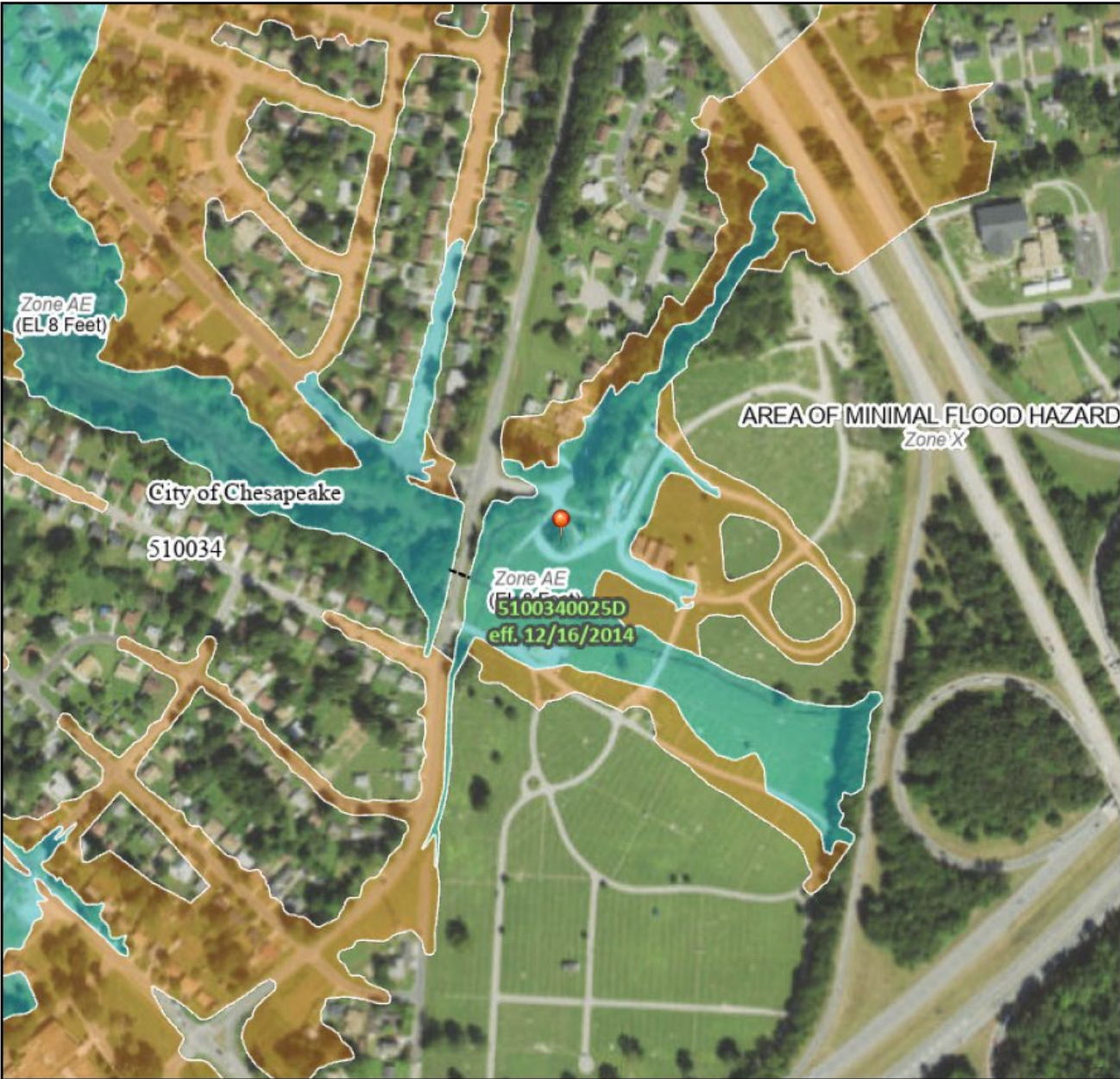




# National Flood Hazard Layer FIRMMette



76°16'44"W 36°46'8"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000  
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, culvert, or Storm Sewer
		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
MAP PANELS		No Digital Data Available
		Unmapped

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## Alternative 2 (and 2A): Vacant Lot / 500 Oneal Ln

---

- Owner's Name:  
Cemetery Investments Inc
- Property Address (Primary):  
500 Oneal Lane Chesapeake, VA 23320
- Mailing Address:  
5714 Roosevelt Memorial Park 3600 Horizon  
Blvd STE 100 Trevose, PA 19053-4965
- Zoning: R8S- Residential
- Parcel Number: 02700000000300
- Total Assessment:  
\$42,400.00
- Acreage: 1.29
- Dimensions: 175' x 445'
- Elevation: 12'





# National Flood Hazard Layer FIRMMette



76°16'35"W 36°46'14"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000  
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual chance Water Surface Elevation
MAP PANELS		Digital Data Available
		No Digital Data Available
MAP PANELS		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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# Alternative 3: Roosevelt Memorial Park Cemetery

---

- Owner's Name:  
Cemetery Investments Inc
- Property Address (Primary):  
1101 Campostella Road
- Mailing Address:  
Stonemor Operating LLC 3600 Horizon Blvd  
#100 FSTRVL TRVOSE, PA 19053-4965
- Zoning: R8S- Residential
- Parcel Number: 0360000003510
- Total Assessment: \$1,535,600.00
- Acreage: 50.416
- Dimensions: 150' x 150'
- Elevation: 7'

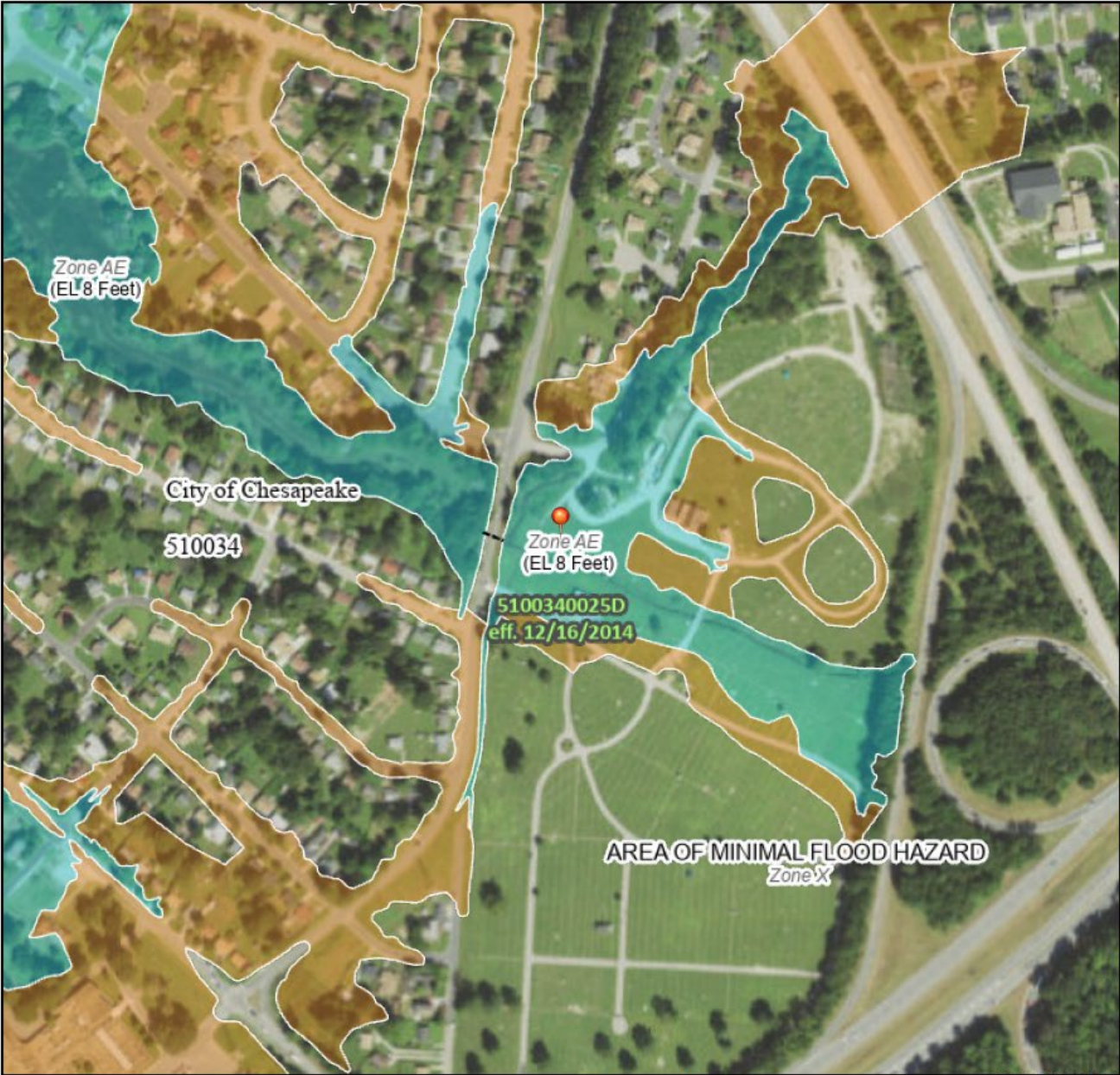




# National Flood Hazard Layer FIRMette



76°16'45"W 36°46'7"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000  
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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# **HRSD DOZIER'S CORNER PUMP STATION REPLACEMENT CIP# AT015400 ALTERNATIVES EVALUATION WORKSHOP**

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November 14, 2023

# Agenda

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- Introductions
- Purpose
  - Identify relocation and replacement options, including replacing in existing location, and addressing flood protection and hardening.
- Scope of Work
  - Preliminary Engineering Report (PER)
    - Kickoff Meeting, Existing Pump Station Site Visit, Existing Survey - ✓
    - Alternatives Exploration Workshop - August 30th - ✓
    - Alternatives Evaluation Workshop - November 14th
    - Technical Memorandum
    - PER
- Selected Alternatives Discussion
- Alternatives Ranking Matrix Discussion - Evaluation
- Schedule and Next Steps



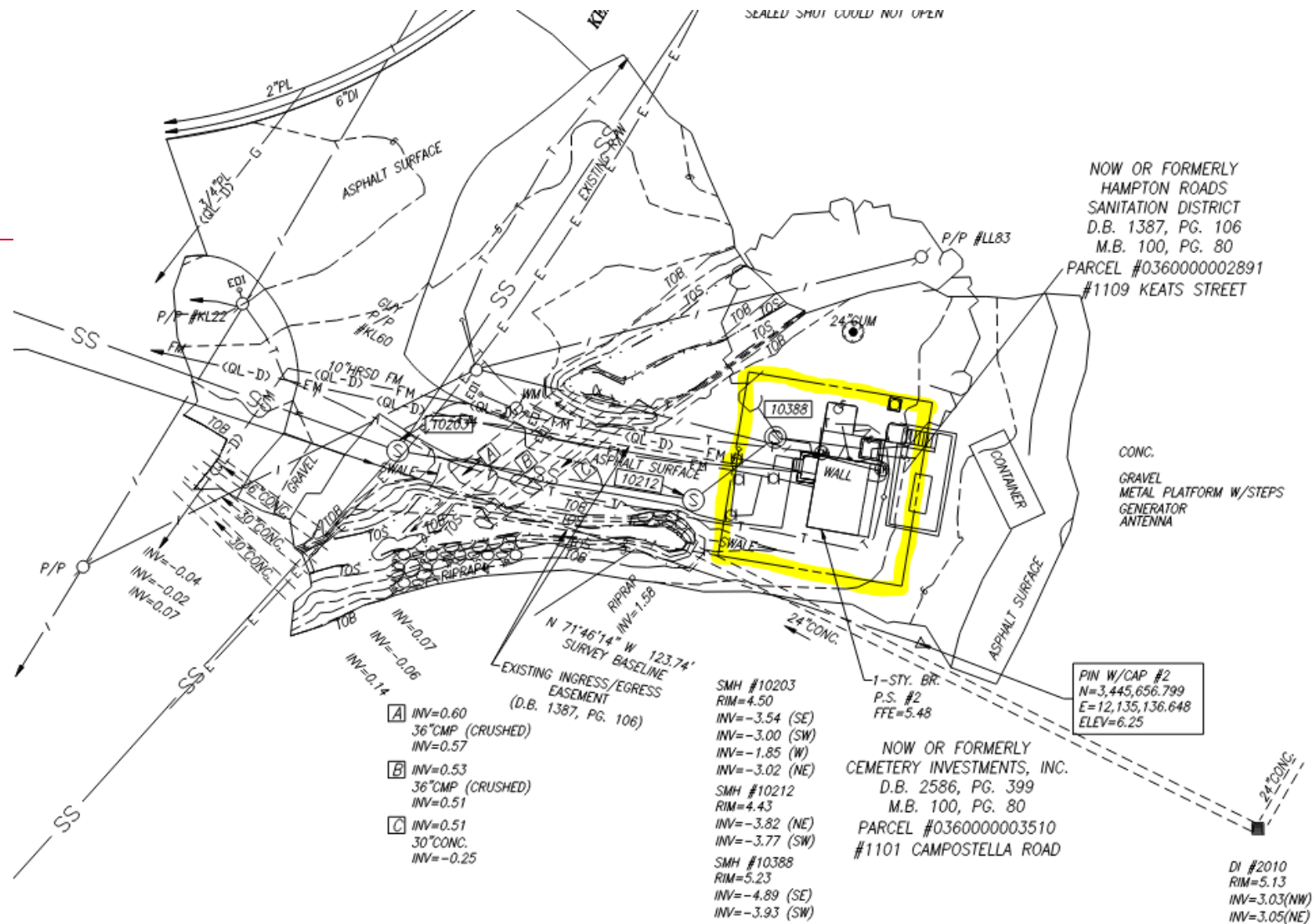
# Project Issues

- Project Scope as listed in CIP
  - Install dry pit submersible pumps and raise or otherwise protect electrical equipment at Dozier's Corner Pump Station.
  - Construction complete by May 2027
- Chesapeake flood elevation freeboard design criteria exceed FEMA flood elevations
  - New construction or substantial improvement of any building shall have the lowest floor, including basement, elevated one and one-half feet above the base flood level. Buildings may be flood-proofed provided that all areas of the building below the BFE, plus two feet, are watertight with walls substantially impermeable to the passage of water, and have the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy
- Minimum property dimensions for a new PS are 150 feet X 150 feet





## Existing Site Survey



## SITE PLAN

SCALE: 1"=20'

# Alternative Exploration Workshop Meeting Summary

---

- Purpose: Brainstorm, discuss, and review alternative options for the pump station, including the existing pump station site as an alternative
- Goal: Present all the various alternative options that GF has for the pump station, then discuss which six options are the best ones to continue further evaluation
- Scope: Alternatives exploration workshop, alternatives evaluation stage, technical memorandum summarizing the selected alternative, and culminating with a preliminary engineering report
- Existing pump station finished floor elevation is 5.48'. Building code requirement for the City of Chesapeake is 11'. Dozier's Corner shall be a foot and a half above flood elevation
- Heavy flooding at Dozier's. Pumps need to be rebuilt after each Nor'easter. Dry pit submersible or submersible station possible solutions
- Considering giving Dozier's to the city of Chesapeake
- Maximum limit of sewer depth to consider is 16', 10' deep HRSD can maintain their own equipment
- Gasketed hatches tend to seal themselves under the weight of flood water. Usually no impacts to pump operations during flood events due to hatch inflow
- LiDAR elevation data for the area reviewed

# Alternatives Exploration Workshop Meeting - Selected Alternatives

---

Kept

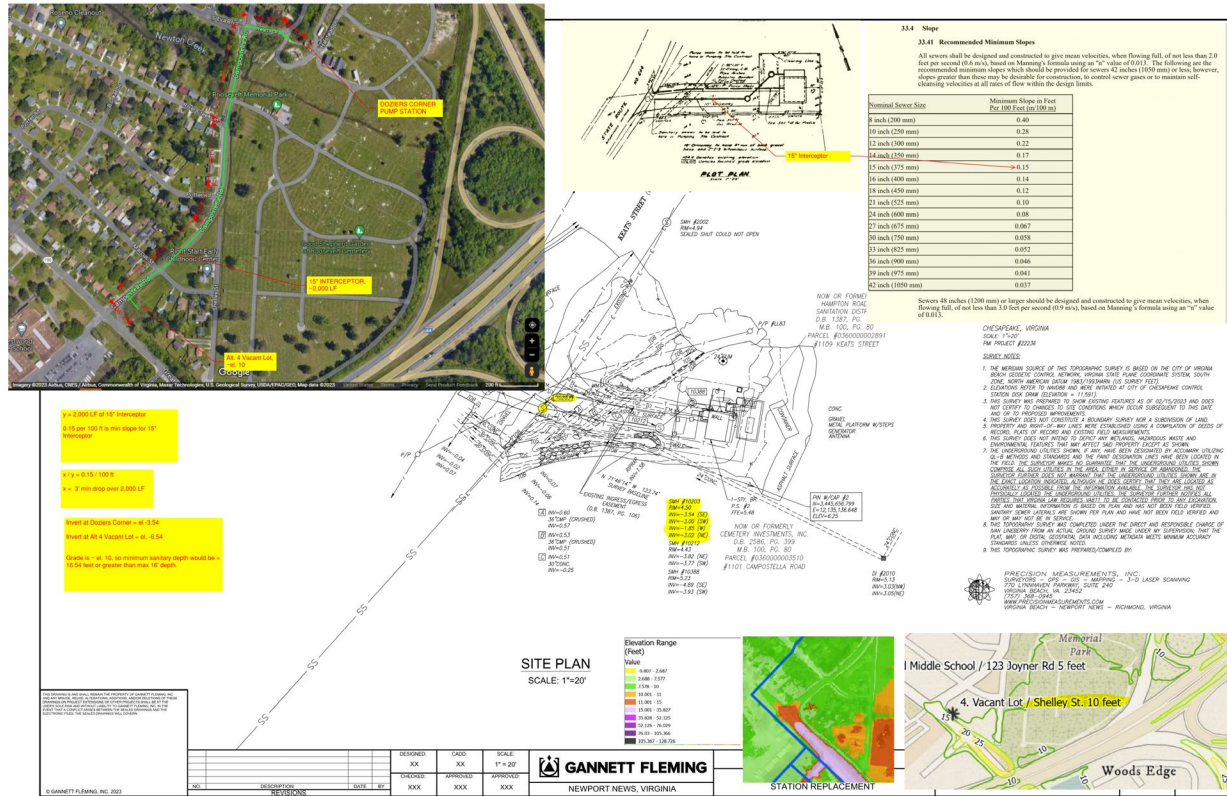
Rejected

**\* Kept but Rejected after  
Exploration meeting**

- **Alternative 1: Existing Pump Station Site**
- Alternative 2: Vacant Lot at S Eva Blvd
- **Alternative 3: Vacant Lot at 500 Oneal Ln (Cemetery Laydown Area)**
- **Alternative 4: Vacant Lot at Great Bridge Blvd and Campostella\***
- Alternative 5: Home for Sale 618 Tuskegee Ave
- Alternative 5A: Home for Sale at 302 Carver St
- Alternative 5B: Home for Sale at 724 River Creek Rd
- **Alternative 5C: Home for Sale at 1221 Keats Sta\***
- **Alternative 6: Roosevelt Memorial Park Cemetery (Cemetery Area adjacent to existing Pump Station)**
- Alternative 7: Crestwood Middle School
- Alternative 8: DOT ROW
- **Additional Alternatives Proposed during Meeting: ROW of Campostella, submersible station, north of I-464**



## Alternatives Eliminated after Exploration Meeting



Hydraulic calculations revealed Alternative 4 sewer depth would exceed 16'



The home in alternative 5C was discovered to be under contract



# Previously Proposed Siting Alternatives

**Kept**

**Rejected**

**\* Kept but Rejected after  
Exploration meeting**

**1: Existing Pump Station**

2: Vacant Lot / S Eva Blvd

**3: Vacant Lot / 500 Oneal Ln**

**4: Vacant Lot / Great Bridge  
Blvd and Campostella\***

5: Home for Sale 618 Tuskegee  
Avenue

5A: Home for sale 302 Carver St

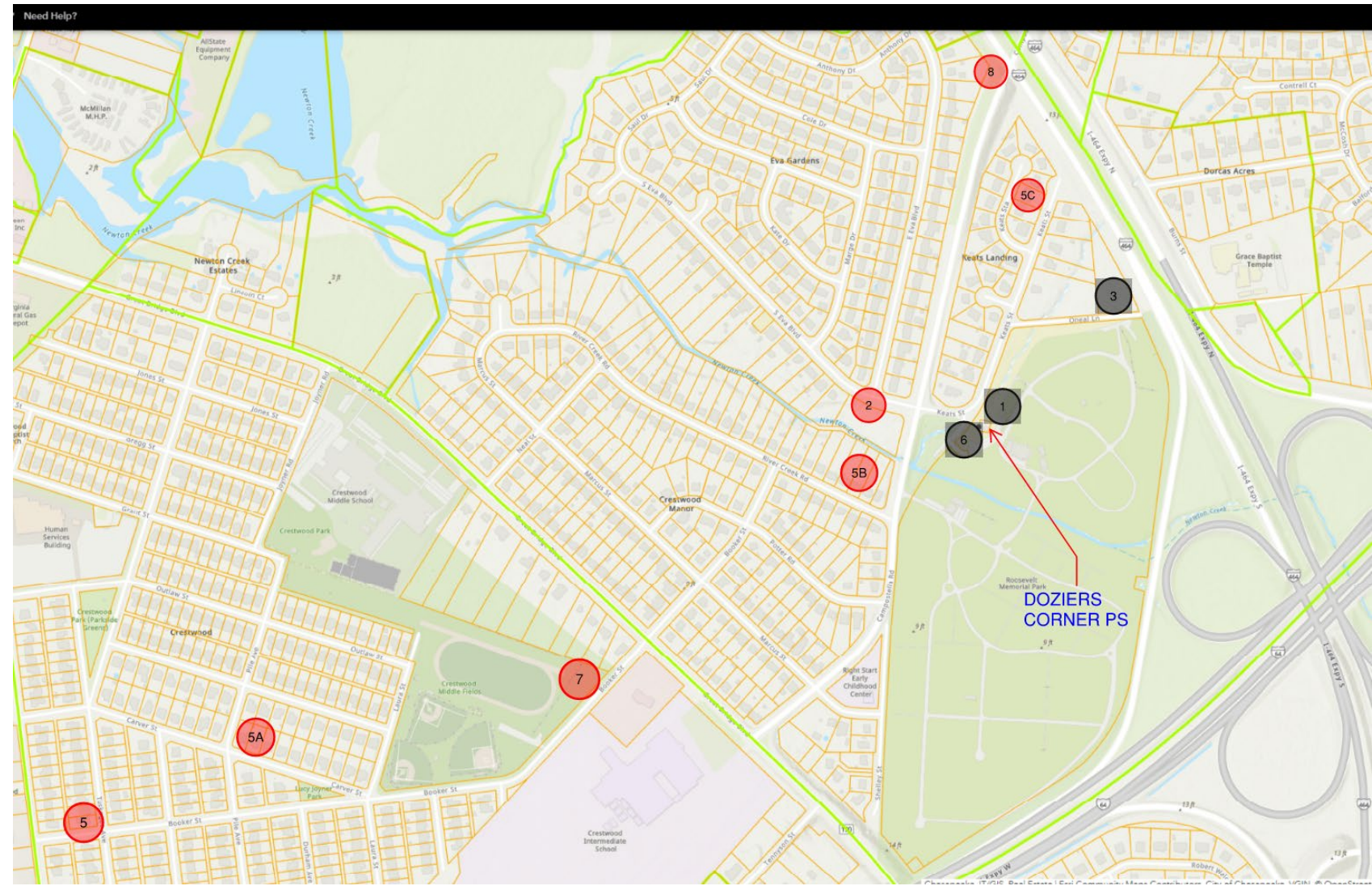
5B: Home for sale 724 River Creek  
Rd

**5C: 1221 Keats Sta\***

**6: Roosevelt Memorial Park  
Cemetery**

7: Crestwood Middle School

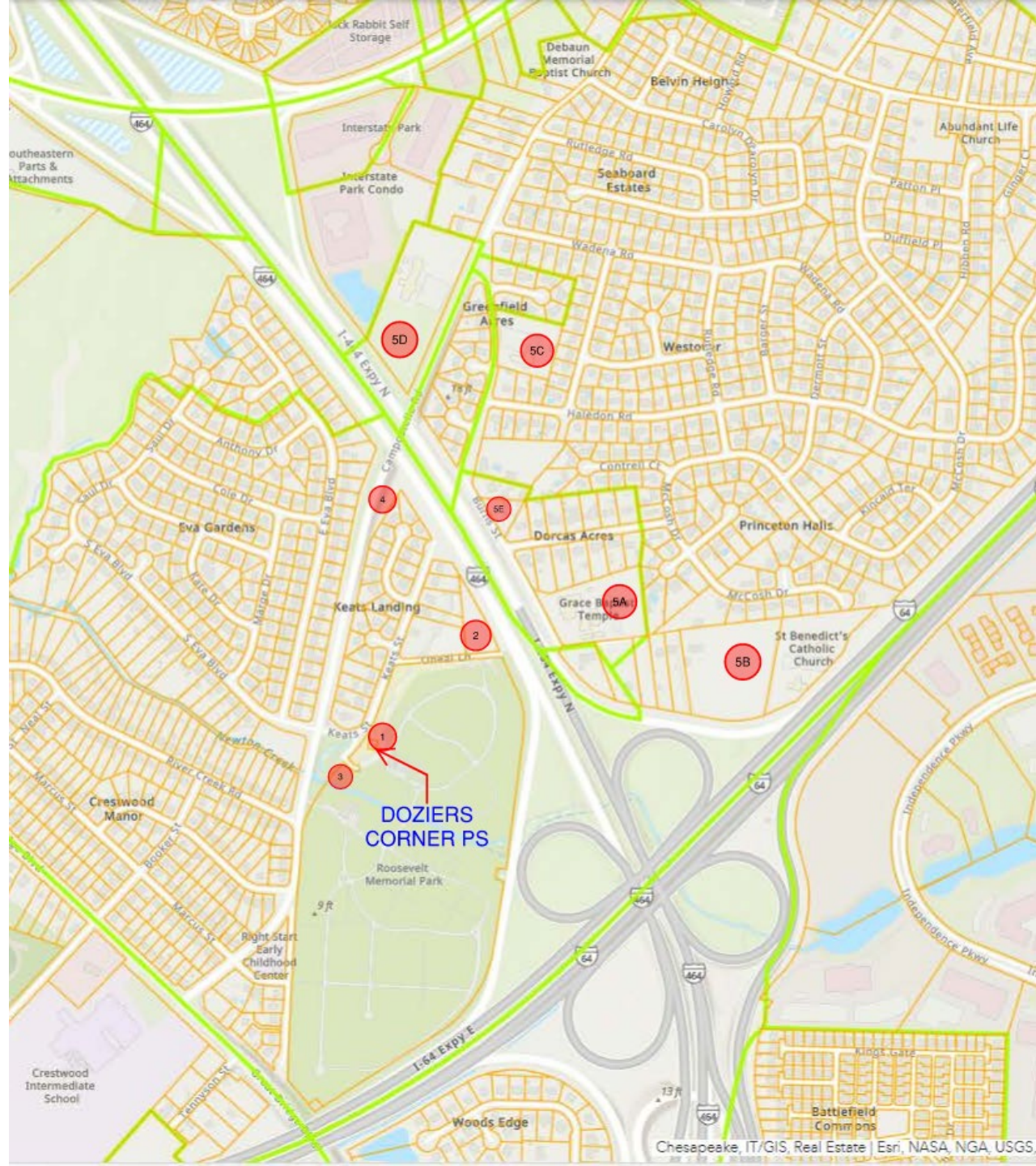
8: VDOT ROW





# Selected Alternatives

- 1- Existing Pump Station (1109 Keats St)
  - **1A – Submersible PS - Existing Pump Station (1109 Keats St)**
- 2 - Vacant Lot (500 Oneal Lane)
  - **2A – Submersible PS - Vacant Lot (500 Oneal Lane)**
- 3 – Roosevelt Memorial Park Cemetery (1101 Campostella Rd)
- **4 – ROW of Campostella**
- **5A – Baptist Temple (1101 Burns St)**
- **5B – Catholic Church (1016 Burns St)**
- **5C – Refresh Community Church (1313 Burns St)**
- **5D – Baptist Church (1316 Campostella Rd)**
- **5E – Home on Burns St – 1205 Burns St**

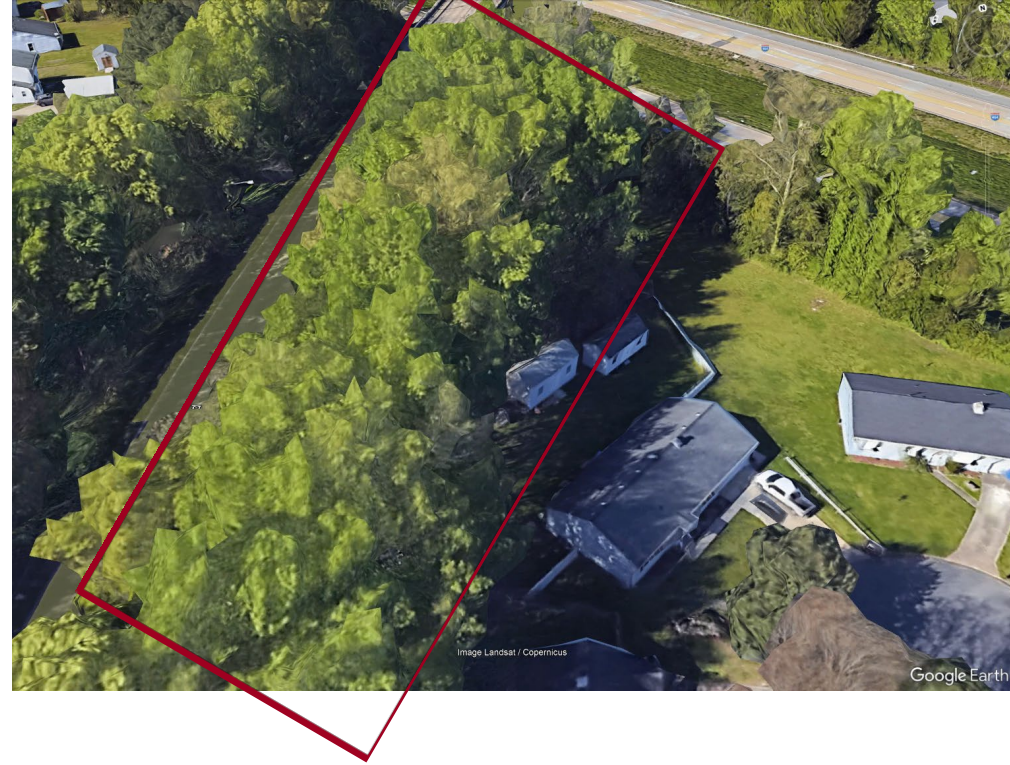




## Alternative 4: ROW of Campostella

---

- Owner's Name:  
N/A, Potentially City of Chesapeake ROW
- Property Address (Primary):  
N/A
- Mailing Address:  
N/A
- Zoning: R8S- Residential
- Parcel Number: 5555555555555
- Total Assessment: N/A
- Acreage: 9.013 (entire parcel). 0.81 ac
- Dimensions: 355' x 100'
- Elevation: 9'





# National Flood Hazard Layer FIRMMette



76°16'42"W 36°46'22"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 76°16'42"W 36°45'53"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



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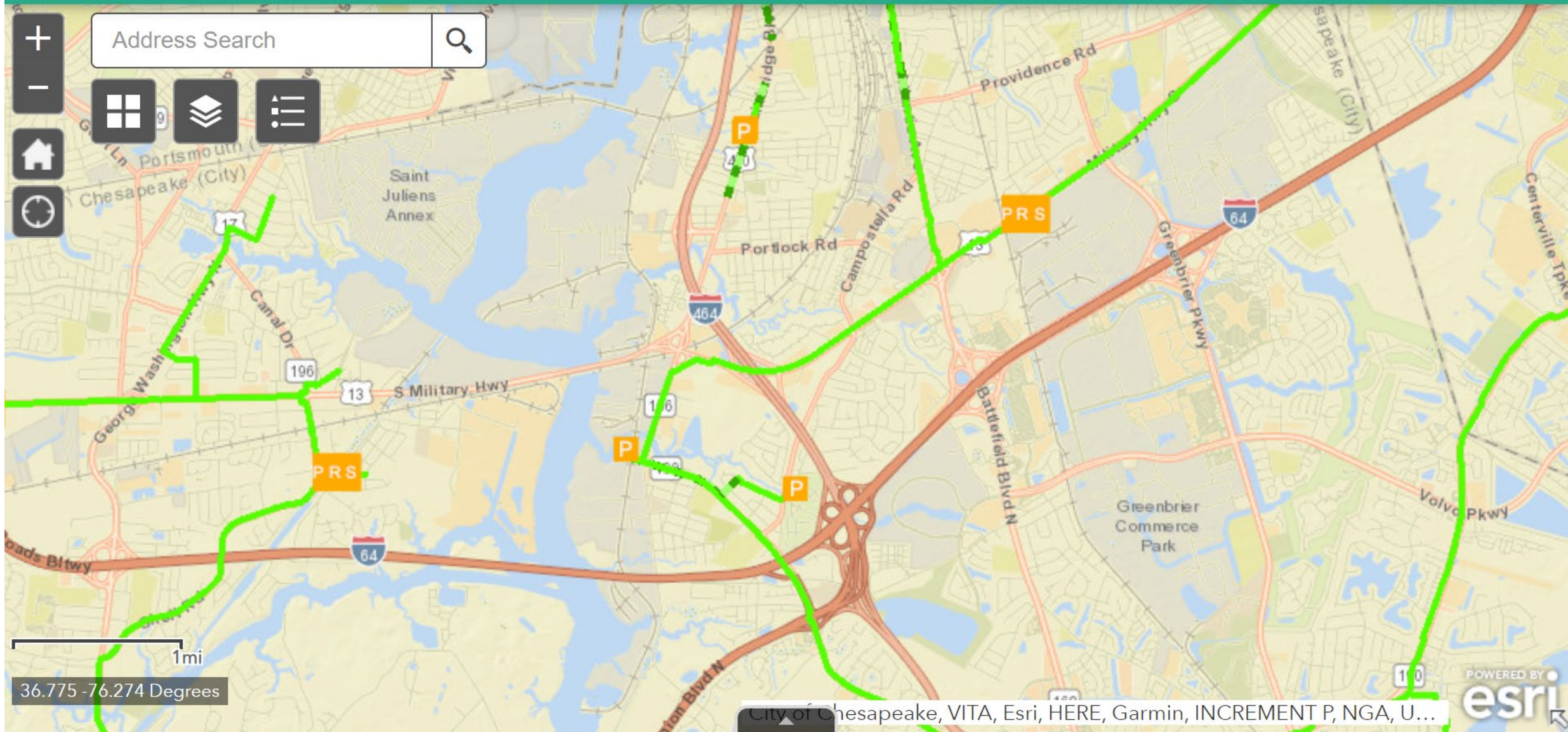


# HRSD Public Map

Hampton Roads Sanitation District



Address Search



1mi  
36.775 -76.274 Degrees

City of Chesapeake, VITA, Esri, HERE, Garmin, INCREMENT P, NGA, U...





# Alternative 5A: Baptist Temple

- Owner's Name:  
Grace Baptist Temple
- Property Address (Primary):  
1101 Burns St Chesapeake, 23320
- Mailing Address:  
1101 Burns St Chesapeake, 23320
- Zoning:  
R15: Residential
- Parcel Number:  
0270000000301
- Total Assessment:  
\$5,763,000
- Acreage: 4.89
- Dimensions 379' x 152':
- Elevation: 12'

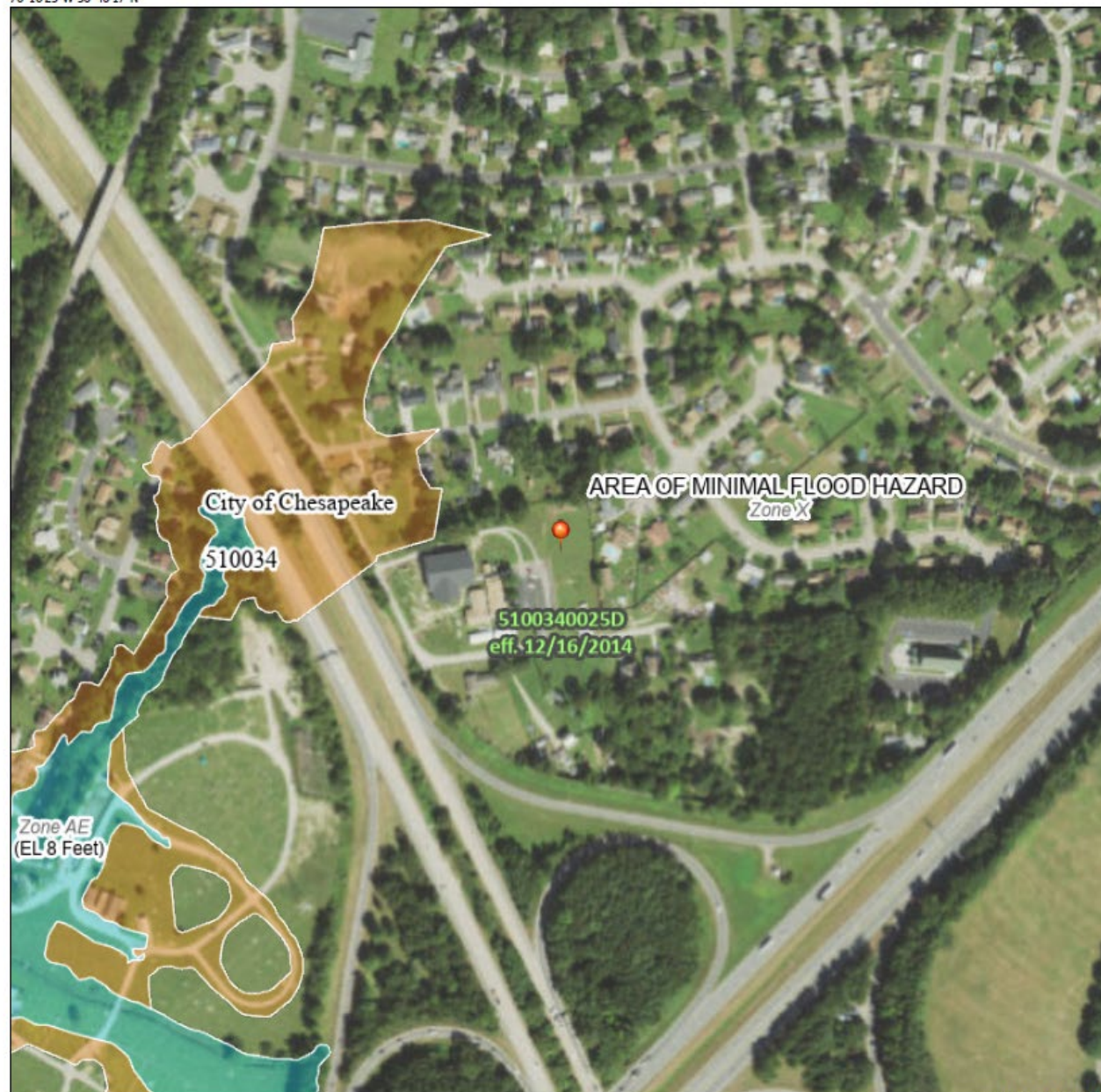




# National Flood Hazard Layer FIRMMette



76°16'25"W 36°46'17"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

76°15'48"W 36°45'48"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes, Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



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## Alternative 5B: Catholic Church

- Owner's Name:  
Knestout Barry C Bishop of Catholic Diocese of Richmond VA
- Property Address (Primary):  
1016 Burns St Chesapeake, 23320
- Mailing Address:  
521 McCosh Dr Chesapeake, 23320
- Zoning: R8S: Residential
- Parcel Number: 0270000000320
- Total Assessment:  
\$473,200
- Acreage: 5.893
- Dimensions: 555' x 364'
- Elevation: 15'





# National Flood Hazard Layer FIRMette



76°16'16"W 36°46'13"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 76°15'39"W 36°45'44"N Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped

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# Alternative 5C: Refresh Community Church

- Owner's Name:  
Higher Life Ministries Inc
- Property Address (Primary):  
1313 Burns St Chesapeake, 23320
- Mailing Address:  
1313 Burns St Chesapeake, 23320
- Zoning: R8S: Residential
- Parcel Number: 0271004000021
- Total Assessment:  
\$696,400
- Acreage: 2.408
- Dimensions: 100' x 365'
- Elevation: 8'

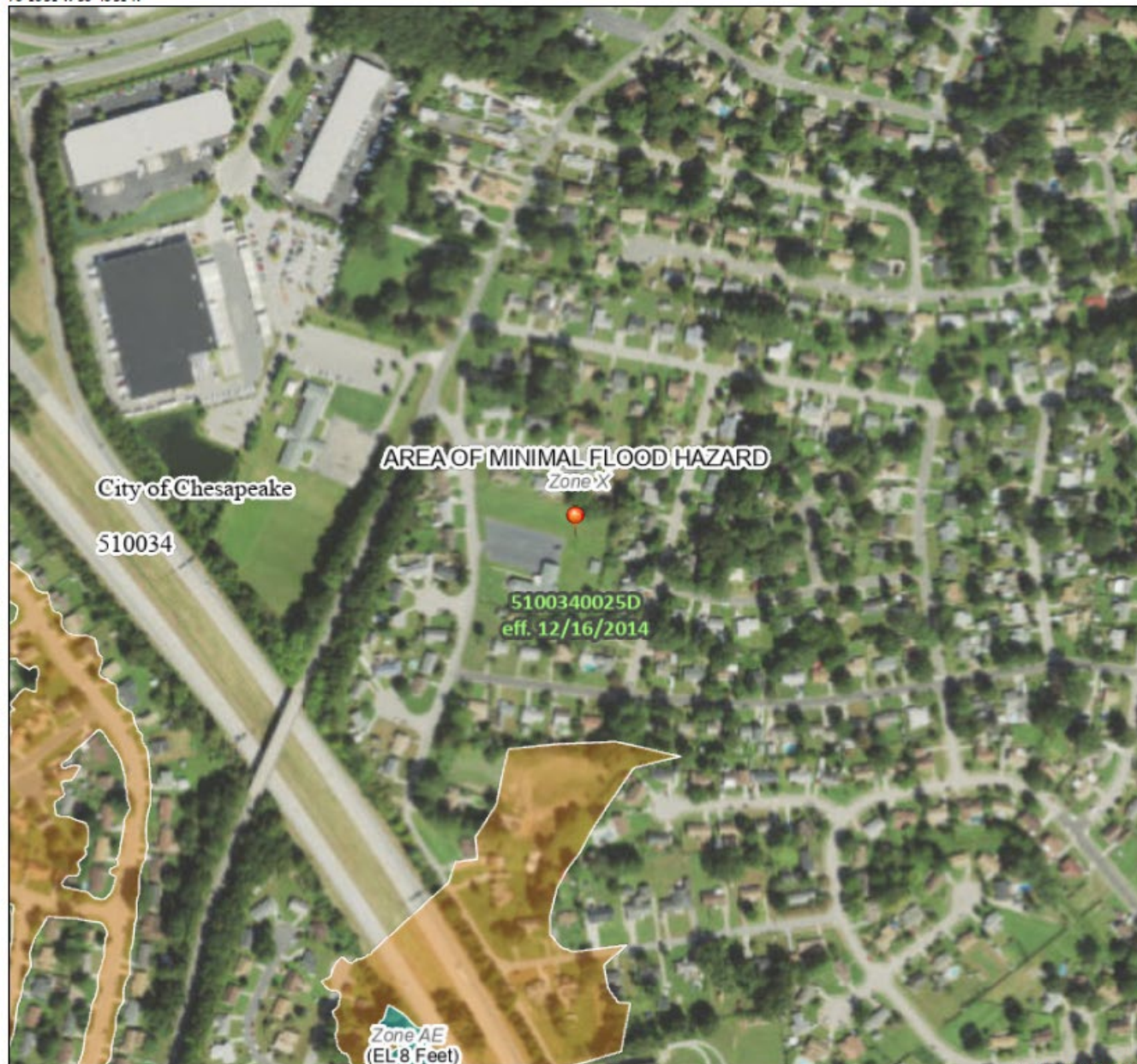




# National Flood Hazard Layer FIRMMette



76°16'31"W 36°46'31"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 76°15'54"W 36°46'2"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard. Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
MAP PANELS		Coastal Transect
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
OTHER FEATURES		Hydrographic Feature
		Digital Data Available
MAP PANELS		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/20/2023 at 2:30 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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# Alternative 5D: Baptist Church

---

- Owner's Name:  
Tidewater Baptist Church Trustees
- Property Address (Primary):  
1316 Campostella Chesapeake, 23320
- Mailing Address:  
1316 Campostella Rd Chesapeake, 23320
- Zoning: O-I: Office and Institutional
- Parcel Number: 0270000000021
- Total Assessment:  
\$1,310,000
- Acreage: 6.108
- Dimensions: 350' x 332'
- Elevation: 9'

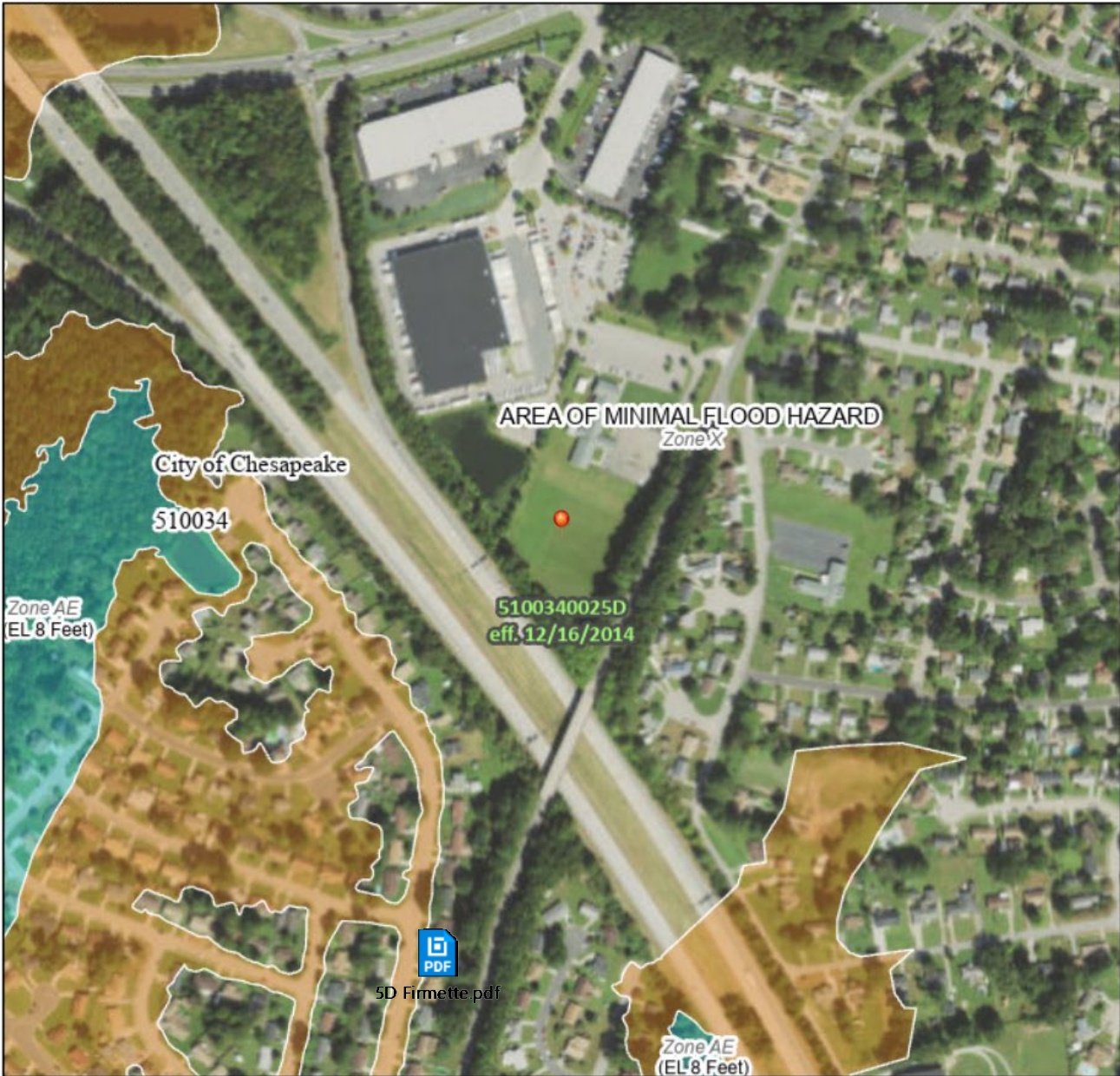




# National Flood Hazard Layer FIRMette



76°16'41"W 36°46'31"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 76°16'41"W 36°46'31"N Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 17.5	Cross Sections with 1% Annual Chance Water Surface Elevation
			Coastal Transect
			Base Flood Elevation Line (BFE)
			Limit of Study
			Jurisdiction Boundary
			Coastal Transect Baseline
			Profile Baseline
			Hydrographic Feature
			Digital Data Available
			No Digital Data Available

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/20/2023 at 2:21 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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## Alternative 5E: Home on Burns St

---

- Owner's Name:  
Taylor Antoinette
- Property Address (Primary):  
1205 Burns St Chesapeake, 23320
- Mailing Address:  
1205 Burns St Chesapeake, 23320
- Zoning:  
R-15: Residential
- Parcel Number: 0271007000002
- Total Assessment:  
\$217,000
- Acreage: 0.45
- Dimensions: 95' x 90'
- Elevation: 11'

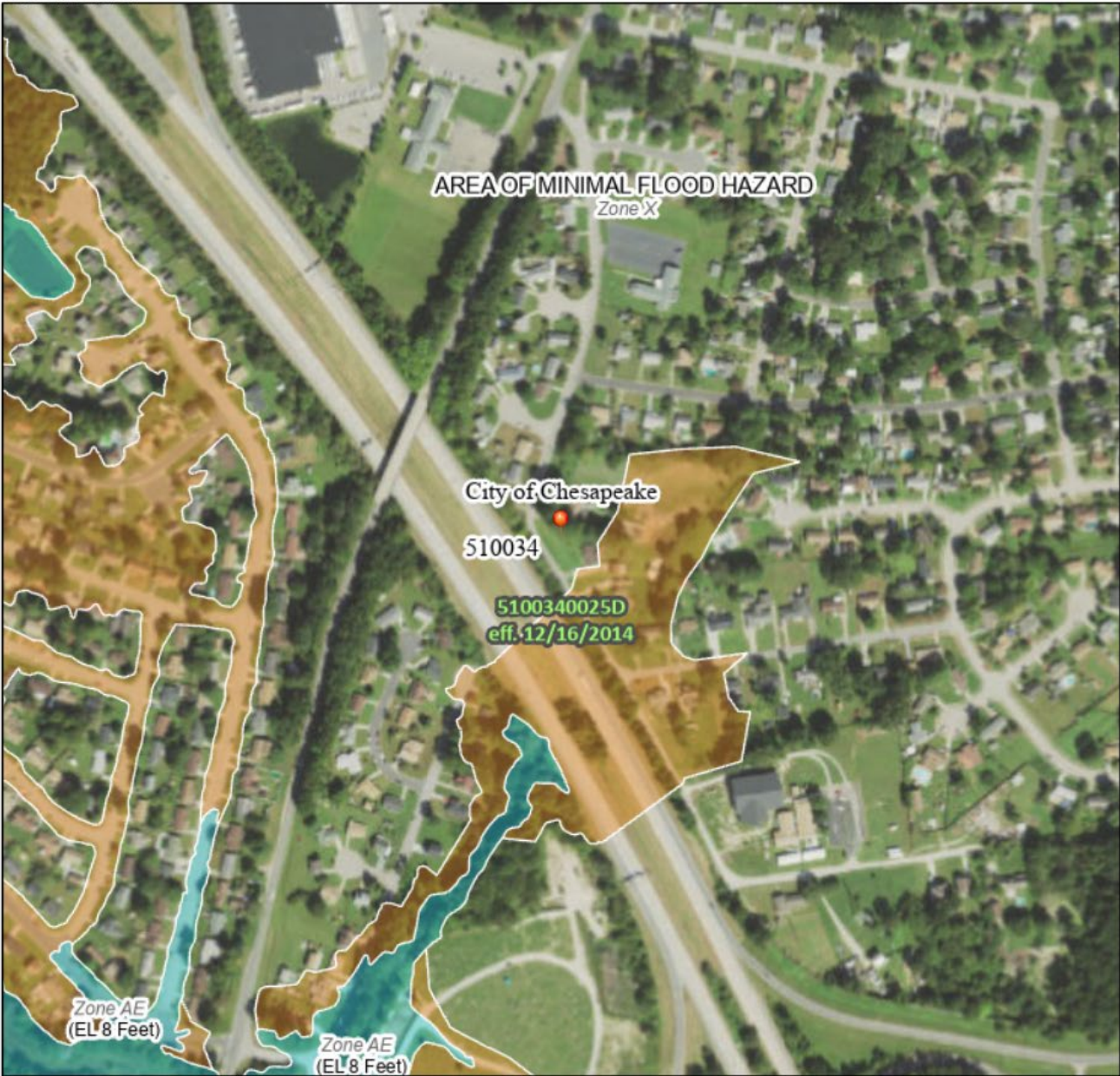




# National Flood Hazard Layer FIRMette



76°16'36"W 36°46'23"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 76°15'58"W 36°45'54"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee, See Notes, Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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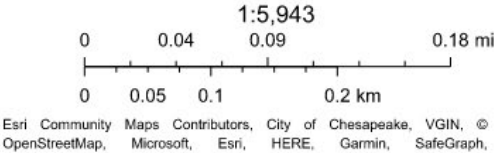
HRSD GES Dozier Corner Pump Station Replacement

Site Elevation

LEGEND (FT)



10/20/2023



# Depth Calculations

Alternative	Total LF	Elevation Drop	Grade Elevation at Alternative	Minimum Required Depth	Notes:
OLD Alt. 4 - Great Bridge Blvd & Campostella	2000	3.00	10	<b>16.54</b>	Eliminated after Alt. Exploration Mtg.
Alt. 2 - Oneal (Cemetery Laydown)	1060	1.59	12	<b>17.13</b>	Over 16' sewer depth.
Alt. 3 - Roosevelt	65	0.10	7	<b>10.64</b>	
Alt. 4 - Campostella ROW	1775	2.66	9	<b>15.20</b>	Estimated elevation, difficult to discern
Alt. 5A - Baptist Temple	1865	4.10	12	<b>13.93</b>	Using Manhole Invert of 2.17 per as-built
Alt. 5B - Catholic Church	2335	5.14	15	<b>17.97</b>	Using Manhole Invert of 2.17 per as-built
Alt. 5C - Refresh Community Church	1225	2.70	8	<b>8.53</b>	Using Manhole Invert of 2.17 per as-built
Alt. 5D - Baptist Church	2080	4.58	9	<b>11.41</b>	Using Manhole Invert of 2.17 per as-built
Alt. 5E - Home on Burns Street	120	0.26	11	<b>9.09</b>	Using Manhole Invert of 2.17 per as-built

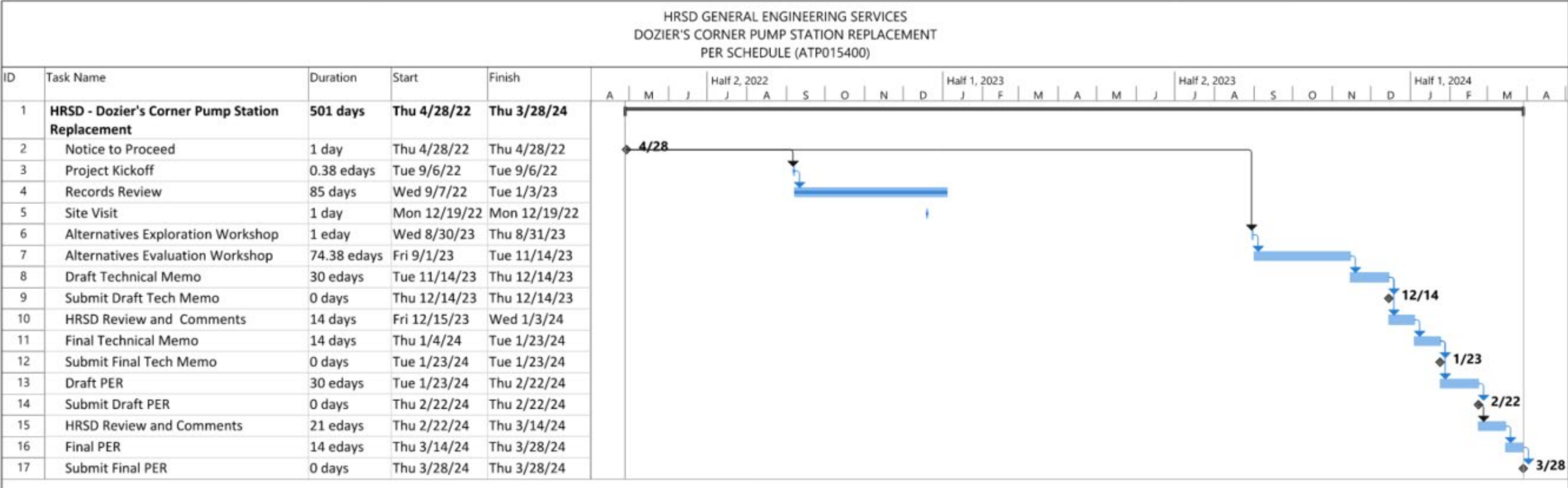
- 12 inch: Min Slope in Feet per 100 Feet – 0.22
- 15 inch: Min Slope in Feet per 100 Feet – 0.15

# Alternatives Evaluation Matrix Review

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# Schedule





ADDITIONAL COMMENTS OR QUESTIONS?

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# Alternative 1 (and 1A): Existing PS Site

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- Owner's Name:

HRSD

- Property Address (Primary):

1109 Keats St Chesapeake, VA 23320

- Mailing Address:

1436 Air Rail Ave Virginia Beach, VA 23455-3002

- Zoning: R8S- Residential
- Parcel Number: 0360000002891
- Total Assessment:\$185,900.00
- Acreage: 0.037
- Dimensions: 49' x 49'
- Elevation: 6'

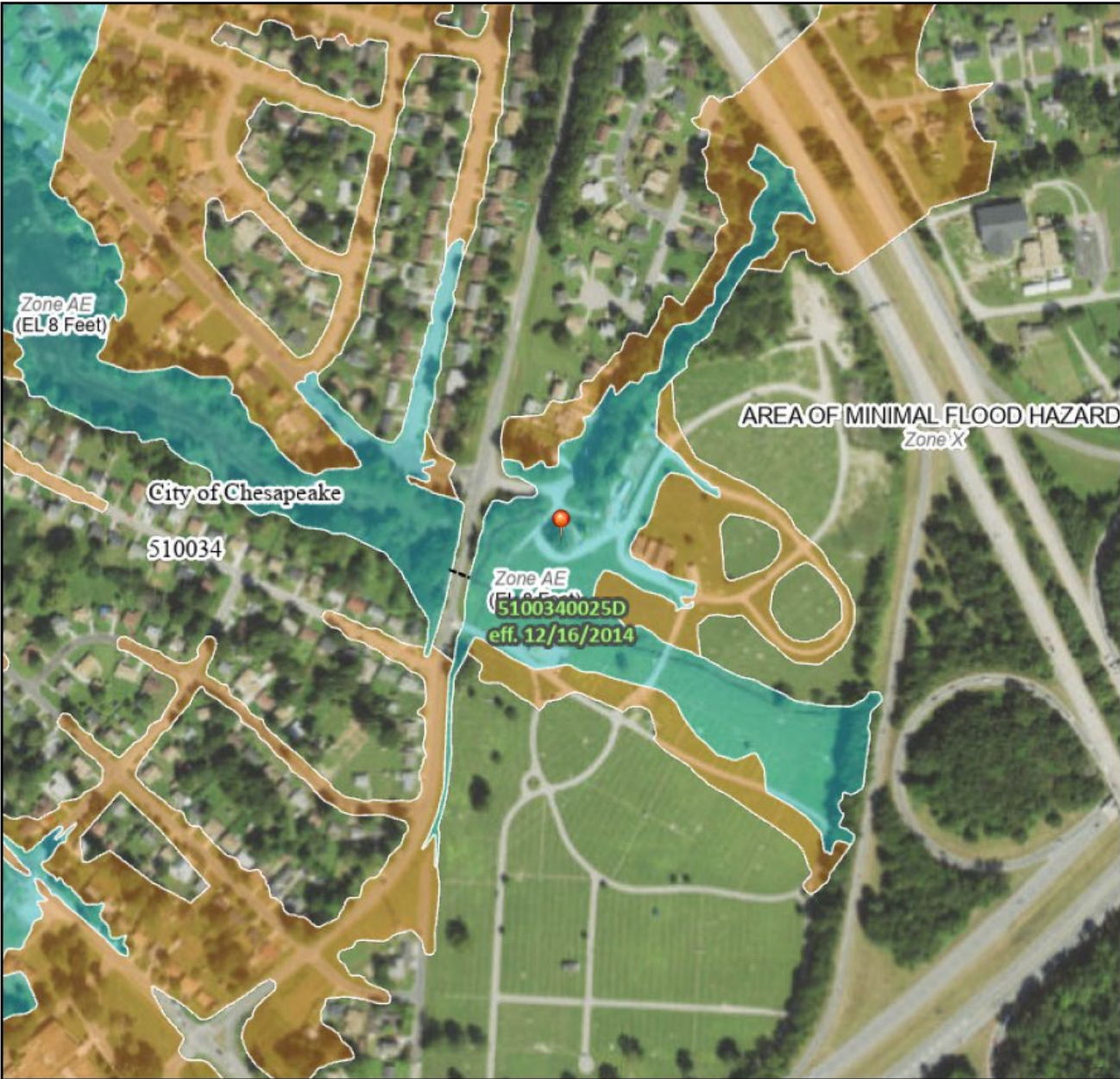




# National Flood Hazard Layer FIRMMette



76°16'44"W 36°46'8"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000  
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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## Alternative 2 (and 2A): Vacant Lot / 500 Oneal Ln

---

- Owner's Name:  
Cemetery Investments Inc
- Property Address (Primary):  
500 Oneal Lane Chesapeake, VA 23320
- Mailing Address:  
5714 Roosevelt Memorial Park 3600 Horizon  
Blvd STE 100 Trevose, PA 19053-4965
- Zoning: R8S- Residential
- Parcel Number: 02700000000300
- Total Assessment:  
\$42,400.00
- Acreage: 1.29
- Dimensions: 175' x 445'
- Elevation: 12'





# National Flood Hazard Layer FIRMMette



76°16'35"W 36°46'14"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000  
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual chance Water Surface Elevation
MAP PANELS		Digital Data Available
		No Digital Data Available
MAP PANELS		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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# Alternative 3: Roosevelt Memorial Park Cemetery

---

- Owner's Name:  
Cemetery Investments Inc
- Property Address (Primary):  
1101 Campostella Road
- Mailing Address:  
Stonemor Operating LLC 3600 Horizon Blvd  
#100 FSTRVL TRVOSE, PA 19053-4965
- Zoning: R8S- Residential
- Parcel Number: 0360000003510
- Total Assessment: \$1,535,600.00
- Acreage: 50.416
- Dimensions: 150' x 150'
- Elevation: 7'

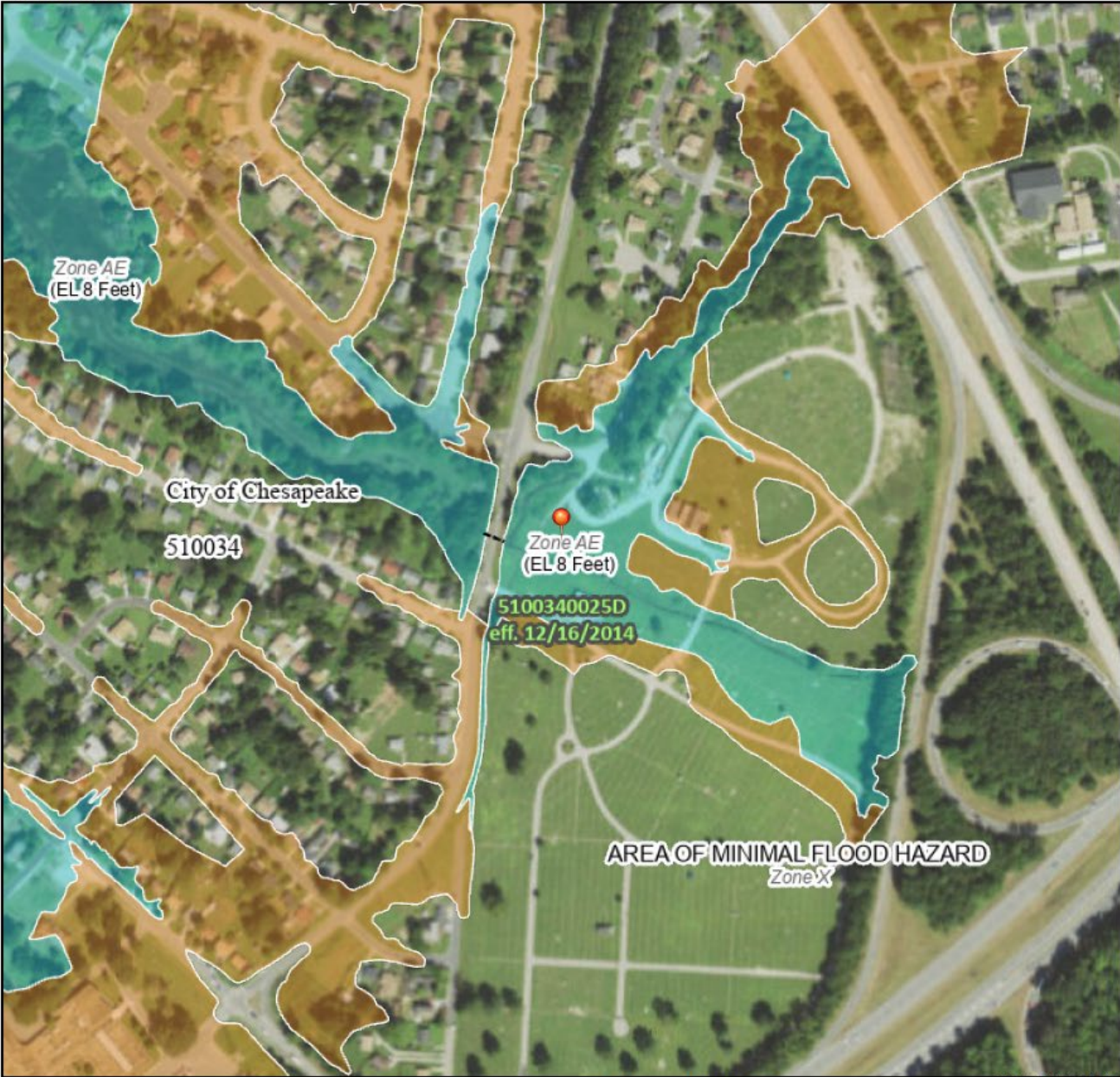




# National Flood Hazard Layer FIRMette



76°16'45"W 36°46'7"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000  
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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CID519999\_HRSD\_CFPF-2\_MaintenancePlan

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

#### Supporting Documentation – Maintenance Plan

The HRSD Maintenance Plan for the Dozier's Corner Pump Station Replacement is in a separate attachment, CID519999\_HRSD\_CFPF-2\_MMMPlan, which is uploaded to the application sections Scope of Work Supporting Information – Projects, and in the Supporting Documentation under "Maintenance and management plan for the project."

If needed, the full HRSD maintenance plan (a very large document) is available and can be provided.

October 23, 2024

Virginia Department of Conservation and Recreation  
600 East Main Street, 24th Floor  
Richmond, Virginia 23219-2094

**Re: Dozier's Corner Pump Station - Letter of Support**

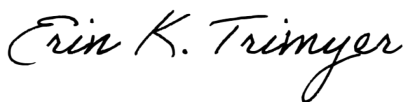
Dear Sir/Madame:

The City of Chesapeake fully supports HRSD's projects to replace the Dozier's Corner Pump Station in the Great Bridge neighborhood of Chesapeake. This area is low-lying and the risk of widespread flooding is prevalent. Providing reliable sanitary sewer service is critical to protecting public health and the waterways that define the landscape of our region and contribute heavily to the local economy and quality of life.

This HRSD pump station works in combination with City infrastructure to provide reliable sewage collection and conveyance to over 600 acres of residential, commercial, and industrial properties. This pump station must be operational all-day, every day to avoid sanitary sewer overflows. The project represents a substantial investment in the community by proactively addressing flood risk to this pump station as well as aging infrastructure concerns. In addition to a resilient wastewater pump station, the project will also minimize localized flooding by addressing a known, nearby stormwater culvert deficiency.

Chesapeake has been an active participant in the design development of this pump station and understands the challenges associated with creating viable engineered solutions within a fully developed community where people live, work, and recreate. The solution developed for this project represents a thorough investigation of alternatives considering the positives and negatives of financial, social, and environmental aspects.

Sincerely,



Erin K. Trimyer, P.E.  
Deputy Director

CID519999\_HRSD\_CFPF-2\_ResiliencePlan

Applicant: Hampton Roads Sanitation District

Project Name: Dozier's Corner Pump Station Replacement

#### Other Attachments – Resilience Plan

Hampton Roads Sanitation District's Resilience Plan was approved by Virginia Department of Conservation and Recreation.

Attached is the approval letter dated August 30, 2024, from Angela Davis, Director, Division of Floodplain Management.



**COMMONWEALTH of VIRGINIA**  
DEPARTMENT OF CONSERVATION AND RECREATION

August 30, 2024

Ryan Radspinner, PE  
Business Process Engineer  
Hampton Roads Sanitation District  
PO Box 5915  
Virginia Beach, VA 23471-0915

RE: HRSD Resiliency Plan Submission – CFPF

Dear Mr. Radspinner,

Thank you for submitting the *Hampton Roads Sanitation District (HRSD) Resiliency Plan*. After careful review and consideration, the Virginia Department of Conservation and Recreation has deemed the Plan complete, meeting all applicable criteria outlined in the Community Flood Preparedness Fund Round 4 Grant Manual. This approval will remain in effect for a period of five years, ending on August 30, 2029.

As a political subdivision of the Commonwealth created by an Act of Assembly (1940), HRSD is considered a local government for the purposes of the Community Flood Preparedness Fund (§ 10.1-603.24). Hampton Roads Sanitation District is the owner and operator of critical infrastructure that collects, conveys and treats wastewater generated by almost two million people in twenty localities across Eastern Virginia. As the sole provider of these services, HRSD is a “community lifeline,” providing a most fundamental service that enables all other aspects of society to function.

The following elements were evaluated as part of this review:

**Element 1: It is project-based with projects focused on flood control and resilience.**

The *HRSD Resiliency Plan* draws flood control and resilience project possibilities primarily from the *Capital Improvement Plan*, informed by the document *Climate Change Planning Study: Utility-wide Flood Risk Results and Initial Mitigation Implementation Schedule*.

**Element 2: It incorporates nature-based infrastructure to the maximum extent possible.**

The *HRSD Resiliency Plan Executive Summary* aptly explains that while some proposed projects may be hybrid in nature, wastewater treatment on the community lifeline scale does not always lend itself to nature-based solutions. *Mitigation Concepts Summary Technical Memorandum* outlines that typical methods for this type of infrastructure would be dry-floodproofing, floodwalls with gates, and in some cases earthen levees, elevation or relocation.



HRSD's internal mitigation project ranking uses the "triple bottom line" scoring method described by the Envision framework of the Institute for Sustainable Infrastructure, which measures social and environmental benefits alongside economic prudence.

HRSD's commitment to nature-based stewardship is expressed through incorporation of sustainability measures where applicable, including managed meadows, solar roofs, rainwater cisterns. Particularly notable is the Sustainable Water Initiative for Tomorrow (SWIFT) program which puts treated water through additional rounds of advanced treatment to meet drinking water standards and injects it into the Potomac Aquifer to replenish groundwater resources and slow land subsidence. Eventually 90% of HRSD's discharge to local waters will be eliminated, reducing nutrient loads flowing to Chesapeake Bay.

**Element 3: It considers of all parts of a locality regardless of socioeconomics or race.**

The *HRSD Resiliency Plan* includes projects in a wide range of socioeconomic contexts and a spectrum of rural, suburban to urban conditions, as one would expect from their diverse, wide ranging service area. A map of EPA Environmental Justice index values across the service area also shows that treatment plants are not concentrated in low-income communities or communities of color.

Understanding the economic realities of their service base, HRSD strives to keep rates down through aggressive management of flood risk, as repair costs would be spread across all customers. As written in the Plan: "It is HRSD's responsibility to our customers to plan, design, construct, maintain, and operate our infrastructure to provide resilient service regardless of the socioeconomics of individual communities." This is critical as there is no other provider of this service in Eastern Virginia.

**Element 4: Identifies all flooding occurring within locality, not only within SFHAs, and provides repetitive / severe repetitive loss data.**

Firmettes are included for all proposed project locations as well as a contextual map of HRSD assets in relation to the greater SFHA.

**Element 5: If property acquisition and / or relocation guidelines are included, equitable relocation strategies are addressed.**

Not applicable.

**Element 6: Includes a strategy for debris management.**

The *HRSD Resiliency Plan* includes by reference the *2024 HRSD Hurricane Readiness and Recovery Plan*. This includes a specific list of debris clearance priorities and coordination points with other essential utilities to restore service and prevent environmental consequences to Tidewater and the Eastern Shore. An annual schedule for testing and maintenance of extensive fleet of debris removal equipment and training for all employees on protocols outlined in the *Damage Assessment Plan*.

**Element 7: Includes administrative procedures for substantial damage / substantial improvement of structures within the SFHA.**

HRSD is subject to the floodplain ordinance and substantial damage administrative procedures of the locality where each of its buildings are located.

**Element 8: It includes coordination with other local and inter-jurisdictional projects, plans, and activities and has a clearly articulated timeline or phasing for plan implementation.**

The *HRSD Resiliency Plan* describes how HRSD coordinates with the needs of the localities it serves and takes part in the hazard mitigation planning for the Hampton Roads area, specifically as an active participant in the *HRPDC Hazard Mitigation Plan*.

In the process of implementing its own flood risk mitigation projects as outlined in *Climate Change Planning Study: Utility-wide Flood Risk Results and Initial Mitigation Implementation Schedule*, HRSD expects that working with local governments on regional solutions will often amplify their mitigation efforts. This type of coordination would be considered on an annual basis as science progresses and re-assessments of vulnerability are made.

**Element 9: Is based on the best available science, and incorporates climate change, sea level rise, storm surge (where appropriate), and current flood maps.**

The *HRSD Resiliency Plan* includes by reference *Flood Risk in a Changing Climate* which examines the impacts of climate change on their facilities over the next 80 years using technical assessments produced by the *Climate Change Planning Study: Flood Water Level Evaluations for Treatment, Pumping and Administration Facilities*.

HRSD and their consultants performed extensive original H&H analyses, considering the degree to which flooding from all sources impacts their facilities. A range of storm scenarios and planning horizons inform resilience needs and strategy. Additional sources include FEMA maps and studies, USACE, NOAA, DCR and other state or federal research programs.

DCR looks forward to working with HRSD to build a more resilient Commonwealth. If you have questions or need additional assistance, please contact us at [cfpf@dcr.virginia.gov](mailto:cfpf@dcr.virginia.gov). Again, thank you for your interest in the Community Flood Preparedness Fund and your participation in this program.

Sincerely,

A handwritten signature in grey ink, appearing to read 'Angela Davis', with a horizontal line extending to the right.

Angela Davis, Director  
Division of Floodplain Management

cc: Darryl M. Glover, DCR