

**Environmental Assessment
Village of Patchogue Out-of-District Sewer Extension
Patchogue, Suffolk County, New York**

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TABLE OF CONTENTS

1.0	Introduction.....	1
1.1	Suffolk County Coastal Resiliency Initiative	1
1.2	Village of Patchogue Out-of-District Sewer Extension Project Environmental Review Process.....	2
2.0	Purpose and Need	2
3.0	Project Location and Background	3
4.0	Alternatives.....	4
4.1	Alternative 1: No Action	4
4.2	Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension.....	4
4.3	Alternative 3: Vacuum Sewer Extension	6
4.4	Alternatives Considered and Dismissed.....	8
	4.4.1 Gravity Sewer Extension.....	8
	4.4.2 Central Pump Stations.....	8
4.5	Summary Evaluation of Alternatives	9
5.0	Affected Environment and Potential Impacts.....	9
5.1	Geology, Soils, and Topography.....	10
	5.1.1 Existing Conditions	10
	5.1.2 Potential Impacts and Proposed Mitigation.....	11
5.2	Air Quality.....	13
	5.2.1 Existing Conditions	14
	5.2.2 Potential Impacts and Proposed Mitigation.....	14
5.3	Water Resources.....	15
	5.3.1 Existing Conditions	15
	5.3.1.1 Water Quality	15
	5.3.1.2 Wetlands.....	18
	5.3.1.3 Floodplains	19
	5.3.1.4 Coastal Resources.....	19
	5.3.2 Potential Impacts and Proposed Mitigation.....	20
5.4	Vegetation	24
	5.4.1 Existing Conditions	24
	5.4.2 Potential Impacts and Proposed Mitigation.....	24
5.5	Wildlife and Fish.....	25
	5.5.1 Existing Conditions	25
	5.5.2 Potential Impacts and Proposed Mitigation.....	26
5.6	Threatened and Endangered Species and Critical Habitat	28
	5.6.1 Existing Conditions	28
	5.6.2 Potential Impacts and Proposed Mitigation.....	29

5.7	Cultural Resources	29
5.7.1	Existing Conditions	30
5.7.2	Potential Impacts and Proposed Mitigation.....	32
5.8	Land Use and Planning.....	34
5.8.1	Existing Conditions	34
5.8.2	Potential Impacts and Proposed Mitigation.....	34
5.9	Environmental Justice	35
5.9.1	Existing Conditions	36
5.9.2	Potential Impacts and Proposed Mitigation.....	38
5.10	Noise.....	38
5.10.1	Existing Conditions	39
5.10.2	Potential Impacts and Proposed Mitigation.....	39
5.11	Transportation	40
5.11.1	Existing Conditions	40
5.11.2	Potential Impacts and Proposed Mitigation.....	41
5.12	Public Services and Utilities.....	42
5.12.1	Existing Conditions	42
5.12.2	Potential Impacts and Proposed Mitigation.....	42
5.13	Public Health and Safety	44
5.13.1	Existing Conditions	44
5.13.2	Potential Impacts and Proposed Mitigation.....	44
5.14	Hazardous Materials.....	45
5.14.1	Existing Conditions	45
5.14.2	Potential Impacts and Proposed Mitigation.....	46
5.15	Climate Change	47
5.15.1	Existing Conditions	47
5.15.2	Potential Impacts and Proposed Mitigation.....	48
5.16	Cumulative Impacts.....	49
5.16.1	Projects Considered for Analysis of Cumulative Impacts.....	50
5.16.2	Cumulative Impacts.....	50
5.17	Irreversible and Irretrievable Impacts	52
6.0	Permits and Project Conditions.....	52
6.1	Permits, Reviews and Approvals.....	52
6.2	Project Conditions	53
7.0	Agency Coordination and Public Involvement	56
8.0	Conclusion	57

9.0 List of Preparers 57
10.0 Summary of Impacts..... 58
11.0 References 65

LIST OF TABLES

Table 1. Evaluation Criteria for Potential Impacts 9
Table 2. Soil Types within the Study Area 11
Table 3. Existing Backup Generator Emissions 14
Table 4. Physical Characteristics for the Upper Glacial, Magothy, and Lloyd Aquifers 17
Table 5. Project Area Demographic Profile..... 37
Table 6. Anticipated Permits, Reviews, and Approvals 52
Table 7. Summary of Impacts 58

LIST OF APPENDICES

Appendix A: Figures

- Figure 1. Suffolk County Coastal Resiliency Initiative Project Locations
- Figure 2. Project Area
- Figure 3. Soils Map
- Figure 4. Depth to Groundwater
- Figure 5. NWI Wetlands
- Figure 6. NYSDEC Wetlands
- Figure 7. FIRM Panel 36103C0694H
- Figure 8. FIRM Panel 36103C0907H
- Figure 9. Coastal Zone
- Figure 10. Coastal Barrier Resources
- Figure 11. Existing Land Use
- Figure 12. Environmental Justice Areas
- Figure 13. Remediation Sites
- Figure 14. Zoning Map
- Figure 15. Airport Hazards

Appendix B: State Environmental Quality Review Act Documentation

Appendix C: Coastal Zone Management

Appendix D: Ambient Air Quality Standards

Appendix E: Sole Source Aquifer Screening

Appendix F: 8-Step Floodplain Review Process

Appendix G: Phase IA Cultural Resources Survey

Appendix H: Federally Listed Threatened and Endangered Species Known or Likely to Occur in the Project Area

Appendix I: Correspondence

LIST OF ACRONYMS

APE – Area of potential effects

AWTF – Advanced wastewater treatment facility

BMPs – Best management practices

CEHA – Coastal erosion hazard area

CEQ – Council on Environmental Quality

CFR – Code of Federal Regulations

CRNMP – Coastal Resiliency and Nitrogen Mitigation Plan

CWA – Clean Water Act

CWRM – Comprehensive Water Resources Management

CZMP – Coastal Zone Management Plan

dB – decibels

dba – A-weighted decibels

DHSES – Department of Homeland Security and Emergency Services

EA – Environmental assessment

EFH – Essential fish habitat

EJ – Environmental justice

EO – Executive Order

EPA – U.S. Environmental Protection Agency

ERR – Environmental Review Record

FEMA – Department of Homeland Security-Federal Emergency Management Agency

FIRM – Flood Insurance Rate Map

FONSI – Finding of No Significant Impact

GOSR – Governor’s Office of Storm Recovery

GPD – Gallons per day

HDPE – High-density Polyethylene Piping

HMGP – Hazard Mitigation Grant Program

HUD – U.S. Department of Housing and Urban Development

Initiative – Suffolk County Coastal Resiliency Initiative

kW – Kilowatt

Ldn – Day Night Noise Level

Leq – Equivalent noise level

LIRR – Long Island Railroad

LPSGPS – Low-pressure sewer grinder pump stations
LWRP – Local Waterfront Revitalization Program
MGD – Million gallons per day
mg/L – Milligrams per liter
NAAQS – National Ambient Air Quality Standards
NAVD88 – North American Vertical Datum of 1988
NEPA – National Environmental Policy Act
NHP – Natural Heritage Program
NHPA – National Historic Preservation Act
NRHP – National Register of Historic Places
NYS – New York State
NYSDEC – New York State Department of Environmental Conservation
NYCRR – New York Codes, Rules and Regulations
OPRHP – Office of Parks, Recreation and Historic Preservation
OSHA – Occupational Safety and Health Administration
OSWS – On-site wastewater treatment and disposal systems
PM₁₀ – Particulate matter less than 10 micrometers in diameter
PM_{2.5} – Particulate matter less than 2.5 micrometers in diameter
ROW – Right-of-way
SEQRA – State Environmental Quality Review Act
SHPO – New York State Historic Preservation Office
SIP – State Implementation Plan
SPDES – State Pollutant Discharge Elimination System
SPL – Sound pressure level
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total maximum daily load
USACE – U.S. Army Corps of Engineers
USC – United States Code
USFWS – U.S. Fish and Wildlife Service

1.0 INTRODUCTION

On October 29, 2012, Hurricane Sandy caused storm damage to several areas across the state of New York. On October 30, 2012, President Barack Obama declared Hurricane Sandy a major disaster. The declaration authorized the Department of Homeland Security-Federal Emergency Management Agency (FEMA) to provide assistance to the state per federal disaster declaration DR-4085-NY and in accordance with Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1974 (42 United States Code [USC] 5170c), as amended; the Sandy Recovery Improvement Act of 2013; and the accompanying Disaster Relief Appropriations Act of 2013. Suffolk County (subrecipient) has applied to the FEMA Hazard Mitigation Grant Program (HMGP) for funding of the Suffolk County Coastal Resiliency Initiative (the Initiative). The New York State (NYS) Division of Homeland Security and Emergency Services (DHSES) is the recipient partner.

1.1 Suffolk County Coastal Resiliency Initiative

The Initiative seeks to mitigate impacts on human life and property, surface waters, and coastal wetlands associated with on-site wastewater treatment and disposal systems (OSWS) failures caused by natural hazards. These natural hazards include rain events, storm surge, and coastal flooding, particularly as they contribute to rising groundwater elevations and septic or cesspool failures for the 74 percent of homes in Suffolk County that rely on OSWS (Suffolk County 2015a).

Suffolk County worked together with local community representatives on the Suffolk County Sewer District/Wastewater Treatment Task Force (Task Force) to delineate areas where investment in sanitary sewer and wastewater infrastructure could provide environmental, economic, and/or social benefits and identify critical need areas where the implementation of sewerage infrastructure may be warranted and should be assessed. The Task Force and 2015 [*Suffolk County Comprehensive Water Resources Management Plan*](#) identified the connection of parcels in SSD #3 and the Carlls, Connetquot, Forge, and Patchogue River watersheds as key measures to address several water and environmental quality issues (Appendix A, Figure 1) (Suffolk County 2015a). This process resulted in the identification of several potential projects.

- *SSD #3:* SSD #3 is south and west of the Southern State Parkway from the Nassau County line to the hamlet of East Islip, in the townships of Babylon and Islip. This project would install service laterals connecting 2,232 residential parcels in SSD #3 to existing collection and conveyance systems terminating at Suffolk County's Bergen Point Wastewater Treatment Plant.
- *Carlls River Watershed:* The Carlls River is located in Babylon and flows into the Great South Bay on the mainland side of Long Island just north of the Fire Island Inlet. This project comprises three sub-areas: North Babylon, West Babylon, and Wyandanch, and it would construct a new collection system to connect 2,601 parcels to existing conveyance and treatment systems.
- *Connetquot River Watershed:* The Connetquot River is located on the south shore of Long Island in Great River and flows into the Great South Bay. This project would construct a new collection system to connect 500 parcels to existing conveyance and treatment systems.

- *Patchogue River Watershed:* The Patchogue River is located off of Patchogue Bay on Long Island's south shore, about 17 miles east of the Fire Island Inlet and 14 miles west of the Moriches Bay Inlet. This project would construct a new collection system to connect 648 parcels to existing conveyance and treatment systems.
- *Forge River Watershed:* Forge River, the most eutrophic waterbody in Suffolk County (DHSES 2015), is located within the hamlets of Mastic and Shirley in the Town of Brookhaven. This project would construct new collection and conveyance systems, connecting 2,094 parcels to a new advanced wastewater treatment plant (AWTF). Calabro Airport in the Town of Brookhaven is one potential site under consideration for the location of the AWTF. The Initiative was configured in such a way that the five projects could each advance independently, subject to availability of funding.

1.2 Village of Patchogue Out-of-District Sewer Extension Project Environmental Review Process

This document addresses the proposed Village of Patchogue Out-of-District Sewer Extension Project (the project) in the Patchogue River Watershed. The project is functionally, geographically, hydrologically, and hydraulically separate from the four remaining potential projects discussed above as part of the Initiative and would have both independent utility and a distinct schedule for implementation. Therefore, a permissibly separate environmental review process for this project will be completed with a rigorous assessment of cumulative impacts to ensure that the review will be no less protective of the environment.

FEMA is the lead agency under the National Environmental Policy Act (NEPA) and related laws for the environmental review of the proposed Village of Patchogue Out-of-District Sewer Extension Project (the proposed action). The Governor's Office of Storm Recovery (GOSR) is the lead agency pursuant to the State Environmental Quality Review Act (SEQRA) and related laws for the environmental review of the proposed action.

This environmental assessment (EA) has been prepared in accordance with Section 102 of NEPA, as amended, and the Council on Environmental Quality (CEQ) Regulations for Implementation of NEPA (40 Code of Federal Regulations [CFR] 1500–1508). The purpose of the EA is to analyze the potential environmental impacts of the proposed action and alternatives, including a no-action alternative, and to determine whether to prepare an environmental impact statement or a Finding of No Significant Impact (FONSI). In accordance with above-referenced regulations and FEMA's regulations for NEPA compliance (44 CFR 10), FEMA is required during decision making to fully evaluate and consider the environmental consequences of major federal actions it funds or undertakes.

2.0 PURPOSE AND NEED

Section 404 of the Robert T. Stafford Relief and Emergency Assistance Act of 1974 (42 USC 5170c), as amended, authorizes FEMA to provide funding to eligible grant applicants for activities with the purpose of reducing or eliminating risks to life and property from hazards and their effects. The primary purpose of this project is to mitigate short-term and repetitive, adverse impacts on human life and property associated with OSWS failures. The secondary purpose is to mitigate long-term, adverse impacts associated with such failures on surface waters and coastal wetlands

that reduce the ability of these waters and wetlands to provide natural protection against storm surge.

The project is needed because OSWS in the project area are susceptible to both capacity and treatment or disposal failures during flood and heavy rain events. Many systems in the project area failed during Hurricane Sandy and 8 other declared and undeclared flooding events since the year 2000.

3.0 PROJECT LOCATION AND BACKGROUND

Patchogue River runs through the Village of Patchogue on Long Island's south shore into Patchogue Bay, part of Great South Bay, about 17 miles east of the Fire Island Inlet and 14 miles west of the Moriches Bay Inlet (Appendix A, Figure 2). The existing Village of Patchogue Sewer District (the existing District) encompasses approximately 90 acres of developed land centered on Main Street. The project area encompasses approximately 242 acres outside the boundary of the existing District, mostly south of Main Street between Tuthills Creek and Rider Avenue, with a smaller area north of the Main Street surrounding Waverly Avenue. Existing land uses in the project area include residential, commercial, industrial, and vacant lots. Commercial and industrial properties are concentrated primarily along the Patchogue River, Patchogue Bay, Tuthills Creek, and Waverly Avenue (Appendix A, Figure 2).

The existing collection system comprises approximately 12,000 linear feet of gravity sewer, 13 miles of low-pressure sewer, and three pump stations. Sewage collected in the existing District is treated by the Patchogue AWTF, located on Hammond Street adjacent to the Patchogue River, and effluent is discharged into the Patchogue River. Approximately 50 percent of parcels in the project area have available service laterals already connected to sewer mains that were installed as part of the previous sewer extension projects, while the remaining parcels do not have sewer availability and would require additional sewer infrastructure to be installed to facilitate their connection.

Sanitary wastewater disposal in the project area, not serviced by the current sewer system, is provided by sub- and non-performing OSWS. While the exact number of system failures cannot be quantified, it is estimated that more than 50 percent of the OSWS in the project area were inundated during Hurricane Sandy and continue to be subject to failures during future storm events. On-site wastewater treatment and disposal system failures result when systems are flooded by heavy rainfall or submerged in shallow groundwater that rises during storm events, reducing system capacity and/or inhibiting or eliminating system treatment or disposal capability.

The failure of OSWS cause public health risks associated with uncontrolled sewage discharges during and after storm events, thereby creating pathways for human exposure to harmful pathogens, increasing risk to human life and property, and degrading ecosystems that protect Long Island's south shore against storm surge.

Risks to human life and property include raw (untreated) sewage backups into buildings or yards and overflows onto the land or into surface waters; health/safety hazards and costs associated with the cleanup of raw sewage backups; loss of wastewater treatment; and beach closures as a result of non-point source pollution.

In 2005, the Village accepted a *Feasibility Study for the Expansion of Sanitary Sewage Collection and Wastewater Treatment* to document the sewage collection and treatment/effluent discharge

requirements, associated capital and operation costs, and environmental and economic benefits (H2M 2005). In 2011, Suffolk County commissioned feasibility studies to evaluate alternatives and associated costs to install sanitary infrastructure in several unsewered areas of the county and recommended the expansion of existing infrastructure in the Village of Patchogue Sewer District (Suffolk County 2011). In 2014, to advance this recommendation, the Village accepted an *Engineering Report for the Coastal Resiliency and Nitrogen Mitigation Plan (CRNMP) for the Patchogue River* that provides a map and plan for the project (H2M 2014). The New York State Department of Environmental Conservation (NYSDEC) granted the out-of-district connections by letter dated April 14, 2015.

4.0 ALTERNATIVES

NEPA guidance requires that federal agencies explore and objectively evaluate all reasonable alternatives for a proposed action and, for alternatives that were eliminated from detailed study, briefly discuss the reasons for their elimination (40 CFR 1502.14). Additionally, the evaluation of a no-action alternative, also known as the “Future without Federal Project Condition” is required. This section discusses the no-action alternative and the action alternatives that would meet the project purpose and need. Two alternatives that were eliminated from further analysis are also discussed.

4.1 Alternative 1: No Action

Under the no-action alternative, no additional sewer infrastructure would be constructed to expand the collection system or connect presently unsewered parcels to the system. The unsewered parcels in the project area would continue to use OSWS, contributing to ongoing sewage backups. Effluent nitrogen concentration from existing on-site disposal systems in the project area would be about 40 milligrams per liter (mg/L) (H2M 2014). Sanitary wastewater handled by existing on-site sanitary disposal systems would continue to enter waterbodies via shallow groundwater and tidal flooding. No measures to reduce nitrogen and pathogen pollution would be pursued under the no-action alternative.

4.2 Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

The proposed action would construct upgrades to the existing sewer collection system and extend sanitary sewer service to 648 parcels outside the boundary of the existing District (Appendix A, Figure 2). This discussion of the proposed alternative reflects conceptual engineering design information available at the time of this EA. The proposed action includes four main components.

(1) *Collection System Extension*: This alternative would re-route existing sewer mains and install new bypass mains to convey sanitary flow from the newly connected parcels. Approximately 19,225 linear feet of 2 to 4-inch-diameter, high-density polyethylene (HDPE) piping would be constructed within existing paved public rights-of-way (ROWs). HDPE piping would be fused (welded) together, creating pipes with no joints. Provisions for leak detection would be incorporated during engineering design and implemented during construction to avoid, minimize, and quickly detect any potential exfiltration of sewage from a leak or break in the low-pressure sewer system. The following system improvements are proposed to provide sufficient capacity (H2M 2014):

- Disconnect the existing 4-inch-diameter, low-pressure sewer main servicing all properties south of Laurel Street from the parallel 3-inch-diameter, low-pressure sewer mains located at the intersection of West Avenue and Laurel Street.
- Install new parallel 4-inch-diameter, low-pressure sewer mains north along Cedar Avenue then west on Division Street to West Avenue to intercept all flow generated from the existing connections and proposed new connections located along Laurel Street and south of Laurel Street.
- Install new 2-inch, 3-inch, and 4-inch-diameter, low-pressure sewer mains and on-site house connection piping and low-pressure sewer grinder pump stations (LPSGPS) to connect all flow from the proposed 648 additional properties.
- Install service laterals for 291 of the 648 unsewered properties, which would require further excavation outside of paved areas from the location of the LPSGPS on each property to the new sewer main. Excavation for laterals would use a Ditch Witch or similar small bucket with the disturbance confined within a 1.5-foot-wide trench.
- Install a new cross-connection manifold at the intersection of Division Street and West Avenue to connect the parallel 3-inch and 4-inch-diameter, low-pressure sewer mains servicing properties on the west side of Patchogue River to the new parallel 4-inch-diameter, low-pressure sewer mains routed north along Cedar Avenue and west along Division Street.
- From the new cross-connection manifold, extend three 4-inch-diameter, low-pressure mains north (jacked under the Long Island Railroad [LIRR] tracks) and connect to the existing West Avenue low-pressure sewer bypass mains.

(2) *Individual Sewer Connections:* 648 individual on-site LPSGPS and 291 new home service laterals ranging in length from 25 feet to 100 feet, totaling approximately 38,500 linear feet of 1- to 2-inch-diameter HDPE piping, would be installed to connect the unsewered parcels to the system. On-site LPSGPS would be located on or near the Village ROW, as close to where the existing gravity lateral pipe exits from each home and within 25 feet from the building. All electrical and vent pipes associated with the LPSGPS would be installed at a height higher than the base flood elevation (100-year storm elevation plus 5 feet, Hurricane Sandy inundation plus 4 feet, or 500-year storm elevation; whichever is the most restrictive). The LPSGPS would be installed through an easement agreement with the property owner, and the Village would maintain the LPSGPS for the life of the easement agreement (Village of Patchogue 2015a).

The connection work would consist of:

- Installation of building drain line from the point of building exit to the LPSGPS.
- Installation of the LPSGPS, which would be supplied to the homeowner without charge by the Village.
- Installation of check valves and curb stops, as necessary.
- Electrical modifications to the home's circuit breaker panel and electrical connections to and from the LPSGPS control panel and system startup.

- Restoration of interior and exterior surfaces to match pre-construction conditions as documented by agents of the Village and verified by the homeowner prior to construction activities commencing.

(3) *Pump Station Upgrades:* Upgrades to the West Avenue Pump Station would include the replacement of the existing submersible sewage pumps to provide pumping capacity for the increased sanitary flows and the in-kind replacement of the existing 60-kilowatt (kW) diesel emergency generator to accommodate the additional 300,000 gallons per day (GPD) flow.

Flow in the existing, parallel, 3-inch-diameter, low-pressure sewer mains that currently bypasses the West Avenue Pump Station would be directed back into the pump station to re-connect the flow collected from the low-pressure sewer system servicing properties along West Avenue between Division Street and Laurel Street. This would ensure that adequate capacity is available in the West Avenue low-pressure sewer bypass for the additional flow generated by the proposed additional properties in this portion of the sewer project.

(4) *Wastewater Treatment:* Wastewater from the 648 parcels would be treated by the existing Patchogue AWTF. No improvements to the AWTF would be necessary because the existing AWTF was designed to accommodate 800,000 GPD. Presently, the AWTF treats 300,000 GPD and thus could easily accommodate the additional 300,000 GPD in sanitary flow from the project area, for a future total treatment volume of 600,000 GPD under the proposed action. The effluent from the AWTF is, and would continue to be, discharged to the Patchogue River. Using an effluent nitrogen concentration from existing on-site disposal systems as 40 mg/L and a daily wastewater volume of 300,000 GPD, the total nitrogen load generated in the project area is currently 100 pounds per day (H2M 2014). The total nitrogen concentration in the effluent would be 10 mg/L or less, according to the existing State Pollution Discharge Elimination System (SPDES) permit for the AWTF.

Construction of the proposed action is scheduled to begin in 2017 and would last approximately 31 months with new facilities operational by 2020. The installation would occur in phases with the collection system first, followed by the LPSGPS. Collection system construction of approximately 500 linear feet of pipe would be installed in one area before moving to the next area. It is estimated that every 500-linear-foot pipe section would take approximately one and a half weeks to install. The construction staging area would be the Village property on Hammond Street, where the AWTF is located.

4.3 Alternative 3: Vacuum Sewer Extension

Alternative 3 would construct upgrades to the existing sewer collection system and extend sanitary sewer service. A total of 388 parcels would be served by the vacuum sewers, or 40 percent fewer than the low-pressure system alternative (Alternative 2). Vacuum sewers, like low-pressure sewers, are often used in conditions where there is a natural limited slope, flat sandy soils, and high groundwater. This alternative includes four main components. Vacuum sewers are limited to total static head less than 10 feet.

(1) *Collection System Extension:* Rather than use low-pressure sewers as described in Alternative 2, this alternative would use vacuum sewer infrastructure. Approximately 11,535 linear feet of 6-inch-diameter, HDPE piping would be constructed within existing paved public ROW. Like Alternative 2, HDPE piping would be fused (welded) together, creating pipes with no joints, and provisions for leak detection would be incorporated during engineering design and implemented

during construction to avoid, minimize, and quickly detect any potential exfiltration of sewage from a leak or break in the low-pressure sewer system.

The collected sewage would be held in a large receiving tank and pumped to the nearest gravity collection system manhole or to the existing AWTF via a 6-inch, large-diameter force main. This alternative would require larger diameter sewer piping in the ROW than the low-pressure system because the common force main that conveys the sewage from the central vacuum station to the AWTF would be 6-inches in diameter, larger than the 4-inch mains in the low-pressure sewers in Alternative 2.

The following system improvements would be constructed to provide sufficient capacity:

- Install new parallel 6-inch-diameter common vacuum sewer force mains to direct flow to the AWTF. These mains would be installed similar to Alternative 2, north along Cedar Avenue then west on Division Street to West Avenue, to intercept all flow generated from the existing connections and proposed new connections located along Laurel Street and south of Laurel Street.
- Similar to Alternative 2, disconnect the existing 4-inch-diameter, low-pressure sewer main servicing all properties south of Laurel Street from the parallel 3-inch-diameter, low-pressure sewer mains located at the intersection of West Avenue and Laurel Street.
- Install new 3-inch diameter, vacuum sewer mains and on-site gravity house connection piping to connect all flow from the proposed 388 additional properties. Unlike Alternative 2, LPSGPS would not be required for each parcel. A valve pit chamber would be required for every two parcels to control flow.
- Install gravity service laterals for the 388 unsewered properties to the new sewer main.

(2) *Individual Sewer Connections*: Each property would be gravity connected to a vacuum valve system-receiving pit located in the street. As the receiving pit is filled with sanitary sewage from a home or business, a differential pressure switch would open the vacuum line valve, and the pit would be emptied. Two parcels would share one valve chamber, which would be located within the ROW. A total of 388 individual on-site gravity sewer pipes and new home service laterals ranging in length from 25 feet to 100 feet, totaling approximately 15,400 linear feet of 1- to 2-inch-diameter HDPE piping, would be installed to connect the unsewered parcels to the system. No on-site LPSGPS would be required, and there would be no electrical components at the individual connections to the system.

The connection work would consist of:

- Installation of building drain line from the point of building exit to the vacuum valve system-receiving pit located in the street
- Installation of the vacuum valve system-receiving pit located in the street
- Installation of check valves and curb stops, as necessary
- Restoration of interior and exterior surfaces to match pre-construction conditions as documented by agents of the Village and verified by the homeowner prior to construction activities commencing

(3) *New Central Vacuum Pump Station*: One central vacuum station would be constructed to service the sewer extension area. It is assumed that the central vacuum station would be located

on property not yet owned by the Village. All the sewage collected in the system-receiving pits would be drawn to the central vacuum station by a constant vacuum pressure on the collection piping. At the pumping station, the mains would empty into a collection tank. Pumps at the central vacuum station would pump the collected sewage to the existing AWTF. A diesel emergency generator, assumed to range from approximately 30 to 40 kW, would be installed at the vacuum pump station.

(4) *Wastewater Treatment:* Wastewater from the 388 parcels would be treated by the existing Patchogue AWTF. No improvements to the AWTF would be necessary because the existing AWTF was designed to accommodate 800,000 GPD. Presently, the AWTF treats 300,000 GPD and thus could easily accommodate the additional estimated 180,000 GPD in sanitary flow from the project area, for a future total treatment volume of 480,000 GPD under the proposed action. Like Alternative 2, the effluent from the AWTF would continue to be discharged to the Patchogue River.

Construction of the proposed action would begin in 2017 and would last approximately 12 months, with the new facilities operational by 2019. Installation of the collection system would be first, followed by the on-site gravity driven service laterals. Like Alternative 2, collection system construction would occur in phases with installation of approximately 500 linear feet of pipe in one area before moving to the next area. It is estimated that every 500-linear-foot pipe section would take approximately one and a half weeks to install. The construction staging area would be located on Village property on Hammond Street, where the AWTF is located.

4.4 Alternatives Considered and Dismissed

Two other alternatives were considered and dismissed, as discussed below.

4.4.1 Gravity Sewer Extension

This alternative would install a sewer extension that would collect sanitary sewage via gravity. Gravity sewers function best in areas characterized by appropriate topographic conditions creating gravity differentials (slopes) and deeper groundwater levels. This alternative would have low operation and maintenance costs and a long life cycle. However this option was dismissed because the flat terrain and high groundwater table of the project area would require deeper and more extensive excavation and extensive dewatering work during construction. Because of the prevailing conditions, gravity collection systems would not be cost effective for the proposed sanitary service area (H2M 2005).

4.4.2 Central Pump Stations

Under this alternative, central pump stations would be installed that that would collect sanitary sewer via a gravity-driven, low-pressure or vacuum collection system that radiates out from the central pump station. This alternative was dismissed because it would require the purchase of a site and the construction of a central pump station, thereby requiring deeper sewer lines, and more extensive excavation than other alternatives. It would also require extensive dewatering work during construction. Because of these factors, central pump stations would not be cost effective for the proposed sanitary service area (H2M 2005).

4.5 Summary Evaluation of Alternatives

The subrecipient considered several alternatives for implementation of the proposed action (H2M 2005). Two alternatives—the gravity sewer extension and central pump stations alternatives—were dismissed from further evaluation because of technical constraints and cost considerations. The three remaining alternatives evaluated in this EA are:

- Alternative 1: No-action alternative
- Alternative 2: Out-of-district low-pressure sewer extension alternative
- Alternative 3: Vacuum sewer extension alternative

The following impact analyses evaluate the potential environmental impacts of the three alternatives. Most of the evaluations focus on the construction period, when short-term disruptions to the human environment would be experienced. A table summarizing the potential impacts of the three alternatives is provided in Section 10.0, *Summary of Impacts*.

5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This section discusses the potential impacts of the project alternatives on several categories of environmental and cultural resources. The potential cumulative environmental impacts are also discussed (see Section 5.16). Potential impacts include effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems (40 CFR 1508.8).

When possible, quantitative information is provided to establish potential impacts, and the potential impacts are evaluated qualitatively based on the criteria listed in Table 1.

Table 1. Evaluation Criteria for Potential Impacts

Impact Scale	Criteria
No Effect	The resource area would not be affected, and there would be no impacts.
Negligible	Changes would either be non-detectable or, if detected, the effects would be slight and local. Impacts would be well below regulatory standards, as applicable.
Minor Adverse	Changes to the resource would be measurable, but the changes would be small and localized. Impacts would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate Adverse	Changes to the resource would be measurable and have both localized and regional impacts. Impacts would be within or below regulatory standards, but historical conditions would be altered temporarily. Mitigation measures would be necessary, and the measures would reduce any potential adverse effects.

Impact Scale	Criteria
Major Adverse	Changes to the resource would be readily measurable and would have substantial consequences at local and regional levels. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, but long-term changes to the resource would be expected.
Beneficial	There would a positive effect on the resource.

5.1 Geology, Soils, and Topography

5.1.1 Existing Conditions

Long Island is underlain by a mass of wedge-shaped, unconsolidated geological deposits of sand, gravel, silt, and clay that overlie southward-sloping, consolidated bedrock. The thickness of these unconsolidated, glacial, and deltaic deposits ranges from over 2,000 feet along the south shore barrier beaches of Suffolk County, to a few hundred feet in the northwestern sections of Nassau County. This sequence of unconsolidated deposits consists of several distinct geological units ranging from late Cretaceous through Pleistocene, with some recent deposits near shores and streams.

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) has mapped the soils in the study area (Appendix A, Figure 3). The study area comprises three predominant soil types, including gently sloping cut and fill land, the sands of the Carver and Plymouth series, and fill land composed of dredged material. Water, Deerfield sand, Tidal marsh, Plymouth loamy sands (0 to 3 percent slopes), and Urban land complete the soil units present (Table 2) (USDA-NRCS 2015).

Of these materials, only the Plymouth loamy sands were assigned an erosion hazard factor (K factor). This K factor is 0.1. These sands make up approximately 0.2 percent of the study area. Hydric soils are also present in the study area, but only 8.1 acres (3 percent) of the soils in the study area have a hydric rating. These units include Deerfield sand and Tidal marsh (USDA-NRCS 2015).

Farmland of Statewide Importance comprises two percent of the study area, with a total of approximately 6 acres out of the total 270 acres (Appendix A, Figure 3). Although farmland is present, the Farmland Protection Policy Act, which requires federal agencies to take into account potential adverse effects of their actions on the preservation of farmland, does not apply to farmland within municipal boundaries; thus, the proposed action does not require a farmland impact analysis.

Table 2. Soil Types within the Study Area

Map Unit Symbol	Map Unit Name	Acres in Area of Impact	Percent of Area of Impact	Erosion Hazard (K factor)	Hydric Rating	Farmland Classification
CpA	Carver and Plymouth sands, 0 to 3% slopes	36.1	13.4%	Not rated or not available	0	Not prime farmland
CuB	Cut and fill land, gently sloping	202.3	74.9%	Not rated or not available	0	Not prime farmland
De	Deerfield sand	5.3	1.9%	Not rated or not available	5	Farmland of statewide importance
Fd	Fill land, dredged material	14.8	5.5%	Not rated or not available	0	Not prime farmland
PIA	Plymouth loamy sand, 0 to 3 % slopes	0.6	0.2%	0.1	0	Farmland of statewide importance
Tm	Tidal marsh	2.8	1.0%	Not rated or not available	95	Not prime farmland
Ur	Urban land	0.1	0.0%	Not rated or not available	0	Not prime farmland
W	Water	8.3	3.1%	Not rated or not available	0	Not prime farmland

The topography of the project area is generally flat, with a gradual downward slope towards the watercourses. The majority of the project area is at an elevation of approximately 5 to 10 feet above sea level, with the northwestern portion of the project area off of Waverley Avenue at a higher elevation of 20 to 30 feet above sea level.

5.1.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the no-action alternative, no construction would occur, and there would be no temporary effects on geology, soils, or topography. The unsewered parcels in the project area would continue to use OSWS, allowing existing issues to continue unabated. However, because the current systems have been in place for a long period of time, soil contamination resulting from the existing OSWS is likely at an equilibrium point (NCSUCE 1999). As long as there is no additional build-out or construction of additional OSWS, the no-action alternative would have no impact on existing geological and topographic resources and will continue to have a minor negative impact to soils.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Under Alternative 2, there would be no impact on the geology of the area. Excavation for the project is limited to four feet below the ground surface, a depth that corresponds to unconsolidated glacial and deltaic material (i.e., soil). Bedrock in the project area lies more than 2,000 feet from surface and would not be impacted by excavation activities.

Trench digging for sewer mains and laterals and other soil disturbances would be part of the construction of the proposed action, resulting in minor, short-term local impacts on project area

soil resources during construction of the sewer extension. These short-term impacts include the temporary removal and displacement of soil. Excavation would be required for the sewer mains under existing paved roadways. Lateral connections would be needed for 291 of the 648 unsewered properties and would require further excavation outside of paved areas from the location of the LPSGPS on each property to the new sewer main. Excavation for laterals would use a Ditch Witch or similar small bucket with the disturbance confined within a 1.5-foot-wide trench. On-site LPSGPS installation would likely require an additional, negligible amount of ground disturbance because units would be buried underground near existing septic tanks or cesspools. Suitable soils would be placed back into utility trenches and compacted, and the remaining excavated material would be hauled by the contractor to a NYSDEC-regulated facility in compliance with applicable local, state and federal rules and regulations.

Best management practices (BMPs), including soil and erosion control measures, would be employed during construction to minimize potential temporary soil erosion from stockpiles and trench walls due to rainfall. These measures would be specified as part of the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity permit application, which would also include an Erosion and Sediment Control Plan and Stormwater Pollution Prevention Plan (SWPPP). Overall, the proposed action would result in negligible soil impacts during construction.

The proposed action would also have a negligible effect on topographic features within the project area due to trenching and filling. Trenches excavated for the new utilities would be backfilled and restored to pre-construction conditions. There would be no changes in the land elevation or slope.

Under conditions of normal operation, the proposed action would have no impact on soil resources. However, if any seals or pipes were to fail, sewage would leak out into the surrounding soils for the duration of the failure, resulting in a minor impact.

Alternative 3: Vacuum Sewer Extension

Alternative 3 would result in similar impacts to those described under the proposed action. There would be no effect on geological resources, and construction would result in minor, short-term impacts on soil resources as a result of ground disturbance and excavation. While Alternative 3 would not require LPSGPS at each property or lateral connections to 291 properties, it would include the installation of vacuum valve system receiving pits for each property to be sewer (as described in Section 4.3), as well as the construction of the central vacuum station. It also would require larger diameter sewer mains. Relative to the proposed action, installation of the vacuum sewer collection pipeline would require additional excavation because larger sewer mains would need to be routed from the new vacuum station to the Patchogue AWTF. Overall, Alternative 3 would result in relatively greater amounts of soil disturbance and excavation than the proposed action. However, similar to the proposed action, suitable soils would be placed back into utility trenches and compacted, and the remaining excavated material would be hauled by the contractor to a NYSDEC-regulated facility in compliance with applicable local, state, and federal rules and regulations.

Alternative 3 would incorporate BMPs in the SWPPP and Soil and Erosion Plan elements of the SPDES permit application to reduce temporary soil erosion effects due to rainfall. The impact resulting from operation described under the proposed action would also apply to Alternative 3.

Alternative 3 would also backfill and restore trenches to pre-construction conditions, resulting in negligible impact to the land elevation or slope.

5.2 Air Quality

The Clean Air Act of 1970 (42 USC 7401–7661 [2009]) is a comprehensive federal law that regulates air emissions from area, stationary, and mobile sources. The act authorized the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. The NAAQS include standards for six criteria air pollutants: lead, nitrogen dioxide, ozone, carbon monoxide, sulfur dioxide, and particulate matter (including both particulate matter less than 10 micrometers in diameter [PM₁₀], and fine particulate matter less than 2.5 micrometers in diameter [PM_{2.5}]). Areas where the monitored concentration of a criteria pollutant exceeds the applicable NAAQS are designated as being in non-attainment of the standards; while areas where the monitored concentration of a criteria pollutant is below the standard are classified as in attainment. Non-attainment areas can be re-designated as a maintenance area if monitoring data demonstrate that a non-attainment area meets the NAAQS and a 10-year plan for continuing to meet and maintain such standards is implemented.

Federally funded actions in nonattainment and maintenance areas are subject to EPA conformity regulations (40 CFR Parts 51 and 93), which ensure that emissions of air pollutants from planned federally funded activities would not affect the state's ability to meet the NAAQS. Section 176(c) of the Clean Air Act requires that federally funded projects conform to the purpose of the State Implementation Plan (SIP), meaning that federally funded activities would not cause any violations of the NAAQS, increase the frequency or severity of NAAQS violations, or delay timely attainment of the NAAQS or any interim milestone.

The conformity requirements of the Clean Air Act and its regulations limit the ability of federal agencies to assist, fund, permit, and approve projects that do not conform to the applicable SIP. When subject to this regulation, the federal agency is responsible for demonstrating conformity for its proposed action. Conformity determinations for federal actions other than those related to transportation plans, programs, and projects that are developed, funded, or approved under title 23 USC or the Federal Transit Act (49 USC 1601 et seq.) must be made according to the federal general conformity regulations (40 CFR 93 Subpart B). Certain actions and activities are exempted from general conformity review, including the following:

- Stationary source emissions regulated under major or minor New Source Review (air permitting) programs
- Alteration and additions of existing structures as specifically required by new or existing applicable environmental legislation
- Actions where the emissions are not reasonably foreseeable
- Actions that have been defined by the federal agency or by the state as “presumed to conform”
- Activities with total direct or indirect emissions (not including stationary source emissions regulated under New Source Review programs) below *de minimis* levels. Emissions from construction activities are subject to air conformity review, unless they are shown to be below the applicable *de minimis* levels

5.2.1 Existing Conditions

NAAQS and New York State Ambient Air Quality Standards that would be applicable to the project site are presented in Appendix D. Suffolk County is a nonattainment area for the 1997 and 2008 8-hour ozone standards, and a maintenance area (former nonattainment area) for PM_{2.5}.

The existing West Avenue Pump Station and the Patchogue AWTF do not produce criteria pollutant air emissions under normal operations and therefore do not require permits for emissions from stationary sources (Village of Patchogue 2015b). The West Avenue Pump Station has a 60-kW diesel emergency backup generator, while the Patchogue AWTF has a 300-kW diesel emergency backup generator. The potential emissions from the 300-kW generator were quantified based on emissions testing information available for similar capacity emergency backup generators (Caterpillar 2015a, b). The 30-kW generator emissions were quantified based on EPA's AP-42 Compilation of Air Pollutant Emission Factors Section 3.3 (EPA 1996). As a conservative assumption, the quantification of emissions assumed 500 hours per year of operation (testing plus emergency use) for each generator. The resulting emissions are provided in Table 3. The generator emissions are well below the general conformity *de minimis* criteria.

Table 3. Existing Backup Generator Emissions

Criteria Pollutant	Estimated Annual Emissions (tons/year)
NOx (Nitrogen Oxides)	1.68
CO (Carbon Monoxide)	0.19
HC (Hydrocarbons)	0.08
PM (Particulate Matter)	0.05

5.2.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the no-action alternative, no temporary construction emissions would occur, and there would be no change in existing levels of permanent criteria emissions. The no-action alternative would have a continued negligible impact on air quality from the existing generators.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Construction of Alternative 2 would result in short-term, temporary emissions of pollutants that include carbon monoxide, PM_{2.5}, PM₁₀, and ozone precursors from mobile equipment, including jackhammers to break pavement, excavators or backhoes to dig the trenches, small cranes or backhoes to lower piping into the trench, and trucks and paving machines to repave the roadway. These construction equipment and activity-related emissions would be well below the general conformity *de minimis* thresholds and would be controlled through the implementation of standard construction BMPs that include covering haul trucks and soil piles, restoring/replanting areas where vegetation is disturbed to prevent erosion and dust, and limiting idling to five minutes or less in accordance with New York State regulations (6 New York Codes, Rules and Regulations [NYCRR] Subpart 217-3).

There would be no change in air quality from the long-term operation of Alternative 2. An in-kind replacement of the existing 60-kW generator at the West Avenue Pump Station would not change existing emissions, and the existing 300-kW generator at the AWTF would remain. A mobile source air quality impact analysis for the direct impacts of the proposed action is not necessary because the provision of sewer infrastructure would have no long-term effect on trip generation or traffic patterns.

Additionally, the proposed action is not likely to result in significant induced growth, as discussed in Section 5.8, *Land Use and Planning*. Therefore, Alternative 2 would have a negligible, short-term, adverse impact on air quality during construction in terms of criteria pollutants and no additional long-term impact.

Alternative 3: Vacuum Sewer Extension

Alternative 3 would lead to minor, short-term, adverse impacts on air quality during construction, similar to the impacts described for Alternative 2. Short-term impacts would be slightly increased when compared to Alternative 2 because of the need to construct the central vacuum pump station associated with Alternative 3. There would be no effect on air quality from the long-term operation of Alternative 3.

5.3 Water Resources

5.3.1 Existing Conditions

5.3.1.1 Water Quality

Congress enacted the Federal Water Pollution Control Act in 1948 that was later reorganized and expanded in 1972 and became known as the Clean Water Act (CWA) in 1977. The CWA regulates discharge of pollutants into water with sections falling under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and EPA. Section 404 of the CWA establishes the USACE permit requirements for discharging dredged or fill materials into waters of the United States and traditional navigable waterways. USACE regulation of activities within navigable waters is also authorized under the 1899 Rivers and Harbors Act. Under the National Pollution Discharge Elimination System, EPA regulates both point and non-point pollutant sources, including stormwater and stormwater runoff. EPA has authorized NYSDEC to administer the National Pollution Discharge Elimination System program, which is the SPDES. Activities that disturb 1 acre of ground or more require an SPDES permit. NYSDEC monitors the water quality of surface waters under the CWA, ensures compliance with existing water quality standards, and produces an inventory of impaired waters.

Section 1424(e) of the Safe Drinking Water Act of 1974 [Public Law 93–523] authorizes EPA to designate an aquifer for special protection under the sole source aquifer program if the aquifer is the sole or principal drinking water resource for an area (i.e., it supplies 50 percent or more of the drinking water in a particular area) and if its contamination would create a significant hazard to public health. No commitment for federal financial assistance may be provided for any project that EPA determines may contaminate a sole source aquifer such that a significant hazard to public health is created.

The Suffolk County Department of Health Services also enacted policies to protect water quality and groundwater to ensure the availability of an adequate and safe source of water supply (Suffolk

County 2011). The code establishes standards for the construction, operation, and discharge of treatment and disposal systems. The county is separated into eight groundwater management zones based on differences in hydrogeology and groundwater quality; the code established flow limitations for parcels within each zone based on maintaining a maximum total nitrogen concentration in groundwater of 10 mg/L. The Village of Patchogue is located within groundwater management zone VI, in which the sanitary flow limitation is 300 GPD per acre.

Waterbodies within and adjacent to the project area boundaries consist of the estuarine Patchogue River (center), Tuthills Creek (along the western boundary), and Patchogue Bay as part of Great South Bay (along the southern boundary). There are no freshwater surface waters within the project area; Great Patchogue Lake is located east of the northernmost section of the project area and approximately 0.5 mile to the north of the remaining portion of the project area. These waterbodies are described in more detail below.

Estuarine Waterbodies

NYSDEC administers classifications of various waterbodies (6 NYCRR 701) that are a standard indication of what is the best usage of that water resource (NYSDEC 2014d). Patchogue Bay is classified as SA surface waters (6 NYCRR 922.4), and the Patchogue River and Tuthills Creek are classified as SC surface waters. Patchogue River and Tuthills Creek both drain to Patchogue Bay, which is part of the Great South Bay and South Shore Estuary Reserve system. Great South Bay is listed on the 2014 New York State Section 303(d) List of Impaired/Total Maximum Daily Load (TMDL) Waters (NYSDEC 2014), which identifies those waters that do not support appropriate uses and that may require development of a TMDL. The cause for the listing was excessive nitrogen loading as a result of OSWS and urban runoff. Other tributary embayments such as Patchogue Bay were considered for listing; however, decisions regarding these additional listings have been deferred pending further study regarding the occurrence of harmful algal blooms (“brown tide”) and an understanding of the dynamics of the system necessary for the development of an effective TMDL.

Patchogue Bay and its tributaries, including Tuthills Creek and Patchogue River, are included in the most current Waterbody Inventory/Priority Waterbodies List for the waters of the Atlantic Ocean/Long Island Sound Basin (NYSDEC 2011). Patchogue Bay is listed as impaired due to pathogens; the source of the pollution is listed as urban/stormwater runoff as well as municipal wastewater, inadequate OSWS, boat discharges, and waterfowl. The pathogen contamination results in restrictions on shellfishing for consumption purposes and periodic beach closures, impairing public bathing and other recreational uses. The Patchogue River is listed for suspected nutrient and silt/sediment loading from the stormwater runoff and inadequate or failing OSWS, affecting aquatic life.

Great Patchogue Lake

NYSDEC classifies Great Patchogue Lake as Class B fresh surface water (6 NYCRR 922.4). Great Patchogue Lake is known to experience invasive aquatic weed growth, sedimentation, turbidity, and nutrient loading that could result in algal blooms. Similar to the loading of estuarine waters, poor stormwater management practices, lawn fertilization, large waterfowl populations, and failing on-site septic systems within the Patchogue River Watershed have resulted in excessive nutrient and sediment loads.

Groundwater

Groundwater in Suffolk County comprises a designated sole source aquifer under the Safe Drinking Water Act. This aquifer is the only source of potable water for the roughly 1.5 million residents. The Upper Glacial, Magothy, and the Lloyd Aquifers are present in the project area. The Upper Glacial Aquifer establishes the water table in the Village of Patchogue. Physical characteristics for the water-bearing units in south-central Suffolk County are provided in Table 4.

Table 4. Physical Characteristics for the Upper Glacial, Magothy, and Lloyd Aquifers

Aquifer	Area (square miles)	Average Thickness (feet)	Average Hydraulic Conductivity (GPD per square foot)	Average Transmissivity (GPD per foot)	Main Body Flow Model Present Day Water Balance (MGD)
Upper Glacial	141	120	1,900	230,000	1,133
Magothy	141	900	360	320,000	33
Lloyd	141	300	270	80,000	23

Source: McClymonds and Franke 1972; Suffolk County 2015a

NOTE: GPD = gallons per day, MGD = million gallons per day. Values based on mainland Long Island only; the North and South Fork were not included in these calculations.

Based on potentiometric surface maps and depths to groundwater measured in this area, the Village of Patchogue is located in a regional groundwater discharge zone. Groundwater moves out of the Upper Glacial Aquifer and into any local surface waterbodies, such as the Patchogue River, Great Patchogue Lake, West Lake, the unnamed lake northwest of West Lake, Tuthills Creek, West Lake, and Patchogue Bay. Based on measurements collected in the Village of Patchogue in 2009, the depth to groundwater at five locations ranged from 0.4 to 3.3 feet below the top of the well casing (Appendix A, Figure 4).

The Village of Patchogue is supplied with potable water by the Suffolk County Water Authority Distribution Area 1 (Suffolk County Water Authority 2015), which delivers water to homes, schools, fire hydrants, and wherever else potable water is needed. The Suffolk County Water Authority has two well fields in Patchogue: the single Waterworks Road well and the Barton Avenue well field with five individual wells. The Waterworks Road well, located west of River Avenue and between the Montauk Highway and the LIRR tracks, is the closest to the Village, but it is only pumped during periods of high demand because of its high iron content. The Barton Avenue well field, which is located north of the Sunrise Highway and east of Route 112, serves as village’s primary source of water. A 10-inch water main runs along River Avenue; all of the roads east of the Patchogue River are serviced by 6-inch water mains (Village of Patchogue 2008). The Barton Avenue well field is located two miles to the northeast of the AWTF; therefore, the zone of contribution to the well field would not be affected by the effluent discharge from the AWTF. The single Waterworks Road well is located approximately 0.25 mile to the west of the AWTF. Its zone of contribution is also not expected to be affected by the AWTF effluent discharge because the well is located in the Tuthills Creek watershed, while the effluent from the AWTF is discharged

directly into Patchogue River rather than to the groundwater via infiltration. Furthermore, the Waterworks Road well is screened in the Magothy aquifer at a depth of 360 feet rather than in the shallower Upper Glacial aquifer.

In 2009, the U.S. Geological Survey, the Village of Patchogue, the New York Department of State, and the Suffolk County Department of Health Services conducted an investigation into the quality of shallow groundwater in the Village of Patchogue. Specifically, water quality samples were collected from 10 shallow wells within the Village to document the effects of on-site wastewater disposal on groundwater discharging into the Patchogue River. Sampling was performed prior to the start of seasonal fertilizer application. Each sample was analyzed for physical properties (pH, dissolved oxygen, specific conductance, and temperature), nutrients, organic carbon, major ions, and trace elements. Water samples from eight wells were analyzed for stable isotopes of nitrogen. The nitrate concentration in one well was 40 mg/L, which exceeded the EPA and New York State Department of Health maximum contamination level in drinking water of 10 mg/L. Sodium concentrations at nine wells exceeded the EPA Drinking Water Advisory Taste Threshold of 60 mg/L. Dissolved iron concentrations at three wells exceeded the New York State Department of Health and EPA Secondary Drinking Water Standard of 0.3mg/L. Local variations in measured ammonia, nitrate, total nitrogen, phosphorus, and organic carbon concentrations and nitrogen isotope signatures indicated that nitrate enters the surficial aquifer from several sources (fertilizer, septic waste, and animal waste) (Abbene 2010).

5.3.1.2 Wetlands

Wetlands are areas that are inundated or saturated by surface or groundwater with a frequency and duration sufficient to support a prevalence of vegetation or aquatic life typically adapted for those soil conditions. Actions that could impact wetlands require review under several regulatory programs, including Section 404 of the CWA (33 USC 1344). Additionally, Executive Order (EO) 11990, Protection of Wetlands, requires that all federally funded, permitted, or sponsored projects affecting wetlands demonstrate that there are no practicable alternatives, and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use. FEMA uses the eight-step decision-making process to evaluate potential effects on, and mitigate impacts to, wetlands and floodplains in compliance with EO 11990 and EO 11988. NYSDEC administers and regulates wetlands in New York State under the Freshwater Wetlands Act (Article 24 of Environmental Conservation Law) and the Tidal Wetlands Act (Article 25 of Environmental Conservation Law).

A review of the U.S. Fish and Wildlife (USFWS) National Wetlands Inventory indicates the project area is not located in a mapped wetland or in U.S. waters. National Wetlands Inventory wetlands adjacent to the project area include Estuarine and Marine Deepwaters of Patchogue River, Tuthills Creek, and Patchogue Bay and Estuarine and Marine Wetlands within Tuthills Creek. NYSDEC wetlands are mapped near the project area, in association with upstream portions of Tuthills Creek, Patchogue River, and Patchogue Lake (Appendix A, Figures 5 and 6).

The NYSDEC Environmental Resource Mapper identifies portions of the project area adjacent to the state-regulated wetlands as being within a Wetland Checkzone, or an area around a mapped wetland in which the actual wetland may occur. Under the Tidal Wetlands Act, NYSDEC regulates activities in wetlands and their adjacent areas up to 300 feet from tidal wetland boundaries and up to 100 feet from freshwater wetland boundaries. Portions of the project area are within the adjacent

areas of nearby freshwater and tidal wetlands. There are no NYSDEC identified and mapped state-regulated wetlands within the project area.

5.3.1.3 Floodplains

EO 11988, Floodplain Management, requires federal agencies to avoid, to the extent possible, potential adverse impacts associated with the occupancy and modification of floodplains, and avoid floodplain development whenever there are practicable alternatives. If there is no practicable alternative to undertaking an action in a floodplain, any potential adverse impacts must be mitigated. FEMA regulations for complying with EO 11988 are contained in 44 CFR Part 9. Federal actions within the 100-year floodplain require the federal agency to conduct an eight-step review process to evaluate alternatives within floodplains as described in wetlands section above.

Flood Insurance Rate Map (FIRM) panels 36103C0694H and 36103C0907H (Appendix A, Figures 7 and 8) indicate that approximately 108 acres (39 percent) of the project area is located within the 100-year floodplain, predominantly within AE Zone 5-6 feet base flood elevation (North American Vertical Datum of 1988 [NAVD88]) with a minimal area in the VE Zone 7 feet base flood elevation (NAVD88). An additional approximately 3 percent of the site is located in the 500-year floodplain, X shaded or 0.2-percent chance annual flood. The eight-step floodplain review process for the proposed action is provided in Appendix F.

As previously stated, the project area is subject to heavy rainfall events that lead to regular surface water flooding, groundwater flooding, and a combination of both ground and surface water flooding with varying intensity and frequency. A total of 80 percent of the project area has a shallow groundwater depth of less than 10 feet. The project area has experienced more intense flooding during events such as Hurricane Sandy in 2012, when more than 52 percent of the project area was inundated by tidal surge; Hurricane Irene in 2011; and other unnamed seasonal storms, nor'easters, and hurricanes. Such flooding conditions are likely to increase as a result of climate change, with rising sea levels and increasing frequency or severity of storm events and is discussed in Section 5.15, *Climate Change*.

5.3.1.4 Coastal Resources

The Coastal Zone Management Act is administered by states with shorelines that delineate coastal zones and develop a Coastal Zone Management Plan (CZMP) to manage coastal development. Projects falling within designated coastal zones must be evaluated to ensure they are consistent with the CZMP. In New York State, local communities can have control over their own coastal areas by developing a Local Waterfront Revitalization Program (LWRP). When approved by the state, this LWRP takes the place of the CZMP for consistency requirements. Projects receiving federal assistance must follow the procedures outlined in 15 CFR 930.90–930.101 for federal coastal zone consistency determinations. To guide development and resource management within the state's coastal area, the New York State Department of State and NYSDEC have identified and promulgated substantive policies.

The Coastal Barrier Resources Act of 1982 created designated areas that were made ineligible for both direct and indirect federal expenditures. This act was amended by the Coastal Barrier Improvement Act of 1990, which added a new category of coastal barriers called Otherwise Protected Areas (USFWS 2015).

The majority of the project area is located within the boundary of the New York State Coastal Zone; therefore, it must be consistent with the State's Coastal Zone management policies (Appendix A, Figure 9). It also falls within the boundaries of the areas covered by the Village of Patchogue draft LWRP, which dictates how the Village wants to manage its coastal zone. Because it has not yet been adopted, the LWRP does not replace the requirements of New York State's CZMP. A Federal Consistency Assessment Form and supporting documentation for the proposed action are provided in Appendix C. The site does not fall within any coastal barrier resource or otherwise protected areas (Appendix A, Figure 10). Several parks within the project area provide residents with public access or views of the waterfront.

5.3.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Water Quality

The no-action alternative would maintain the risk of discharge of sanitary wastewater from failing OSWS to the Patchogue River and Patchogue Bay in the event of future flooding. Overflowing wastewater would continue to be transported into these surface waters either through point or non-point source runoff, or after first infiltrating into the groundwater and discharging later into these surface waters. Continued pollution from future flooding could affect these waterbodies, damaging habitat and causing adverse conditions for local plant and wildlife species that depend on the habitat, and could contribute to the deterioration of ecosystem functions in the Great South Bay. Contamination would not affect the deeper sole source aquifers that provide drinking water. The no-action alternative would result in moderate, adverse impacts on water quality during flood events.

Wetlands

Under the no-action alternative, there would be no construction and, therefore, no impact on wetlands from fill. Continued release of contaminants from OSWS failure during flood events could contribute to the destabilization of tidal wetlands along the Patchogue River and Patchogue Bay. Nitrogen and pathogen contamination of underlying groundwater and the downgradient surface waters contributes to the deterioration of ecosystem functions in the Great South Bay. Excessive nitrogen loading results in fewer roots and rhizomes of wetland plants (NYSDEC 2014b). Poorly rooted plants eventually grow too tall and topple over, resulting in weakened wetland edges. Weakened edges are more susceptible to erosion and slumping from waves and tidal flows, resulting in landward encroachment of the shoreline.

The loss or degradation of coastal wetlands decreases their protective functions of reducing wave energy and amplitude, slowing water velocity, reducing flood height and storm surge, and stabilizing the shoreline through sediment deposition. These effects of capacity failures on coastal wetlands can persist for extended periods of time following flood events. Therefore, the no-action alternative would have potential for moderate, long-term, adverse impacts on wetlands within the project area.

Floodplains

Under the no-action alternative, there would be no construction or fill; therefore, there would be no further effect on capacity of floodplains. The no-action alternative would promote the continued

weakening of flood mitigation benefits provided by tidal wetlands systems in the Patchogue River and Patchogue Bay. Tidal wetland vegetation submergence depth and stem density strongly influence wave attenuation by dissipating the wave energy associated with tidal flooding (Anderson et al. 2013). Higher wave energy results in higher erosion rates and greater landward propagation of floodwaters during storm surge events, increasing the floodplain area. Healthy coastal vegetation can reduce the likelihood and magnitude of losses associated with flooding from extreme weather and sea-level rise. Therefore, the increasing degradation of coastal wetland vegetation due to nitrogen loading from future failures of OSWS would increase the vulnerability of coastal communities to flooding from storm surge and sea-level rise. This increased vulnerability to flooding would result in increased contamination from OSWS failures during flood events, further compounding the impact. The no-action alternative would result in continued moderate, long-term, adverse impacts on floodplains.

Coastal Resources

The no-action alternative would not protect coastal resources, nor would it advance any of the policies of the state's CZMP or the village's LWRP and as such would be inconsistent with the Coastal Zone Management Act. Existing on-site wastewater treatment systems would remain subject to leaking nitrogen and pathogens into the Patchogue River and Patchogue Bay, or into the groundwater that eventually flows to the coastal waters. Storm events and flooding would continue to exacerbate these releases from on-site treatment systems, causing total failure in some cases. The continued release of nitrogen and pathogens could affect recreational activities and tourism through beach closures, as well as commercial activities through reduced shellfish populations that impact the shellfishing industry, resulting in minor, localized, long-term adverse impacts on coastal resources.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Water Quality

No work would be within or near the vicinity of identified waterbodies. Potential impacts from soil erosion on nearby waterways during construction would be minimized through BMPs, including construction site stabilization, dust control, sediment traps, temporary swales, and temporary or permanent seeding (NYSDEC 2005). Construction would require excavation and dewatering resulting in a minor, short-term, adverse impact on water quality and mitigation would be accomplished through use of BMPs for water management and adherence to all applicable local, state, and federal regulations.

Implementation and operation of the proposed action would minimize the risk of future releases of sanitary wastewater into nearby waterways during future flood events. The water quality impacts of the proposed action would be beneficial because loading of nitrogen and pathogens to Patchogue River and Patchogue Bay during such events would be reduced.

Wastewater from the 648 parcels would be collected and treated at the AWTF. The Patchogue Village Sewer District holds a SPDES permit for 800,000 GPD (Permit No. NY0023922) (Suffolk County 2015b) and the permit would not need to be revised. The total nitrogen concentration in the effluent is projected to be 10 mg/L or less. There should be no discharge of pathogens in the effluent after treatment.

The rate of recharge of the groundwater would be reduced by the volume of wastewater that would be collected from the 648 parcels by the proposed action (i.e., approximately 300,000 GPD). This loss would have a negligible, long-term, adverse impact on the Upper Glacial Aquifer water balance of approximately 1,133 million gallons per day (MGD). Similarly, the impact on the elevation of the water table in the project area would be expected to be negligible and adverse.

During operation of the project, groundwater could potentially be impacted temporarily during a sewage pipe leak or break. Temporary dewatering may be necessary to reach the pipe for repair. Excavation dewatering for the pipe repair would adhere to BMPs for water management and to all applicable local, state, and federal regulations. None of the drinking water wells would be affected because they are located outside and upgradient of the project area. A sole source aquifer screening has been conducted in accordance with Section 1424(e) of the Safe Drinking Water Act of 1974 with EPA approval and suggestions to minimize environmental impacts dated July 1, 2015 (Appendix E).

Wetlands

Impacts on wetlands are not expected because nearby waterways or wetlands would not be modified under the proposed action. Construction activities would take place within regulated areas adjacent to tidal and freshwater wetlands. As noted above, BMPs would be employed during construction and specified in an Erosion and Sediment Control Plan and SWPPP. Construction activities within areas adjacent to NYSDEC wetlands would be regulated by the NYSDEC Freshwater and Tidal Wetlands Permit Program to ensure that impairment of wetlands functions is avoided or minimized.

This reduction of nitrogen loading, described above, would have a beneficial impact on wetland plants because it would help prevent the deterioration of currently healthy plants and allow already impaired plants with weakened roots to improve. Stronger wetland edges reduce the risk of erosion and slumping, thereby stabilizing the shoreline. The proposed action would have a minor, beneficial effect on wetlands due to the reduced nitrogen loading.

Floodplains

Neither the West Avenue Pump Station nor the AWTF are located in the floodplain; therefore, there would be no impacts on the floodplain at those locations. Most of the proposed sewer collection infrastructure would be located within the floodplain resulting in short-term, minor, adverse impacts by exposing the infrastructure to floodwaters in the chance that a flood would occur during construction. Piping would be installed underground; it would be less susceptible to damage from flooding than OSWS. The development footprint of the proposed action also would not result in an increase in impervious cover because all structures would be located below ground, except the West Avenue Pump Station upgrades, which would be located within the existing development footprint. The size and areal extent of the floodplain would remain the same. Therefore, the capacity of the floodplain within the sewer collection area to store and infiltrate water from both stormwater and tidal surges, reduce flood flows, and recharge to groundwater would not be impacted in the long term.

Healthy wetlands are more effective in attenuating wave energy and accommodating storm surge. Stabilization of the shoreline under Alternative 2 due to increased health of wetlands would provide flood protection for the area from storm events and sea-level rise (NYSDEC 2014b).

Healthy wetland plants further reduce erosion of the wetland edges, thereby increasing the protection to the floodplain.

The sewerage of presently unsewered parcels in Alternative 2 would enable existing populations to remain in the floodplain, resulting in sustained risk from flood hazards. However, this risk would be reduced by the potential flood mitigation benefits of the proposed action, as discussed above. Approximately 10 vacant parcels in the project area are located in the floodplain. As further discussed in Section 5.8, *Land Use and Planning*, the proposed action is not likely to result in induced growth due to existing zoning regulations. Therefore, this Alternative would not likely result in increased development in the floodplain; although, there is the potential for those 10 vacant parcels in the floodplain to develop due to the availability of new sewer infrastructure. See Appendix F for the floodplain 8-step review.

Coastal Resources

Consultation with NYSDOS was completed on January 26, 2016, and concurrence of consistency was received (Appendix C). The proposed action would have a short-term, adverse impact on coastal resources during construction, but the impact would be negligible because previously described BMPs would be followed. It would have potential minor, long-term, beneficial effects on coastal resources because nitrogen and pathogen loading would be reduced, and the health of coastal wetlands would be improved.

Alternative 3: Vacuum Sewer Extension

Water Quality

The impacts and mitigation strategies for Alternative 3 would be similar to the proposed action (Alternative 2). However, because only 338 parcels would be sewerage, Alternative 3 would result in approximately 40 percent less beneficial, long-term, effects on water quality than Alternative 2.

Wetlands

The types of impacts and mitigation strategies for wetlands under Alternative 3 would be similar to Alternative 2, but smaller than those described for the proposed action.

Floodplains

The types of impacts and mitigation strategies for floodplains under Alternative 3 would generally be similar to those described for the proposed action, but would result in less potential benefits from tidal flood mitigation from wetland health and stability. While Alternative 3 would not require on-site LPSGPS at each property or lateral connections to 291 properties, it would require the construction of the central vacuum station, which would result in a minimal increase in impervious surface area resulting in a negligible impact. Alternative 3 also would require larger diameter sewer mains. Relative to the proposed action, installation of the vacuum sewer collection infrastructure would require additional excavation because larger sewer mains would need to be routed from the new vacuum station to the Patchogue AWTF. However, because pipes are installed in the ground, long-term impacts on floodplains are not expected. This alternative is not expected to result in increased development in the floodplain for the same reasons as the proposed action.

Coastal Resources

Alternative 3 would result in impacts on coastal resources similar to, but proportionately smaller beneficial effects than, those described for the proposed action.

5.4 Vegetation

5.4.1 Existing Conditions

The project area is dominated by impervious surfaces within a community that is nearly completely developed with residential, commercial, and industrial properties. There are scattered trees, and properties are landscaped with grass and shrubs. Most of the vegetation in the project area has been planted and contains a mix of native and non-native species. A list of plant species, including native and invasive species, within Suffolk County is included in Appendix H (NYSDEC 2015a).

EO 13112 Invasive Species, as amended, requires federal agencies, to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause to the extent practicable. Invasive species prefer disturbed habitats and generally possess high dispersal abilities, enabling them to out-compete native species.

5.4.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Potential sanitary wastewater overflow from future flood events could potentially damage vegetation within the project area and continue to contribute to degradation of adjacent vegetated wetlands. Within adjacent wetlands, any invasive wetland vegetation already present, would likely continue to spread to vulnerable areas, particularly weakened wetland edges. Therefore, the no-action alternative would have potential minor adverse impacts on vegetation.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Construction would occur within existing development and paved public ROWs. Should any street trees need to be removed during project activities, the Village of Patchogue Code requires a permit from the Village Clerk, and may require that the tree is replaced with an approved species within 12 months after its removal (Village of Patchogue Code Chapter 398: Trees and Shrubs). Therefore, construction of this alternative would have a negligible, short-term, adverse impact on vegetative resources within the project area. However, this alternative would have a minor, long-term, beneficial effect on the health of vegetation in adjacent wetlands by preventing sanitary wastewater overflow during future flood events.

Opportunistic non-native invasive plant species can spread or become established following ground disturbances associated with construction. To limit the spread of such species, construction equipment should be thoroughly cleaned prior to leaving a location. Treatment to remove any invasive species that may become established after construction should be conducted. Any damaged vegetation should be replaced with species resistant to infestation by invasive insects.

Soil erosion could occur during construction of this alternative, potentially affecting vegetation by reducing the seed bank; damaging, killing, or removing germinating plants; and reducing available rooting substrate. Erosion would be minimized through the use of BMPs including soil and erosion control measures that would be employed during construction. These measures would be specified as part of the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity permit application, which would also include an Erosion and Sediment Control Plan and

SWPPP. These measures should protect existing vegetation from any potential damage caused by erosion issues.

Alternative 3: Vacuum Sewer Extension

Impacts from and mitigation for the implementation of Alternative 3 would be similar to the impacts and mitigation for Alternative 2. Therefore, this alternative would result in negligible short-term, adverse impact on vegetative resources within the project area, and a negligible to minor, beneficial effect on vegetation in adjacent wetlands. Alternative 3 would have less potential for beneficial effects on vegetation than Alternative 2 because it would result in the decommissioning of fewer OSWS and smaller reductions in effluent and pollution.

5.5 Wildlife and Fish

The Magnuson – Stevens Fishery Conservation and Management Act (16 USC 1801) promotes the protection, conservation, and enhancement of Essential Fish Habitat (EFH) for those species actively managed under federal Fishery Management Plans (FMPs). EFH includes those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The Magnuson – Stevens Fishery Conservation and Management Act requires all federal agencies to consult with the National Oceanic and Atmospheric Administration Fisheries on all actions or proposed actions that are permitted, funded, or undertaken by the federal agency that may adversely affect designated EFH.

The Migratory Bird Treaty Act of 1918 provides a program for the conservation of migratory birds that fly through lands of the United States. The Migratory Bird Treaty Act makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. The law requires federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any migratory birds or result in the destruction or adverse modification of identified ecosystems of special importance to such species. The Migratory Bird Treaty Reform Act of 2004 includes all species native to the United States or its territories, which are those that occur as a result of natural biological or ecological processes.

As discussed in Section 5.4, *Vegetation*, EO 13112 Invasive Species, applies to wildlife invasive species and care will need to be used to prevent the spreading or introduction of these species.

5.5.1 Existing Conditions

Wildlife, such as raccoons, skunks, chipmunks, squirrels, sparrows, rabbits, and passerine birds, may use the existing habitat of maintained lawns, open space, and scattered trees and shrub areas within the project study area. It is anticipated that passerine birds and small mammals may be present within the project area, but because the project area is so densely developed, it does not support quality foraging, nesting, or shelter for wildlife or fish species.

Surface waters of the Patchogue River and Tuthills Creek drain into Patchogue Bay and Great South Bay, which is the largest protected shallow, coastal bay area in New York State. This expansive body of water is highly productive and supports a tremendous diversity of fish and

wildlife species. The mixing water/brackish salinity zone of Great South Bay (which would include the Patchogue River and Tuthills Creek) is designated as EFH for various life stages of federally managed finfish species, including bluefish (*Pomatomus saltatrix*), summer flounder (*Paralichthys dentatus*), winter flounder (*Pseudopleuronectes americanus*), and windowpane flounder (*Scopthalmus aquosus*). This designation includes EFH for juvenile and adult summer flounder. Adjacent areas of Patchogue Bay have been mapped by the National Wetlands Inventory as subtidal aquatic beds. Aquatic beds within juvenile and adult summer flounder EFH are Habitat Areas of Particular Concern. While EFH has not been designated for many forage species, impacts on these species can affect habitat for EFH-designated species that rely on them as a food source. Forage species likely to occur in the Patchogue River and Tuthills Creek include mummichog (*Fundulus heteroclitus*), striped killifish (*Fundulus majalis*), sheepshead minnow (*Cyprinodon variegatus*), Atlantic silversides (*Menidia menidia*), and grass shrimp (*Palaemonetes* spp.).

A diversity of other ecologically and recreationally significant fish likely also occur in the tributaries to Patchogue Bay on a seasonal basis. Shellfish such as oysters and hard clams likely occur within the Patchogue River and Tuthills Creek; however, these waters are classified as uncertified for shellfishing by NYSDEC due to their unsanitary condition.

The project area is located within the North America Atlantic Flyway for migratory birds. Several species of migratory birds, including the federally listed threatened piping plover and the endangered roseate tern (see Section 5.6 *Threatened and Endangered Species and Critical Habitat*), use the wetlands and coastal habitats of the South Shore Estuary Reserve for stop-over feedings on their way to breeding grounds or as breeding grounds themselves. Additional species of migratory birds that may use the project area include sparrows, warblers, blackbirds, finches, robins, and wrens. Wading birds (herons/egrets), waterfowl, and shorebird species may use West Lake and Tuthills Creek for foraging habitat. Due to the presence of dense development, human activity, and the dominance of landscape vegetation, the project area does not support quality foraging or nesting habitat for migratory birds; however, the existing vegetation, including trees, can still be used for nesting and foraging.

Currently there are no known infestations of the invasive insect emerald ash borer (*Agrilus planipennis*) on Long Island; however, Asian longhorn beetle (*Anoplophora glabripennis*) is present in some areas.

5.5.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the no-action alternative, there would be no construction impacts on wildlife and fish. The alternative would not reduce the risk of impacts on aquatic animal species from sewage overflows into waterways during future flood events. Impacts of untreated sewage releases on fish and wildlife species could range from stress on species, degradation of food sources, destruction of breeding grounds, and physical harm. The potential degradation of tidal wetlands and adjacent shallow waters described above (Section 5.3.2) would adversely affect vital foraging and nesting habitat for numerous shorebird and wading bird species, shellfish populations, and impact functions as a nursery for larval and juvenile fish. EFH for designated species and their forage species in area waters would continue to be degraded by ongoing water quality impairments resulting from sewage releases under the no-action alternative, limiting use by these species,

resulting in a continued moderate adverse effect to EFH. Shellfish habitat would also continue to be adversely affected by water quality impairments, depressing shellfish abundance and diversity. Overall, the no-action alternative would result in moderate, long-term, adverse impacts.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Adverse impacts on wildlife and fish are expected to be minor as a result of construction of the proposed action. Minimal tree removal along street corridors may be required as part of this alternative, but it is unlikely to significantly affect migratory bird species because these trees do not provide high quality nesting habitat due to their proximity to human disturbance. Removing trees outside of the breeding season will limit the impacts on migratory bird species.

Because the project area is nearly completely developed, it does not support quality habitat for wildlife or fish species. The proposed action may cause temporary disturbance to wildlife from noise and activity during construction.

High quality surface water is necessary for the healthy reproduction and growth of shellfish. Once the sewer extension is operational, fish and shellfish habitat, including EFH for designated species and their forage species, would experience beneficial effects over the long term under this alternative, as the frequency and magnitude of sewage releases would be greatly reduced compared to current conditions. Hypoxic conditions and algal blooms, which can cause fish kills and abandonment of areas of poor water quality, would be less frequent. Fish, benthic invertebrates, and waterfowl that use the Patchogue River and its tributaries, and Patchogue Bay, would benefit from water quality improvements and positive changes to the benthic environment that may result from project implementation (as described in Section 5.3.2). Improved water quality would increase ecosystem health by stabilizing and even allowing tidal wetlands to expand, which would promote growth of shellfish and marine life within the South Shore Estuary.

Construction should have no effect on the spread of invasive insect species as long as BMPs required by USDA and NYS Department of Agriculture and Markets are in place. Those working on-site should be aware of the possibility that these insects may be present and promptly report anything suspicious to NYSDEC or the NYS Department of Agriculture and Markets. Any trees that may need to be replaced as a result of the project should be tree species that are resistant to these invasive insects.

Overall, Alternative 2 would have negligible, short-term, adverse impacts on wildlife and fish within the project area during construction, but operation could potentially have a minor to moderate positive impact to nearby wildlife and fish habitat as a result of reduced pollution in adjacent waterways.

Alternative 3: Vacuum Sewer Extension

Impacts from Alternative 3 would be similar to those described for Alternative 2. Therefore, Alternative 3 would have a negligible, local, short-term, adverse impact on fish and wildlife within the project area during construction, but operation could potentially benefit wildlife and fish in nearby aquatic habitats, including EFH for designated species and their forage species, due to reduced nitrogen and pathogens in the effluent. However, Alternative 3 would have less potential for beneficial effects on wildlife and fish habitat than Alternative 2 because it would decommission fewer OSWS and result in a smaller reduction in pollution.

5.6 Threatened and Endangered Species and Critical Habitat

Section 7 of the Endangered Species Act of 1973 (16 USC 1536 [2010]) requires federal agencies to determine whether the projects that they propose to undertake or fund have any potential to affect species listed or proposed for listing as threatened or endangered or their designated critical habitat. The law also prohibits any action that causes a “taking” of any listed species. To “take” means to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Critical habitat is a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. No critical habitat is designated in the project area.

Haliaeetus leucocephalus (bald eagles) were removed from the federal list of threatened and endangered species on August 9, 2007, and are no longer protected under the Endangered Species Act. However, bald eagles are still federally protected under the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the Lacey Act. Bald eagles are still listed as a threatened species by New York State.

5.6.1 Existing Conditions

Threatened and Endangered Species

A search of the USFWS New York Field Office’s ECOS-IPaC website for information regarding the potential presence of species under jurisdiction of the USFWS within the project area was conducted. The official list of federally threatened and endangered species and candidate species known or likely to occur in the project area is provided in Appendix H. This list indicates that two listed plant species have been documented in the project area: sandplain gerardia (*Agalinis acuta* – endangered) and seabeach amaranth (*Amaranthus pumilus* – threatened). However, based on these species’ habitat requirements, neither is expected to occur within the project area. This list also indicates that the following wildlife species have been documented in the vicinity of the project area: piping plover (*Charadrius melodus* – threatened), red knot (*Calidris canutus rufa* – threatened), roseate tern (*Sterna dougallii* – endangered), and northern long-eared bat (*Myotis septentrionalis* – threatened). These species may be present within the vicinity of the project area; however, based on their habitat requirements, there is no suitable habitat within the project area. These habitat requirements include:

- Red Knot: mudflats with abundant food such as horseshoe crab eggs.
- Piping Plover: wide, flat, open, sandy beaches with limited vegetation and limited human disturbance.
- Roseate Tern: open water for fishing and barrier island nesting colony areas free of predators and human disturbance.
- Northern Long-eared Bat: abundant stands of trees with sufficient bark crevices and snags for roosting.

According to the NYSDEC Environmental Resource Mapper, there are no rare plants or significant natural communities within the project area. The NYSDEC Natural Heritage Program (NHP) was also contacted to request information on any known occurrences of federal or state endangered, threatened, proposed, or candidate species of flora and fauna or any critical habitats known to support those species within the vicinity of the project area. Correspondence received from the NYSDEC NHP indicates that there are no records of rare or state-listed plants or animals, or critical

habitats known to support such species, or significant natural communities within the project area or in its immediate vicinity. NYSDEC NHP correspondence is provided in Appendix I.

NYSDEC NHP indicated that there are no records of nesting bald eagles within the project area. Additionally, there are no bald eagle breeding territories within the vicinity of the project area according to the NYSDEC Conservation Plan for Bald Eagles in New York State (NYSDEC 2015b).

5.6.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the no-action alternative, potential nearby habitat for threatened and endangered species would continue to be at risk of degradation from sewage overflows into nearby waterways during future flood events. Threatened or endangered species, such as piping plover, red knot, and roseate tern, while not found within the project area, may use the coastal waters, wetlands, and beaches of Patchogue Bay and Great South Bay for foraging or breeding and could be affected by sewage that is discharged into the Patchogue River and flows into these tidal waterways. Therefore, the no-action alternative would have minor, adverse impacts on nearby potential habitat for protected species.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

The project area does not support habitat for threatened and endangered species; therefore, construction of Alternative 2 would have no effect on threatened and endangered species because construction effects would be localized to the immediate vicinity of the construction activities. Operation of Alternative 2 would improve the quality of adjacent waters, which could potentially improve adjacent habitats that may be used by threatened and endangered species.

Alternative 3: Vacuum Sewer Extension

Impacts from Alternative 3 would be similar to those described under Alternative 2. Therefore, construction of Alternative 3 would have no impact on threatened and endangered species. Operation of Alternative 3 could potentially improve adjacent habitats that may support threatened and endangered species as a result of reduced pollution. However, Alternative 3 would have less potential for beneficial effects on threatened and endangered species than Alternative 2 because it would decommission fewer OSWS and result in a smaller reduction in pollution.

5.7 Cultural Resources

As a federal agency, FEMA must consider the potential effects of any of its funded actions (i.e., undertakings) on historic properties prior to engaging in any undertaking and provide the Advisory Council of Historic Preservation (ACHP) a reasonable opportunity to comment if there would be an adverse effect. This obligation is defined by Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended and implemented by 36 CFR Part 800. Cultural resources are defined as prehistoric or historic archaeology sites, historic standing structures, historic districts, objects, artifacts, cultural properties of historic or traditional significance, referred to as Traditional Cultural Properties (TCPs) that may have religious or cultural significance to Federally-Recognized Indian Tribes (Tribes), or any other physical evidence of human activity considered

important to a culture, subculture, or community for scientific, traditional, religious, or other reasons.

Cultural resources listed, eligible for listing, or potentially eligible for listing, on the National Register of Historic Places (NRHP) are subject to protection from adverse impacts resulting from an undertaking. To be considered significant, a cultural resource must meet one or more of the criteria established by the National Park Service that would make that resource eligible for inclusion in the NRHP. Eligibility criteria for listing a property in the NRHP are detailed in 36 CFR Part 60. Sites not yet evaluated may be considered potentially eligible for inclusion in the NRHP and are afforded the same regulatory consideration as nominated properties. The New York State Historic Preservation Office (SHPO) within the Office of Parks, Recreation and Historic Preservation (OPRHP) maintains a list of New York's historic properties.

Pursuant to 36 CFR 800.4(a)(1), the Area of Potential Effects (APE) is defined as the geographic area(s) within which the undertaking may directly or indirectly affect cultural resources. Within the APE, impacts on cultural resources are evaluated for both historic structures (above-ground cultural resources) and archaeology (below-ground cultural resources). A Phase IA cultural resource reconnaissance survey was completed for the project (Appendix G). The Phase IA survey assessed the entire project area for archaeological impact and architectural significance, and particular attention was focused on areas with map-documented historic structures (MDS) identified during the background research.

5.7.1 Existing Conditions

Archaeology

Research conducted using NYSHPO Cultural Resource Information System (CRIS) revealed the project area is located in an archaeologically sensitive area, and three previously recorded archaeological sites are located within one mile of the Area of Potential Effect (APE). Two of the archaeological sites are listed as Undetermined historic sites and the third site is an Undetermined prehistoric site described as being an isolate or stray find. There are five additional archaeology sites if the buffer for the APE is extended to 10,560 feet (two miles), two Undetermined historic sites, one Undetermined prehistoric site (Swan Bluff Site, NYSM 12300), and two unknown Undetermined archaeology sites. Given the presence of prehistoric and historic sites recorded in the vicinity of the project area, the potential to encounter other such sites located within the APE was considered to be high.

Although the project area is located within an archaeologically sensitive area with the potential to yield historic and prehistoric archaeological resources; the majority of the APE consists of modern and commercial development that has significantly modified the area and disturbed the soil making it less likely to preserve and/or contain significant in-situ historic and/or prehistoric archaeological deposits. Most of the project area is comprised of mid- to late-20th century and early-21st century residential and commercial development. River Avenue, the western boundary for the project area, is composed of mid- to late-20th century housing, large apartment complexes, commercial lots, a marina, and cleared, vacant lots being readied for commercial or residential development. This mixed-use, suburban sprawl, continues into the project area's northern boundary, along the Long Island Railroad and Division Street. The eastern boundary of the APE reveals a mix of mid- and late-20th century residences and commercial development and the southern boundary contains a

park, a commercialized marina, in addition to late-20th century housing. Because of this, the potential to encounter in-situ archaeological resource within these location is considered low.

Portions of the project area where map-documented structures (MDS) have been identified are considered to have moderate to high sensitivity for encountering archaeological resources. These include areas along South Ocean Avenue, Furman Lane, Railroad Avenue, and River Avenue (and its associated side streets). The earliest known map of the region is the Damerum map (1815) and it shows some development in Patchogue, primarily along Montauk Highway (Main Street), 1,580 feet north of the project site, and at Blue Point, which is located 3,700 feet west of the project area. Areas of archaeological sensitivity for the potential to encounter archaeological deposits were also based on structures depicted on the 1873 F.W. Beers Atlas of Long Island. A review of the 1873 Suffolk County Business Notices reveals the majority of Patchogue businesses were located along Main Street (Montauk Highway). Occupations ranged from attorney, carpenter and builder, hotelier, “druggist” or pharmacist, to miscellaneous merchants and dealers, which included blacksmith, furniture dealer, and grocer.

A Phase IA cultural resource reconnaissance survey conducted by Louis Berger Group (LBG 2015, Appendix G) revealed a considerable portion of the overall project area appears to be disturbed and significantly modified by modern development which is further explained by the types of soils located within the APE. More than 80 percent of the soils in the project area consist of urban land (Ur), cut and filled land (CuB), made land (Ma), or filled land from dredged materials (Fd) (LBG 2015). However, patches of undisturbed, or intact, soils have been identified in the APE and within these areas, four distinct soil series have been mapped. Berryland mucky sand (Bd) is mapped in small areas, approximately 1 percent of the project area, along the edge of the Patchogue River. This particular type of soil is considered to be generally very deep, very poorly drained, and found in coastal plain upland or lowland environments and are often found in areas adjacent to swamps and in bottoms of closed depressions at levels just above the tidal mark (LBG 2015). Areas of Carver and Plymouth sands (CpA) with 0 to 3 percent slopes are found in fairly isolated portions to the east and west of the Patchogue River. Combined, these soils comprise roughly 12 percent of the APE and are characterized as very deep, excessively drained soils formed in glaciofluvial deposits (LBG 2015). They are nearly level through steep soils on plains and moraines. Deerfield sand (De) was mapped in the southeast portion of the project area, covering less than 2 percent of the total survey area. Though not quite as well drained as Carver and Plymouth soils, Deerfield soils also consist of very deep soils formed in glaciofluvial deposits and are often formed on terraces, deltas, and outwash plains (LBG 2015). The majority of the project area is a combination of modern (mid-20th century and later) residential and commercial development. Commercial development is concentrated along the edges of the Patchogue River and Patchogue Bay and consists primarily of marinas and restaurants. The soils mapped within the APE indicate the Patchogue landform was continually filled-in with soil to accommodate an expanding population and that significant earth moving and landscape modification complemented a great portion of this development as prior marsh lands were filled and stabilized in order to facilitate construction.

Although the project area is located within an archaeologically sensitive area with the potential to yield historic and prehistoric archaeological resources; the majority of the APE consists of modern and commercial development that has significantly modified the area and disturbed the soil making it less likely to preserve and/or contain significant historic and/or prehistoric archaeological deposits, therefore, it is no longer considered archaeologically sensitive.

Historic Properties

Research conducted using NYSHPO Cultural Resource Information System (CRIS) revealed the project area is located within 2,640 feet of five National Register-Listed buildings and one National Register-Eligible building. One National Register-Eligible building is located within 5,280 feet of the APE. Within the APE, six National Register-Eligible buildings are located along the west bank of the Patchogue River and near the east bank of the Tuthills Creek. Most of these buildings have been altered and modified with the use of replacement materials and additions. The project is not situated within a designated National Register-Listed or National Register-Eligible historic district, nor is it located within a state or locally recognized historic district.

Large portions of the APE are built out with modern commercial and residential development, particularly along the Patchogue River. As noted above, most of the residential and commercial development in the project area appears to have occurred in the mid-to-late-20th century. The majority of the project area appears characteristic of mid-to-late-20th century suburban residential development with a highly commercialized riverfront setting. Historic architectural styles that are represented in small portions of the APE, include a mixture of vernacular interpretations of popular national architectural styles such as Queen Anne, Colonial Revival, and Craftsman. Many of these historic standing structures have been altered with the use of replacement vinyl siding and vinyl sash windows, and have been modified with entry porch enclosures and rear additions. Several buildings within the APE have also been elevated as a result of Hurricane Sandy. No historic road surfaces, such as brick and cobble stone pavers, were encountered during the reconnaissance survey.

The project area is not situated within a designated National Register-Listed or National Register-Eligible historic district, nor is it located within a state or locally recognized historic district. Given the general lack of National Register-Listed and Eligible above ground resources recorded within the APE and in the vicinity of the APE, and since the majority of the project area is comprised of modern commercial and residential development and altered historic standing structures; the project has no potential to affect National Register-eligible and/or listed architectural resources.

5.7.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The no-action alternative would have no impact on cultural resources because there would be no soil disturbance conducted that could potentially affect archaeological resources and no alterations would be made to potential historic landscaping features or other historic materials of National Register-Eligible or potentially eligible above ground resources. A lack of action to improve the OSWS could result in adverse effects to historic properties that are flooded due to rising groundwater elevations and septic or cesspool failures during natural disasters. These events can be damaging as both single events and multiple events that can cause cumulative damage.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Under Alternative 2, construction of sewer laterals would use a Ditch Witch or small bucket with the disturbance confined within a 1.5-foot trench. Most of the ground-disturbing impacts for this alternative would be limited to the existing sewer ROW under roadways. However, the installation of service laterals, house connections, and LPSGPS would require ground disturbance outside of the ROW.

Some portions of the project area are considered to have archaeological sensitivity based on the probability of encountering intact soils in addition to having sensitivity for the presence of cultural resources. The proximity to marine resources and its location along the Patchogue River, combined with known prehistoric activity within the vicinity of the project area, also support prehistoric sensitivity for undisturbed portions of the project area. In consultation with the SHPO (Appendix D), given the construction methods discussed above with disturbance confined to a 1.5-foot trench, additional archaeological testing would be necessary only under the following conditions for ground disturbance outside the ROW: if ground-disturbing activities were to occur through a known archaeological site or through areas of known early European occupation (18th century or earlier).

Alternative 2 has the potential to impact the setting of historic properties by diminishing the integrity of significant landscape features such as fences and plantings through ground disturbance associated with service laterals or on-site LPSGPS. The precise location of these ground-disturbing activities is unknown. If adverse effects are identified during the preliminary design phase, the effect can be avoided through relocation of the lateral or on-site LPSGPS or restoration of the landscape feature to pre-construction conditions upon completion of construction. The final design would be reviewed by the SHPO for concurrence before the project proceeds. If adverse effects cannot be avoided, they will be mitigated in consultation with the SHPO. Such mitigation measures might include a full reconnaissance survey of the APE that would be conducted upon completion of final design and prior to construction.

As noted above, although the project area is located within an archaeologically sensitive area, there is limited potential to encounter in-situ prehistoric or historic archaeological resources due to the amount of soil disturbance within the APE as the highly developed portions are not likely to contain intact historic or prehistoric archaeological deposits and are not considered archaeologically sensitive. The construction contractor would be required to prepare and implement a plan for unanticipated discoveries.

Alternative 3: Vacuum Sewer Extension

Alternative 3 would not require the installation of on-site LPSGPS. The receiving pits would be located within the existing roadways, and this alternative would sewer fewer parcels. However, the need for larger diameter service laterals would exceed the 1.5-foot trench limitation required to minimize ground disturbance; a Phase IB archaeological survey would then be necessitated. This alternative would also entail the construction of a new central vacuum station, which would result in additional ground disturbance and would need a Phase IB archaeological survey to be completed. For similar reasons, a Phase IB archaeological survey would also need to be conducted for parcels that need new service laterals installed, where trenches exceed the 1.5-foot trench limitation, within areas deemed archaeologically sensitive (Appendix G). Should potential impacts be identified by the Phase IB archaeological survey, appropriate mitigation measures and associated procedures would be recommended. Similar to Alternative 2, this alternative has the potential to impact the setting of historic properties by diminishing the integrity of significant landscape features such as fences and plantings through ground disturbance. If potential adverse effects are identified, appropriate avoidance and mitigation measures would be developed in consultation with the SHPO, as discussed under Alternative 2.

5.8 Land Use and Planning

5.8.1 Existing Conditions

Existing land uses in the project area are a mix of residential, industrial, commercial, recreational, and institutional. Community facilities are another predominant feature throughout the project area. The current use of the majority of the land within the project area is residential. Along the Patchogue River waterfront and Main Street, the predominant land uses are commercial and industrial. The Patchogue River waterfront has a mix of residential, maritime, commercial, recreational, and industrial uses, and a few vacant sites (Appendix A, Figure 11).

Parcels included in the expanded service area are residential (low, medium, and high density), commercial, industrial, and vacant, with commercial and industrial properties concentrated primarily along the Patchogue River, Patchogue Bay, and Tuthills Creek as well as along the low-pressure sewer main extension on Waverly Avenue that services the Northwood Townhouse property (Appendix A, Figure 11). The existing land use figure presents all land uses within the project area.

The zoning boundaries of the village were established in 1953 and last amended in 1998. According to the 1998 revision, the project area contains a mix of residential, commercial, and industrial zoning districts, including Residence District A, Business District D-1, Business District D-2, Business District D-5, and Industrial District E.

The analysis of impacts on land use and zoning also considers whether or not the proposed action is consistent with the public policy and short- and long-term land use plans for the area. The *Suffolk County Comprehensive Master Plan, Framework for The Future*, prepared in 2014, recommends supporting existing communities with ample funding for infrastructure. The plan states “the County has many thriving communities that should be supported through infrastructure investments and incentives that encourage additional housing options...Funding needs to be targeted toward existing communities, for multi-family transit oriented development, expanded wastewater infrastructure, and land recycling to support community revitalization and increase resiliency.” A priority action of the comprehensive master plan is to “continue coordination between *New York Rising* and the County.” Another priority action area within the plan is to “Build for Resiliency” with actions, including identifying locations for wastewater upgrades and locations for new water/sewer infrastructure.

5.8.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The no-action alternative would not change existing land use or zoning in the project area. However, the no-action alternative is inconsistent with the goals of the *Suffolk County Comprehensive Master Plan* to provide infrastructure to existing communities and mitigate further degradation of the area’s natural resources. Under the no-action alternative, there would be no progress towards these priority actions, resulting in minor, adverse impacts.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Implementation of Alternative 2 would not directly change the function or land use of the parcels in the project area; however, the addition of new infrastructure can often indirectly lead to future

land use controls allowing for compact mixed use development. The potential for redevelopment and residential or business displacement would be limited by existing zoning regulations in the project area. No zoning changes or redevelopment plans are proposed as part of this proposed action. Any future changes in zoning would be subject to separate environmental review.

The project area for the proposed action contains 12 parcels that are vacant. While the exact 648 parcels to be serviced by the proposed out-of-district connections would be determined during engineering design, the proposed action may result in minimal induced growth related to the development of these 12 parcels that could be provided with sewer service if they are determined to be included during project design. Based on existing zoning, five of these parcels are zoned as single-family residential (Residence A), with one parcel zoned as multi-family residential (Residence C). Therefore, providing sewer service may result in the development of five single-family homes and one owner-occupied two-family dwelling, garden apartments, apartment house or multi-family dwellings (Village of Patchogue Zoning Code, Section 435-17). Five parcels are zoned as commercial, and one is zoned as industrial within both project areas. Commercial uses that are permitted in these districts generally include personal service shops, certain indoor recreational uses (by special permit), hotels and motels, telephone exchanges, retail stores, restaurants and wholesale stores (by special permit), offices and professional buildings, and undertaking establishments (Village of Patchogue Zoning Code, Section 435-23).

The proposed action would not result in direct impacts on land use or zoning in the project area, but could result in minor, indirect, long-term impacts from potential increased development in the vacant lots. The purpose of the proposed action is consistent with the goals of the *Suffolk County Comprehensive Master Plan* to provide infrastructure to existing communities and mitigate further degradation of the area's natural resources.

Alternative 3: Vacuum Sewer Extension

Similar to the proposed action, Alternative 3 would not directly change the function or land use of most parcels in the project area, but it would change the land use of the parcel where the central vacuum station would be located. Given that the location for the central vacuum station is yet to be finalized, the determination of consistency with current zoning cannot be made; it is likely that the zoning for that particular parcel would need to change to accommodate the siting of the station. The implementation of Alternative 3 would not result in direct impacts on land use or zoning in the project area. Like Alternative 2, the potential for redevelopment and residential or business displacement would be limited by existing zoning regulations in the project area, but could result in minor, indirect, long-term impacts from potential increased development in the vacant lots. As Alternative 3 would sewer fewer parcels than Alternative 2, such impacts are anticipated to be slightly less for this alternative. Alternative 3 would be consistent with the goals of the *Suffolk County Comprehensive Master Plan* to provide infrastructure to existing communities and mitigate further degradation of the area's natural resources. Like Alternative 2, this alternative may result in minimal induced growth related to the development of the 12 vacant parcels in the project area that could be provided with sewer service if they are determined to be included during project design. However, these impacts would be minor due to existing zoning regulations.

5.9 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal agencies to ensure that programs, policies, and activities do

not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations. This order also requires that federal agencies ensure public notification of environmental issues is concise, understandable, and readily accessible.

In 1997, CEQ published a guidance document on environmental justice for federal agencies entitled *Environmental Justice Guidance under the National Environmental Policy Act*. In addition, all federal agencies were directed under EO 12898 to establish internal directives to ensure that the spirit of the executive order was reflected in the full range of their activities.

5.9.1 Existing Conditions

Any potential adverse impacts or benefits on the surrounding community are expected to occur within a 0.5-mile radius of the proposed action. Therefore, the study area for the environmental justice analysis was defined as those census block groups that are at least 50 percent within a 0.5-mile radius from the proposed action. The environmental justice study area includes a total of nine block groups (Appendix A, Figure 12).

A race, ethnicity, and poverty status profile for the environmental justice study area and for Suffolk County was compiled using data from the 2009–2013 American Community Survey from the U.S. Census Bureau (U.S. Census Bureau 2014) (see Table 5).

Minority Communities

As defined by the Environmental Justice Guidance Under NEPA (CEQ 1997), “minority populations” include persons who identify themselves as Asian or Pacific Islander, Native American or Alaskan Native, Black (not of Hispanic origin), or Hispanic. Race refers to census respondents’ self-identification of racial background. Hispanic origin refers to ethnicity and language, not race, and may include persons whose heritage is Puerto Rican, Cuban, Mexican, and Central or South American.

CEQ guidance requires minority communities to be identified where the minority population exceeds 50 percent, or where the minority population percentage is meaningfully greater than the minority population in the reference area. In Suffolk County, the reference area for the proposed action, the minority population makes up 28.9 percent of the total population. Therefore, this analysis considers any study area block group with a minority population of 28.9 percent or more to be a minority community.

Based on the criteria above, seven environmental justice study area block groups are considered minority communities (Appendix A, Figure 12).

Low-Income Communities

In Suffolk County, the population in poverty, defined as percent of the population living below the federal poverty level, accounted for 6.4 percent of the total population. This analysis defines any study area block group with more than 6.4 percent of population living below the poverty level to be a low-income community.

Applying the population in poverty threshold defined above, seven environmental justice study area block groups are considered low-income communities of concern. The environmental justice study area as a whole is also considered a low-income community because 13.8 percent of its population has an income below the poverty level.

Table 5. Study Area Demographic Profile

Demographic	Suffolk County	Study area	Census Tract 1589.00, Block Group 1	Census Tract 1589.00, Block Group 2	Census Tract 1589.00, Block Group 3	Census Tract 1589.00, Block Group 4	Census Tract 1589.00, Block Group 5	Census Tract 1590.00, Block Group 1	Census Tract 1590.00, Block Group 2	Census Tract 1590.00, Block Group 3	Census Tract 1592.01, Block Group 2
White alone	71.0%	62.4%	48.2%	27.7%	76.5%	82.4%	88.6%	59.2%	70.7%	63.0%	57.3%
Black or African American alone	7.1%	7.6%	6.8%	9.6%	14.5%	6.6%	4.3%	5.4%	8.0%	20.6%	1.2%
American Indian and Alaska Native alone	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Asian alone	3.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.6%
Native Hawaiian and Other Pacific Islander alone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Some other race alone	0.2%	0.2%	2.4%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Two or more races	1.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	1.1%	0.0%	0.0%
Hispanic or Latino	16.9%	29.3%	42.6%	62.7%	9.0%	11.0%	5.9%	35.5%	20.1%	16.4%	40.9%
Total Minority Population	28.9%	37.6%	51.8%	72.3%	23.5%	17.6%	11.4%	40.8%	29.3%	37.0%	42.7%
Total Population	1,495,803	13,950	1,129	1,970	1,026	625	2,359	2,074	1,505	1,214	2,048
Population with Income below Poverty Level	6.4%	13.8%	29.5%	32.5%	14.5%	17.9%	7.2%	9.8%	3.4%	19.2%	1.6%

Source: U.S. Census Bureau 2014

5.9.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the no-action alternative, no additional sewer infrastructure would be constructed, and there would be no short-term, adverse impacts related to construction activities. Use of existing OSWS would continue, and environmental justice communities would subsequently continue to be at a relatively increased risk of socioeconomic costs associated with the failure of these systems, including paying for the associated costs of clean-up of contaminants in homes and yards and damage to property. In the absence of the out-of-district sewer extension, the environmental justice communities in the study area would not benefit from improved water quality, increased flood attenuation, and improved coastal resiliency.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

No significant adverse effects have been identified for the proposed action. Construction of the proposed action would create minor, short-term, adverse impacts in the environmental justice area, including traffic impacts associated with construction activity. These impacts would be mitigated by implementation of a traffic management plan and project-specific provisions that would require that police and emergency service providers be given adequate advance notice of any street closures and detours. These effects would burden the study area in general and would not be disproportionately high or adverse for minority or low-income populations.

Overall, the proposed action would have substantial beneficial effects on the currently unsewered properties that would be connected to the municipal sewer system via the sewer extension, as well as the balance of the environmental justice study area. Currently occupied out-of-district properties that would be connected to the municipal sewer system would benefit from the elimination of sewage backups and potential septic system failure and the associated cost of clean-up of contaminants in homes, yards, and properties. Beneficial effects of improved coastal resiliency could also include mitigating any potential impacts on property values associated with recurring flooding (Suffolk County 2015a).

Alternative 3: Vacuum Sewer Extension

Similar to the proposed action, Alternative 3 would result in minor, short-term, adverse traffic impacts during construction, which would be mitigated as described above. These short-term impacts would not result in disproportionately high and adverse impacts on minority and low-income populations. Similar to the proposed action, this alternative would also have beneficial effects on the currently unsewered properties that would be connected to the municipal sewer system via the sewer extension, as well as the balance of the environmental justice study area.

5.10 Noise

The Noise Control Act of 1972 required EPA to create a set of noise criteria. In response, EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* in 1974, which explains the impact of noise on humans. The EPA report found that keeping the maximum 24-hour Ldn value below 70 dBA would protect the majority of people from hearing loss. EPA recommends an outdoor Ldn of 55 dBA. According to published lists of noise sources, sound levels, and their effects, sound causes pain starting at

approximately 120 to 125 dBA (depending on the individual) and can cause immediate, irreparable damage at 140 dBA. The Occupational Safety and Health Administration (OSHA) has adopted a standard of 140 dBA for maximum impulse noise exposure.

Sound pressure level (SPL) is used to measure the magnitude of sound and is expressed in decibels (dB or dBA), with the threshold of human hearing defined as 0 dBA. SPL increases logarithmically, so that when the intensity of a sound is increased by a factor of 10, its SPL rises by 10 dB, while a 100-fold increase in the intensity of a sound increases the SPL by 20 dBA. Equivalent noise level (Leq) is the average of sound energy over time, so that one sound occurring for two minutes would have the same Leq of a sound twice as loud occurring for one minute. The day night noise level (Ldn) is based on the Leq, and is used to measure the average sound impacts for the purpose of guidance for compatible land use. It weighs the impact of sound as it is perceived at night against the impact of the same sound heard during the day. This is done by adding 10 dBA to all noise levels measured between 10:00 p.m. and 7:00 a.m. For instance, the sound of a car on a rural highway may have an SPL of 50 dBA when *measured* from the front porch of a house. If the measurement were taken at night, a value of 60 dBA would be recorded and incorporated into the 24-hour Ldn.

Leq and Ldn are useful measures when used to determine levels of constant or regular sounds (such as road traffic or noise from a ventilation system). However, neither represents the sound level as it is perceived during discrete events, such as fire sirens and other impulse noises. Leq and Ldn are averages that express the equivalent SPL over a given period of time. Because the decibel scale is logarithmic, louder sounds (higher SPL) are weighted more heavily; however, loud, infrequent noises (such as fire sirens) with short durations would not significantly increase Leq or Ldn over the course of a day.

5.10.1 Existing Conditions

Noise sources in the project area include traffic and noise typical of urban environments, including landscaping equipment, commercial and industrial activity, construction equipment, and emergency vehicles. Ambient noise levels vary across the project area depending on the nature of the land use. Commercial and industrial areas, as well as areas near heavily traveled roads, have higher noise levels than residential areas on tree-lined streets.

5.10.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

The no-action alternative would not involve construction; therefore, there would be no short-term impacts from noise. Because the no-action alternative would continue to result in potential failures and backups, there could be minor, long-term, adverse impacts from noise generated by pumps and other clean-up/repair activities.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

During construction, the proposed action would generate noise during excavation of trenches, installation and refilling of trenches, and repaving affected roadways. Construction of the proposed action would require construction equipment, including small power tools and hand tools, jackhammers to break pavement, excavators or backhoes to dig the trenches, small cranes or backhoes to lower piping into the trench, trucks with back up warning sounds, and other power

tools, as well as paving machines and trucks to repave the roadway. Noise generated at any one location along the proposed alignment would be short term and localized. Trenching activities would be followed closely by pipe installation, refill, and repaving. In a worst case scenario, in areas along the alignment with residential land uses located approximately 20 feet from the street, noise levels during pavement breaking and trenching could be expected to reach approximately 91 dBA (FHWA 2015). Installation of the pipe is expected to generate lower noise levels, and noise levels during repaving the street, using a paver and a dump truck, would be expected to reach approximately 85.3 dBA (FHWA 2015). Construction activities within 200 feet of noise-sensitive receptors shall be avoided to the extent practicable

Post construction, the flow in any installed sewer lines would be totally silent. The LPSGPS mains are not expected to increase noise levels because the units would be buried. There may be a small amount of noise associated with the operation of the pump station and increased noise as a result of the additional flow to the wastewater treatment facility. This potential increased noise would be localized in the areas of the pump stations and the AWTF.

Contractors for the proposed action would be required to comply with the Village of Patchogue Noise Code. As such, construction would occur between the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday, excluding legal holidays.

Therefore, implementation of Alternative 2 would result in minor, localized, short- and long-term, adverse impacts that would be in compliance with local noise ordinances.

Alternative 3: Vacuum Sewer Extension

Similar to the proposed action, contractors for the proposed action would be required to comply with the Village of Patchogue Noise Code. Construction would occur between the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday, excluding legal holidays. Noise impacts from the implementation of Alternative 3 would be similar to those described for the proposed action, but would result in additional noise from the construction of a new central vacuum station. The central vacuum station and the West Avenue Pump Station would likely be located underground or within an above-ground structure. Noise generated by these facilities would be attenuated by an enclosure to levels permitted by the local noise code (Village of Patchogue 2009). Post construction, noise impacts would be minor. Implementation of Alternative 3 would result in minor, short- and long-term, adverse impacts that would be in compliance with local noise ordinances.

5.11 Transportation

5.11.1 Existing Conditions

The project area is served by local roads and does not contain any primary arterial roads as classified by the New York State Department of Transportation functional classification system. However, Sunrise Highway is located less than 0.5-mile north of the project area and likely would be used for transportation by construction vehicles. Minor arterials within the project area include Waverly Avenue, River Avenue, West Avenue, South Ocean Avenue, and Weeks Street. Commercial and industrial properties in the project area are primarily located on these minor arterials, which have higher existing traffic volumes relative to collector streets (i.e., Division Street) and other local streets (i.e., Brightwood Street, Amity Street, Laurel Street) in the project area.

One designated bicycle route, the Town of Brookhaven-Blue Point Road Bike Lane, has been identified in the project area. From north to south, the dedicated bike lane runs along Waverly Avenue to River Road, east along Division Street, south along West Avenue, east on Laurel Street, south on Cedar Street, and west on Brightwood (NYSDOT 2015).

5.11.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the no-action alternative, no construction activities would occur, and there would be no increased impact on transportation.

On-site systems require periodic pump-out by licensed companies that haul and dispose of the septage (scavenger waste) at permitted receiving and treatment facilities on Long Island. EPA suggests that septic tanks be pumped out every 3 to 5 years. Presently, the Suffolk County Department of Public Works accepts septage at wastewater treatment plants. Under the no-action alternative, maintenance of OSWS throughout the project area generates truck trips for hauling septage through residential neighborhoods on a regular basis. It is not anticipated that local roads would close or become damaged from the continued risk of OSWS failure; however, local roads could become congested by waste haulers following a flood event for a short period of time.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Construction of the proposed action would result in minor, short-term, adverse impacts on traffic throughout the project area. Construction of the West Avenue Pump Station upgrades may also result in minor, short-term, adverse traffic impacts in the immediate vicinity of the station. Traffic impacts within a specific project subarea would generally last for two to three weeks, depending on the size of the area (length of affected roadway). The construction contractor would be required to prepare and implement a traffic management plan that gives details of any required street closures and detours. Project-specific provisions would require that police and emergency service providers be given adequate advance notice of any street closures and detours. With the implementation of the traffic management plan, the short-term traffic impacts during construction would be minimized.

Operation of the proposed action would also result in beneficial effects on traffic due to a reduction in vehicular trips associated with on-site wastewater treatment systems. Under the proposed action, OSWS would be eliminated on 648 parcels, due to connection to the sewer system, thereby reducing the number of truck trips required for hauling septage relative to existing conditions.

Thus, Alternative 2 would result in minor, short-term, adverse impacts during construction with potential for a long-term, beneficial effect due to a reduction in vehicular trips associated with OSWS failure and scheduled septage pumping.

Alternative 3: Vacuum Sewer Extension

Similar to the proposed action, Alternative 3 would result in minor, short-term, adverse impacts on traffic throughout the project area during construction. Under this alternative, the number of truck trips required for hauling septage would also be reduced relative to existing conditions. Although this alternative would not require installation of LPSGPS at each property, it would include construction of individual vacuum pits and installation of larger sewer mains as well as

the construction of the central vacuum station. Therefore, construction-period traffic impacts for Alternative 3 would be similar to those described for the proposed action; however, the length of the construction period would be shorter than Alternative 2. Implementation of a traffic management plan during construction would minimize the potential for temporary traffic impacts.

Therefore, Alternative 3 would result in minor, short-term, adverse impacts during construction with potential for a long-term, beneficial effect due to a reduction in vehicular trips associated with OSWS failure and scheduled septage pumping.

5.12 Public Services and Utilities

5.12.1 Existing Conditions

The existing sewer system is divided into five drainage zones. Four of the drainage zones discharge to intermediate pump stations, low-pressure sewers, or a combination of both. The last drainage zone comprises the gravity sewer system that discharges directly to the AWTF. The Village of Patchogue AWTF operates under the SPDES permit number NY0023922, which stipulates a maximum effluent flow of 800,000 GPD from the facility, with a total nitrogen limit of <10 mg/L. The AWTF currently treats an average daily flow of approximately 300,000 GPD, with a current available capacity of 500,000 GPD. The Village of Patchogue is supplied with potable water by the Suffolk County Water Authority Distribution Area 1 (Suffolk County Water Authority 2015). For further information on water supply and wastewater collection systems, see Section 5.3, *Water Resources*.

Electric service within the village, including the project area and the existing AWTF, is provided by Public Service Enterprise Group Long Island. Service to customers in the project area is predominantly provided by overhead lines with pole-mounted transformers, although in some areas the lines are buried. Natural gas, water, and sewer lines in the project area are buried. The AWTF is powered by electricity and does not use natural gas in its operation.

5.12.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the no-action alternative, there would be no impact on the existing sewer service or other public services and utilities from construction activities. The no-action alternative would maintain the risk of OSWS failures, which would limit wastewater treatment and service at affected properties. As described above, in the event of future flood events, wastewater could be discharged to the Patchogue River and Patchogue Bay. There would be a minor, adverse impact on wastewater utilities and no impact on electric and gas utilities.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Minimal to no disruption of wastewater treatment service is anticipated during construction, as the LPSGPS would be installed and connected before the OSWS would be decommissioned. Contractors selected to construct the project would identify and map the location of underground utility transmission and gas lines prior to trenching in order to avoid affecting such utilities. Except for the minimal potential for construction equipment to damage overhead electric transmission infrastructure during construction activity, electric service would not be affected by construction or operation of the project.

LPSGPS would require a control panel at each property to automatically start and stop the pump during operation so that wastewater is pumped to the mainline sewer in the road. Each control panel requires single-phase 24 OV/30 Amp. LPSGPS operations would result in a negligible, long-term, adverse impact due to the incremental amount of electricity expended at each property (similar to that of a 40-watt light bulb) (Citizens Energy Group 2013). If there is a power failure, LPSGPS would continue to operate until reaching their capacity of approximately 70 gallons, estimated at 3 days (assuming 1.5 gallons per flush). As a result of power failure, the normal wastewater flow would decrease because appliances that require electricity to operate would be inoperable. For extended periods of power outage, village staff would follow an emergency plan and use a mobile generator to empty the basins during the duration of the outage.

Under Alternative 2, impacts on the existing AWTF would be negligible, long-term, and adverse because of additional sewage treatment service to 648 parcels. The 300,000 GPD of sewage (average daily flow) would be accommodated by available (surplus) capacity at the AWTF (H2M 2014). Because the AWTF currently uses both process treatment trains to process the current flow, electricity consumption would not increase as a result of the additional flow from the proposed action.

The amount of energy that would be used by the improved West Avenue Pump Station and existing AWTF to transport and treat the additional flow would be more substantial, with incremental use estimated at approximately 10 percent. Recent upgrades to the AWTF expansion project completed in 2011 have incorporated energy efficiency measures recommended by the New York State Energy Research and Development Authority. Upgrades to the West Avenue Pump Station under the proposed action are expected to incorporate energy efficiency measures to the extent practicable—the existing 3 horsepower pumps would be replaced with higher capacity, more efficient 3 horsepower pumps (Village of Patchogue 2015b). The 60-kW diesel generator at the West Avenue Pump Station would be replaced in-kind; therefore, no impacts are anticipated.

The proposed action would expand sewer service, resulting in a beneficial effect on public services with no adverse effect on the transmission or distribution of electricity and a negligible impact on energy load.

Alternative 3: Vacuum Sewer Extension

Similar to Alternative 2, minimal to no disruption to wastewater treatment services is anticipated during construction. Under this alternative, no LPSGPS or electrical connections between the individual properties and the collection system components would be installed; however, the new central vacuum station would require an increase in energy use. This is due to the additional energy used by the pumping stations and the added energy required to operate the vacuum switch. As a result, Alternative 3 would likely result in a larger incremental increase in electric use than the proposed action. However, Public Service Enterprise Group Long Island is expected to have the capacity to serve this alternative; therefore, this alternative would result in negligible impacts on the transmission or distribution of electricity. Similar to Alternative 2, construction of Alternative 3 would be unlikely to affect buried or overhead utility transmission lines.

5.13 Public Health and Safety

5.13.1 Existing Conditions

The project area is served by the Suffolk County Police Department 5th Precinct, Suffolk County Department of Health Services, Village of Patchogue Public Safety Department, and the Patchogue Fire Department.

5.13.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

There would be no construction-related public health or safety effects under the no-action alternative. The no-action alternative would result in moderate, long-term, adverse impacts on public health and safety associated with OSWS failures. During and after storm events, continued OSWS failures would result in uncontrolled discharges of raw sewage that create pathways for human exposure to harmful pathogens and other pollutants. Public health risks include raw (untreated) sewage backups into buildings or yards and overflows onto the land or into surface waters; health and safety hazards associated with the cleanup of raw sewage backups; loss of wastewater treatment; and beach closures as a result of non-point source pollution. Releases of raw sewage from failing OSWS during flood events may pollute surface and groundwater, resulting in moderate, long-term, adverse impacts on surface and groundwater quality, as discussed in Section 5.3, *Water Resources*, with associated effects on public health. Chronic releases of raw sewage from failing OSWS would continue to result in excessive nitrogen and pathogen loading that can damage wetlands and coastal resources. The continued degradation of tidal wetlands could result in increased flood hazards, as discussed in Section 5.3, *Water Resources*, which would increase impacts on public health and safety. Therefore, the risk of OSWS failures and the associated discharge of partially treated or untreated sewage would continue to present a public health hazard, not only for the Patchogue community, but also for the larger South Shore Estuary Reserve environs. Under the no-action alternative, future excessive nitrogen loading would continue to have negative impacts on groundwater supply resulting in moderate, long-term, adverse impacts on public health.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Construction of the proposed action would result in minor, short-term, adverse impacts on public health and safety. Construction activities would generate dust, and construction equipment would produce emissions as well as generate noise, resulting in minor, short-term impacts on air quality and noise in the vicinity of construction activity. To mitigate potential effects during construction, all construction activities would be performed using qualified personnel and in accordance with the standards specified in OSHA regulations. Contractors would adhere to federal, state, and local regulations, including those dealing with air quality and noise. Appropriate signage and barriers would be in place prior to construction activities to alert pedestrians and motorists of project activities. Construction activities would be coordinated with Village and County emergency service providers and there would be no impact on response times.

The proposed action would protect public health and safety in the area by minimizing the risk of discharging partially treated or untreated sewage into buildings or yards, and overflows onto the land or into surface waters, effectively mitigating the moderate, long-term, adverse public health

and safety risks presented by the no-action alternative. The sewer district expansion has the dual purpose of mitigating short-term and repetitive, adverse impacts on human life and property and mitigating long-term, adverse impacts associated with OSWS failures. The proposed action would enhance the village's ability to provide continuous operation and wastewater treatment services during normal and severe weather.

Maintaining these operations would reduce the risk of discharges from on-site sanitary disposal systems, which would benefit water quality. As described in Section 5.3, *Water Resources*, the water quality would create stronger wetlands which would assist in reducing tidal action and flooding which reduces public safety issues during floods. Thus, the proposed action would result in minor, short-term, adverse impacts and long-term, beneficial effects on public health and safety.

Alternative 3: Vacuum Sewer Extension

Similar to Alternative 2, construction of Alternative 3 would result in minor, short-term, adverse impacts on public health and safety during construction. It also seeks to protect public health and safety in the area by minimizing the potential for OSWS failures to back up into properties creating a health hazard during floods and storm events. The alternative would also reduce the amount of untreated sewage that currently reaches the nearby waterbodies as previously discussed. Alternative 3 would result in minor, short-term, adverse impacts during construction, but would result in long-term, beneficial effects.

5.14 Hazardous Materials

NYSDEC defines hazardous substances as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that pose a substantial present or potential hazard to human health and the environment (NYSDEC 2014c). Hazardous materials and wastes are regulated under a variety of federal and state laws, including 40 CFR Part 260, the Resource Conservation and Recovery Act of 1976 (42 USC 6901 et seq.), Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 USC 9601 et seq.), Solid Waste Act, the Toxic Substances Control Act, and the Clean Air Act of 1970 (42 USC 7401 et seq.). OSHA standards under the Occupational Safety and Health Act seek to minimize adverse impacts on worker health and safety (U.S. Department of Labor no date). Evaluations of hazardous substances and wastes must consider whether any hazardous material would be generated by the proposed activity and/or already exists at or in the general vicinity of the site (40 CFR 312.10). If hazardous materials are discovered, they must be handled by properly permitted entities. The New York Department of Labor permits entities for asbestos waste abatement, and NYSDEC issues permits for transportation and disposal of hazardous waste.

5.14.1 Existing Conditions

Hazardous material is not expected to be generated by residential uses, but could be generated by commercial and industrial uses within the project area. The project area contains 38 facilities that are regulated by EPA, five of which are listed as Resource Conservation and Recovery Act facilities, indicating that they generate, transport, and treat, store, or dispose of hazardous waste (EPA 2015a). None of these facilities are listed on the 2020 Corrective Action Baseline, a database comprising all contaminated facilities that are expected to need corrective action (EPA 2014a). In addition, no EPA superfund sites have been identified in the project area or within 0.5 mile of the project area (EPA 2015b). The project site has never been used as a municipal, commercial, or

industrial solid waste management facility, nor does it adjoin property that has ever been used as a solid waste management facility.

No known NYSDEC remediation sites are located within the project area; however, one site is within 0.5 mile of the project area boundaries (Appendix A, Figure 13). The remediation site, the former Patchogue manufactured gas plant (NYSDEC site code 152182), is listed under the State Superfund Program and Brownfield Cleanup Program (NYSDEC 2015c). Located on 3.6-acre parcel at 234 West Main Street in the Village of Patchogue, the site is adjacent to the existing AWTF and the Patchogue River. According to NYSDEC Division of Environmental Remediation data, a remedial investigation and design were completed in 2011 and 2012 (respectively), and remedial action was completed in March 2013. According to NYSDEC data, the environmental site assessment (and USFWS) concluded that there is not a significant risk associated with the manufactured gas plant-related contamination to the fish and wildlife resources present. The site health assessment indicated that people are not at risk for drinking contaminated water because the area is served by public water supply, and there are no private wells in the area. The only known risk to humans is from soil vapor intrusion, which occurs when people enter the site and may come into contact with contaminants in the soil via walking on dirt or otherwise disturbing the soil.

Existing subsurface conditions within the project area have not been adversely affected by the former Patchogue manufactured gas plant site. It is expected that the Resource Conservation and Recovery Act facilities have not had an adverse effect on the existing subsurface conditions in the project area.

5.14.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

Under the no-action alternative, there would be no effects related to hazardous materials because there would be no construction and existing conditions would not change.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Construction of the proposed action has the potential to generate some hazardous materials through the use of fuels and lubricants. The contractor would be required to have a spill prevention and control plan on-site, and equipment would not be operated in or over water. Construction also has the potential to uncover hazardous materials in excavated soils, although the potential risk is very low based on known contaminant sources.

During construction of the proposed action, the contractor would be responsible for ensuring that all excavated material and soils are handled, transported, and disposed of in accordance with all applicable regulations. If soils (or other material) encountered during excavation or any construction activity indicate signs of potential contamination, the contractor would be required to characterize the soil (and/or other material) to determine an appropriate upland disposal site. Any hazardous waste produced would be managed by NYSDEC-permitted haulers and disposal sites. The contract documents would state that the contractor would comply with all applicable federal, state, and local laws, codes, and regulations, including but not limited to 6 NYCRR Part 375, Environmental Remediation Programs. If fill material is required to backfill trenches, it would be clean fill.

Abandonments of commercial cesspools and septic systems would be overseen by the Suffolk County Department of Health Services, requiring any contamination in the systems to be remediated. Therefore, negligible hazardous material-related impacts would result from the proposed action. Alternative 2 would result in potential, negligible, short-term, adverse impacts related to hazardous materials.

Alternative 3: Vacuum Sewer Extension

During construction of Alternative 3, there would be the potential to generate hazardous materials through the use of fuels and lubricants. Construction also has the potential to uncover hazardous materials in excavated soils (or other material) and the contractor would be responsible for handling, transporting, and disposing of all excavated soils and other material in accordance with all applicable rules and regulations. Similar to the proposed action, Alternative 3 would result in potential, negligible, short-term, adverse impacts related to hazardous materials.

5.15 Climate Change

EO 13693, Planning for Federal Sustainability in the Next Decade, sets sustainability targets for the environmental, energy, and economic performance of federal agencies and calls for specific management strategies for agencies to improve sustainability with greenhouse gas reduction as a key priority. EO 13653, *Preparing the United States for the Impacts of Climate Change*, sets standards to prepare the United States for the impacts of climate change and supporting climate-resilient investment. According to draft CEQ guidance for considering climate change in environmental reviews, agencies should consider the following when addressing climate change: (1) the potential effects of a proposed action on climate change as indicated by its greenhouse gas emissions; and (2) the implications of climate change for the environmental effects of a proposed action.

5.15.1 Existing Conditions

Suffolk County experiences frequent flood events from unnamed seasonal storms, larger nor'easters, and hurricanes such as Hurricane Sandy in 2012, Hurricane Irene in 2011, and a nor'easter in 2009. As global sea levels rise and catastrophic storms increase in frequency, Suffolk County's 980 miles of coastline become even more vulnerable. Climate projections vary widely, with the most recent report from the Intergovernmental Panel on Climate Change (IPCC 2013) predicting that climate warming will cause a mean increase of 1.4 to 2.4 feet in sea level by 2100, while the National Research Council (2012) predicts an even larger increase of 1.7 to 4.6 feet by 2100. The result is an anticipated 1- to 2-foot rise in groundwater, according to the *Suffolk County Comprehensive Water Resources Management Plan*. In addition to sea-level rise, additional evidence indicates that both precipitation and the number of extreme precipitation events are increasing in the northeastern United States.

Greenhouse gases contributing to climate change include carbon dioxide, methane, nitrous oxide, and fluorinated gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Construction activities, such as the combustion of diesel and gasoline to power heavy equipment, emit carbon dioxide and smaller quantities of methane and nitrous oxide (EPA 2009). Greenhouse gas emissions also result from the production of the materials used in the construction process (referred to as embedded carbon). For the long-term operation of this project, the relevant greenhouse gases for discussion are those associated with wastewater treatment processes:

methane and nitrous oxide (EPA 2014b). Wastewater treatment does not result in emissions of hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride (EPA 2015c). Under existing conditions, the existing AWTF releases greenhouse gas emissions. In addition, greenhouse gas emissions result from the septic tanks in the currently unsewered portion of the project area. Per-capita methane emissions of centralized treatment facilities are generally lower than the emissions associated with on-site septic systems (EPA 2014b). For example, EPA estimates that 66.2 percent of methane emissions from domestic wastewater management are from septic systems, despite the fact that only 20 percent of the population uses septic systems.

5.15.2 Potential Impacts and Proposed Mitigation

Alternative 1: No Action

No project-related construction greenhouse gas emissions would occur under the no-action alternative. Long-term, greenhouse gas emissions associated with existing septic systems and the existing AWTF would continue.

The effects of climate change, including sea-level rise, higher groundwater elevations, increased heavy precipitation or storm events, and a greater incidence of coastal flooding, mean that the no-action alternative would result in direct effects of increased OSWS failures as a result of flooding. Because of increased OSWS failures, the no-action alternative would have minor, long-term, adverse impacts on water quality impairment and coastal wetland degradation. Further, the continued degradation of tidal wetlands would reduce their ability to attenuate wave action and mitigate the impacts of storm surge.

Therefore, the no-action alternative would have a minor long-term, adverse impact on local resources from climate change impacts and would continue the existing minor, long-term, adverse impacts on greenhouse gas emissions and sea level rise.

Alternative 2: Proposed Action: Out-of-District Low-Pressure Sewer Extension

Construction activities would result in negligible, short-term, greenhouse gas emissions from operation of equipment and worker commutes.

The proposed action would result in a net reduction in greenhouse gas emissions related to wastewater treatment by switching approximately 648 households from septic to centralized treatment. It could reduce methane emissions approximately 86 percent based on EPA national-level inventory data (EPA 2014b); however, the actual emissions reduction would depend on the detailed engineering design. Data to compare the potential change in nitrous oxide emissions between centralized treatment and septic systems is not available; however, based on the substantial reduction in methane emissions it can be concluded that the net long-term effect on greenhouse gas emissions would be beneficial. Alternative 2 would result in negligible increases in greenhouse gas emissions associated with the 10 percent increase in electricity consumption at the West Avenue Pump Station, as well as the on-site LPSGPS that expend an incremental amount of electricity equal to that of a 40-watt light bulb times the number of LPSGPS connections (Citizens Energy Group 2013).

Due to decreased nitrogen loading, the proposed action would have indirect benefits of mitigating potential climate change impacts, including increased tidal flooding, because it would slow the

degradation of wetlands. Healthy tidal wetlands can slow water velocity and stabilize the shoreline through sediment deposition, providing a buffer against climate change and coastal submergence.

Therefore, the proposed action would result in negligible, short-term, adverse impacts due to construction and negligible, long-term operational impacts on climate change through the generation of greenhouse gases. Operation of the proposed action would also have an overall beneficial effect on both greenhouse gas sequestration and sea-level rise mitigation through beneficial effects on tidal wetland health.

Alternative 3: Vacuum Sewer Extension

The greenhouse gas emissions associated with Alternative 3 would generally be the same as those described under the proposed action, with temporary construction emissions and a reduction in greenhouse gas emissions associated with wastewater treatment over the long term. Pumping operations at the new central vacuum pump station would generate additional greenhouse gas emissions associated with electricity consumption as compared to the existing condition.

Similar to Alternative 2, this alternative would decrease nitrogen loading, resulting in indirect benefits by mitigating potential climate change impacts, including increased tidal flooding, because it would slow the degradation of wetlands. However, these benefits would accrue to a lesser extent than under the proposed action.

Therefore, Alternative 3 would have overall negligible, short-term, adverse impacts on climate change and would have beneficial effects in mitigating against sea-level rise; however, the impacts would not be as beneficial as those detailed under the proposed action.

5.16 Cumulative Impacts

In accordance with NEPA, this EA considers the overall cumulative impact of the proposed action and other actions that are related in terms of time or proximity. CEQ regulations define cumulative impacts as the “impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what federal agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7). In addition to NEPA, other statutes require federal agencies to consider cumulative impacts. These include the CWA Section 404 (b)(1) guidelines; the regulations implementing the conformity provisions of the Clean Air Act; the regulations implementing Section 106 of the NHPA; and the regulations implementing Section 7 of the Endangered Species Act.

Cumulative impacts were determined by combining the impacts for each alternative with other past, present, and reasonably foreseeable future actions that would also result in beneficial effects or adverse impacts. The combined effects of these actions are evaluated to determine if they could result in any cumulative impacts.

Cumulative impacts are most likely to arise when a relationship or synergy exists between the proposed action and its alternatives with other actions expected to occur in a similar location or during a similar time period. Actions overlapping with, or in proximity to, the proposed action and its alternatives would be expected to have more potential for a relationship than those with a greater degree of spatial separation. Likewise, actions closer in time to the proposed action at each

alternative would be expected to have more potential for a relationship than those with a greater degree of temporal separation.

In defining the contribution of each alternative to cumulative impacts, the following thresholds and terminology are used:

- **Imperceptible:** The incremental impact contributed by the alternative to the overall cumulative impact is such a small increment that it is impossible or extremely difficult to discern.
- **Noticeable:** The incremental impact contributed by the alternative, while evident and observable, is still relatively small in proportion to the overall cumulative impact.
- **Appreciable:** The incremental impact contributed by the alternative constitutes a large portion of the overall cumulative impact.

5.16.1 Projects Considered for Analysis of Cumulative Impacts

Reasonably foreseeable projects considered in this analysis include the Suffolk County Coastal Resiliency Initiative and the Extension of Sanitary Sewers and Drainage Improvements for River Avenue.

Suffolk County Coastal Resiliency Initiative

As discussed in Section 1.0, *Introduction*, the Suffolk County Coastal Resiliency Initiative would be accomplished through five projects. In addition to the proposed action and its alternatives evaluated in this EA, these projects include SSD #3 and the Carlls, Connetquot, and Forge River watersheds (see Section 1.0 for details).

As the remaining projects in the Initiative are further developed and advance into the environmental review process, the potential for cumulative impacts will be analyzed in each environmental review document to ensure that separate environmental review processes for each project are no less protective of human health and the environment.

Extension of Sanitary Sewers and Drainage Improvements for River Avenue

The Extension of Sanitary Sewers and Drainage Improvements for River Avenue would occur adjacent to the proposed action. This project would service Sunset Lane, Price Street, and Mapes Avenue with low-pressure sewers which would connect to the existing low-pressure sewer system at the intersection of Crescent Street and River Avenue. The River Avenue Project would provide out-of-district sewer connections to an area adjacent to and directly south of the project area for the proposed action (H2M 2012).

As the lead agency for the action under SEQRA, the Village of Patchogue adopted a negative declaration for the Extension of Sanitary Sewers and Drainage Improvements for River Avenue (the River Avenue Project) on April 22, 2015, with construction anticipated to be completed by May 2016.

5.16.2 Cumulative Impacts

The proposed action is geographically distant from the other projects in the Suffolk County Coastal Resiliency Initiative, and while it would be adjacent to the River Avenue Project, construction would not occur concurrently. Therefore, no short-term cumulative impacts during construction

would result to geology, soils and topography, air quality, vegetation, wildlife and fish, threatened and endangered species, cultural resources, land use, noise, transportation, public services, public health and safety, hazardous materials, and climate change.

In the long-term, during project operation, the proposed action would have no impact, negligible, or minor, adverse impacts that would be mitigated on geology, soils and topography, air quality, cultural resources, land use, noise, transportation, and hazardous materials. Therefore, the proposed action would have an imperceptible contribution to long-term cumulative impacts on these resources.

When combined with other reasonably foreseeable projects, the proposed action would contribute to reduced sanitary wastewater overflow during future flood events, resulting in a noticeable contribution to beneficial cumulative impacts on the health of vegetation in adjacent wetlands, as well as habitats used by wildlife and fish and threatened and endangered species.

The proposed action would have noticeable beneficial cumulative effects when combined with the SSD #3, Carlls River, Connetquot River, Forge River, and River Avenue projects on nitrogen loading in the Great South Bay. Given the time of travel to receiving waterbodies in the areas being sewered, it is expected that nitrogen levels in the Great South Bay would be diminished by as much as 13 percent in as little as 2 to 5 years from operation of all projects in the Suffolk County Coastal Resiliency Initiative. Wetland restoration and coastal protection benefits would begin to accrue in years 6 to 10, as non-point nitrogen inputs into the Great South Bay and other receiving waterbodies diminish further. Once nitrogen loads are reduced, it is projected that subaquatic vegetation would begin to expand in 20 to 25 years (DHSES 2015).

Removing OSWS would reduce localized shallow groundwater recharge; however, this loss of recharge would correspond to a reduction in contaminant flow into the shallow aquifer, and may also result in a lowering of the water table, which could lead to less flooding in the low-lying areas within each individual project area. Given the overall size of the aquifer, the decrease in recharge is considered to be negligible and would not be a concern because residents are supplied with drinking water by the Suffolk County Water Authority, and the zone of contribution to the well fields in Patchogue would not be impacted by the project.

The existing AWTF SPDES permit (number NY0023922) stipulates a maximum effluent flow of 800,000 GPD from the facility, with a total nitrogen limit of <10 mg/L. The AWTF currently treats an average daily flow of approximately 300,000 GPD, with a current available capacity of 500,000 GPD. The River Avenue Project would generate approximately 31,000 GPD, which when added to the estimated 300,000 GPD increase in average daily flow resulting from the proposed action would result in a cumulative increase of 331,000 GPD in additional average daily flow of wastewater to the AWTF (H2M 2012). The AWTF has existing capacity to support the additional flows associated with both projects. When both projects are implemented, the AWTF would have an estimated 169,000 GPD remaining in available capacity.

The proposed action would also have a noticeable contribution to beneficial cumulative effects for the entire project area, including minority and low-income populations, because of reduced cost for clean-up of contaminants, potential increased property values, growth-inducing impacts, increased tourism revenues from the reduced frequency of beach closures because of improved water quality, and the revitalization of the shellfishing industry.

It would also have a noticeable contribution to beneficial cumulative effects on public health and safety by minimizing the risk of discharging partially treated or untreated sewage into the area and

effectively mitigating the moderate, long-term, adverse public health and safety risks that would otherwise persist under the no-action alternative. Due to decreased nitrogen loading, the proposed action would contribute to cumulative benefits of mitigating potential climate change impacts.

5.17 Irreversible and Irretrievable Impacts

Resources, both natural and man-made, would be expended in the construction and operation of the proposed action. An estimated 21,175 cubic yards of soil would be removed from the sewer extension project area. Construction of the proposed action would require the irreversible and irretrievable commitment of energy, construction materials, and funds necessary to install the sewer infrastructure, LPSGPS, and lateral connections and upgrade the West Avenue Pump Station. Operations of the proposed action also would require the irreversible and irretrievable commitment of the incremental amount of energy that would be consumed by the West Avenue Pump Station, existing AWTF, and LPSGPS to provide sewer service to the new 648 out-of-district properties. These resources are considered an irretrievable commitment because they would be committed to or consumed by the proposed action and would be unavailable for use elsewhere.

6.0 PERMITS AND PROJECT CONDITIONS

6.1 Permits, Reviews and Approvals

GOSR and the Village of Patchogue are responsible for obtaining all applicable federal, state, and local permits; reviews and other authorizations for project implementation prior to construction; and adherence to all permit conditions. Any substantive change to the approved scope of work will require re-evaluations by FEMA for compliance with NEPA and other laws and executive orders. The anticipated permits, reviews, and approvals required to complete the proposed action are provided in Table 6.

Table 6. Anticipated Permits, Reviews, and Approvals

Permit, Approval, or Consultation	Agency
Federal	
Section 106, NHPA/Tribal Consultation	New York State Office of Parks, Recreation and Historic Preservation
Section 7 Threatened and Endangered Species	USFWS
Section 1424(e) Safe Drinking Water Act of 1974 – Sole Source Aquifer Protection Program	EPA
New York State	
Freshwater Wetlands – Environmental Conservation Law Article 24	NYSDEC
Tidal Wetlands – Environmental Conservation Law Article 25	NYSDEC

Permit, Approval, or Consultation	Agency
Water Quality Certification – Section 401 of the CWA	NYSDEC
Protection of Waters (Stream Disturbance) – Environmental Conservation Law Article 15	NYSDEC
SPDES General Permit for Stormwater Discharges from Construction Activity / SWPPP	NYSDEC
Natural Heritage Program Species Consultation	NYSDEC
Coastal Zone Management – State Coastal Consistency Concurrence	New York State Department of State
Section 14.09 New York State Historic Preservation Act	New York State Office of Parks, Recreation and Historic Preservation
Approval of design and construction for infrastructure crossing LIRR	Metropolitan Transportation Authority LIRR
Local	
Suffolk County Article 6 and Article 7	Suffolk County Department of Human Services
Approval of design and space requirements	Suffolk County Department of Health Services, Suffolk County Department of Public Works
Road opening permits	Suffolk County Department of Public Works
Suffolk County Sanitary Code Article 9 and Article 12	Suffolk County Department of Human Services
Intermunicipal Agreement with Suffolk County	Suffolk County
Coastal Zone Management – Local Waterfront Revitalization Program Coastal Consistency Review	Patchogue

6.2 Project Conditions

The subrecipient is responsible for obtaining and adhering to all applicable federal, state, and local permits; permit conditions; regulatory compliance; and authorizations for project implementation. As such, the following agency consultations have taken place (see Appendix I):

- Consultation with OPRHP was initiated by the Suffolk County Department of Public Works on April 20, 2015. Louis Berger completed a Phase IA Cultural Resource assessment in July 2015. On September 10, 2015, OPRHP requested revisions to the report and that separate architectural and archaeological reports be resubmitted. Recommendations for No Historic Properties Affected on architectural resources were made in a letter dated September 3, 2015. OPRHP concurred with the finding of No

Historic Properties Affected by the proposed action on November 23, 2015. Recommendations for no additional archaeological testing were made in a letter dated November 23, 2015. Concurrence with this finding is outstanding.

- On January 12, 2016, FEMA consulted with NYSDOS regarding the proposed action's Coastal Zone Consistency Determination, in accordance with the requirement of the Coastal Zone Management Act of 1972 (15 CFR Part 930), prior to the release of federal funding to the grant recipient. NYSDOS responded on January 26, 2016, that the project meets the NYSDOS' general consistency concurrence criteria.
- A sole source aquifer screening was conducted in accordance with Section 1424(e) of the Safe Drinking Water Act of 1974 dated June 4, 2015, with EPA approval and suggestions to minimize environmental impacts dated July 1, 2015.
- NYSDEC consultation pertaining to SPDES Permit dated March 9, 2015, with NYSDEC approval received on April 14, 2015.
- NYSDEC NY Natural Heritage Program consultation confirming no rare or state-listed animals or plants or significant natural communities within the project area dated May 21, 2015.
- NYSDEC Nature Explorer consultation confirming animals, plants and habitats within the project area, the Town of Brookhaven and the Suffolk County boundaries dated February 4, 2016.

Any substantive change to the approved scope of work will require re-evaluation by FEMA for compliance with NEPA and other environmental and historic preservation laws and executive orders. The village must also adhere to the following conditions during project implementation and consider the conservation recommendations outlined below. Failure to comply with grant conditions may jeopardize federal funds.

- EPA conformity analysis shall be conducted in accordance with federal general conformity regulations as required by the Clean Air Act to ensure that emissions would not affect the state's ability to meet the NAAQS and New York State Ambient Air Quality Standards.
- Floodplain Best Available Data shall be used to determine the 100-year floodplain elevation for final engineering design in accordance with 44 CFR Part 9. At the time of this publication, FIRM panels 36103C0694H BS 36103C0907H, dated September 25, 2009, are the best available data.
- BMPs that prevent the introduction, establishment, and spread of invasive plant species shall be implemented. Invasive species shall be removed when encountered, per U.S. Department of Agriculture and state agency guidelines, and suppression or removal practices to prevent their introduction, establishment, and spread shall be implemented. Woody materials and debris shall be treated and stored to manage for invasive insects, particularly for sites in Asian longhorn beetle and emerald ash borer quarantine zones. Any trees that may need to be replaced as a result of the project should be tree species that are resistant to these invasive insects.
- Removal of trees will occur outside of the bird breeding season between April 1 and September 30.

- Electric utility connections shall be approved by the affected public service companies and be completed in accordance with their requirements and local building codes.
- Excavated soils and waste materials, including hazardous waste, shall be managed and disposed of in accordance with applicable federal, state, and local regulations. Solid waste haulers will be required to have a NYSDEC waste transporter permit and all waste will need to be disposed of or processed at a permitted solid waste management facility.
- Proposed construction shall comply with the NYSDEC SPDES permit for Stormwater Discharge from Construction Activity, in accordance with New York State Environmental Conservation Law. A Soil Erosion and Sediment Control Plan and SWPPP shall be developed and implemented.
- Construction BMPs shall be employed during construction, including soil erosion and sediment control measures, dust control, noise abatement, and restriction of work areas to limit vegetation removal and habitat impacts.
- Construction BMPs shall be employed, such as covering haul trucks and soil piles, restoring/replanting areas where vegetation is disturbed to prevent erosion and dust, and limiting idling to five minutes or less in accordance with New York State regulations.
- In the event of an unexpected discovery of threatened or endangered species, the subrecipient shall immediately stop construction until consultation by FEMA with USFWS has been completed.
- Noise abatement in residential areas shall limit construction activities, including operation of heavy machinery, to comply with the Village of Patchogue Noise Code. As such, construction shall occur between the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday, excluding legal holidays. Construction activities within 200 feet of noise-sensitive receptors shall be avoided to the extent practicable.
- Excavation dewatering shall adhere to BMPs for water management and adherence to all applicable local, state, and federal regulations. Treatment of groundwater may be required prior to recharge back into the shallow groundwater flow system, if required.
- A Health and Safety Plan shall be developed and OSHA standards shall be followed during construction to avoid adverse impacts on worker health and safety. Procedures will be established in the Health and Safety Plan for the proper handling and treatment of any unforeseen soil contamination in the case of soil excavation.
- In the event of an unexpected discovery of cultural resources, the subrecipient shall immediately stop construction in the vicinity of the discovery; and take all reasonable measures to avoid or minimize harm to the property until FEMA has completed consultation with the SHPO.
- Adequate maintenance of equipment shall be ensured, including proper engine maintenance, adequate tire inflation, and proper maintenance of pollution control devices.
- Construction activities shall not commence until 15 days after the date that the FONSI has been signed as “Approved.”

7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

This EA will be made available for agency and public review and comment for a period of 45 days. The public information process will include a public notice with information about the proposed action in the Long Island Advance weekly newspaper, with targeted outreach to environmental justice populations through notices to community organizations. The EA will also be made available for download at <http://stormrecovery.ny.gov/environmental-docs>.

A hard copy of the EA will be available for review at the following locations:

New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 10004

Patchogue Village Hall
14 Baker Street
Patchogue, NY 11772

Patchogue-Medford Library
54-60 East Main Street
Patchogue, New York 11772

Interested parties may request an electronic copy of the EA by emailing FEMA at FEMA-4085-Comment@fema.dhs.gov. This EA reflects the evaluation and assessment of the federal government, the decision maker for the federal action; however, FEMA will take into consideration any substantive comments received during the public review period to inform the final decision regarding grant approval and project implementation. The public is invited to submit written comments by emailing FEMA-4085-Comment@fema.dhs.gov or via mail to:

FEMA Region II – DR-4085-NY
26 Federal Plaza
New York, NY 10278

Attn: Village of Patchogue Out-of-District Sewer Extension EA Comments.

If no substantive comments are received from the public and/or agency reviewers, the EA will be adopted as final, and FEMA will issue a FONSI. If FEMA receives substantive comments, it will evaluate and address comments as part of the FONSI documentation or in a final EA.

Part 1 of the SEQRA Full Environmental Assessment Form was published on the New York Storm Recovery website. On May 4, 2015, GOSR submitted it to the Village of Patchogue, Town of Brookhaven, Suffolk County Department of Health Services, Suffolk County Department of Public Works, Suffolk County Council on Environmental Quality, Suffolk County Department of Economic Development and Planning, NYSDEC – Region 1, New York State OPRHP, New York State Department of State, New York State Department of Health, LIRR, New York State Environmental Facilities Corporation, and New York State Division of Homeland Security and Emergency Services under the coordinated review procedure in accordance with SEQRA. No agency objected to GOSR acting as lead agency for the purpose of implementing SEQRA.

On May 4, 2015, GOSR submitted coordination letters to HUD – Region 2, FEMA – Region 2, EPA – Region 2, and USACE – New York District.

The public outreach program for the proposed action has been complemented by the public review process for this EA under NEPA and by that required to comply with EO 11988, Floodplain Management, and EO 11990, Protection of Wetlands. Compliance with EOs 11988 and 11990 require the early notice of proposed action, which was published on the New York Storm Recovery website and in the Long Island Advance on June 4, 2015. The notice invited all interested persons, parties, and agencies to submit written comments regarding the proposed use of federal funds to finance the proposed action.

8.0 CONCLUSION

The analysis within this EA shows that the proposed action most closely meets the project purpose and need. The proposed action would mitigate short-term and repetitive, adverse impacts on human life and property associated with OSWS failures in the project area caused by natural hazards. The proposed action also would help to mitigate long-term, adverse impacts associated with such failures on surface waters and coastal wetlands that reduce the ability of these waters and wetlands to provide natural protection against storm surge.

This EA concludes that the construction and operation of the low-pressure, out-of-district sewer extension and West Avenue Pump Station upgrades would have no major impact on the human and natural environments and is expected to improve some aspects of the environment in the vicinity of the project site, such as water resources, climate change, public services and utilities, and public health and safety.

As supported by the technical analyses provided in this EA, the proposed action would not result in major impacts with respect to geology, soils, and topography; air quality; vegetation; wildlife and fish; threatened and endangered species; cultural resources; aesthetic resources and neighborhood character; land use and planning; environmental justice; noise; transportation; and hazardous materials. No major cumulative impacts would result from the proposed action in conjunction with the Initiative or River Avenue Sewer Project.

Short-term impacts during construction are anticipated on soils, surface water, transportation, air quality, and noise. In cases where short-term potential impacts have been identified, impacts would be mitigated through design, regulatory compliance, and/or implementation of BMPs as described in Section 6.2, *Project Conditions*.

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10.0 SUMMARY OF IMPACTS

Table 7. Summary of Impacts

Section	Area of Evaluation	Alternative 1: No Action	Alternative 2: Proposed Action: Out of District Low-Pressure	Alternative 3: Vacuum Sewer Extension
5.1	Geology, Topography, and Soils	No impact on geological and topographic resources and continued minor impact on soil.	No impact on geological resources with negligible, adverse impacts on soil and topographic resources.	No impact on geological resources with negligible, adverse impacts on soil and topographic resources.
5.2	Air Quality	Negligible impact from existing generators.	Negligible, short-term adverse impact during construction in terms of criteria pollutants and no long-term impacts.	Minor, short-term, adverse impact during construction in terms of criteria pollutants and no long-term impacts.
5.3	Water Resources			

Section	Area of Evaluation	Alternative 1: No Action	Alternative 2: Proposed Action: Out of District Low-Pressure	Alternative 3: Vacuum Sewer Extension
	Water Quality	Moderate, long-term, adverse impact on water quality from the ongoing risk of discharge of sanitary wastewater from failing OSWS during flood events.	Minor, short-term, adverse, impact from construction due to excavation and dewatering with negligible, long-term, adverse impact on the Upper Glacial Aquifer water balance of approximately 1,133 MGD. Negligible, adverse impact on the elevation of the water table in the project area. Overall, beneficial effects due to reduced loading of nitrogen and pathogens to Patchogue River and Patchogue Bay.	Impacts similar to Alternative 2; however, beneficial effects on water quality would be proportionately smaller.
	Wetlands	Potential, moderate, long-term, adverse impact on wetlands within the project area from the continued release of contaminants from OSWS failure during flood events.	Minor, beneficial effects on wetlands from the reduction of total nitrogen loading to the coastal waters, preventing deterioration of wetland vegetation.	Impacts similar to Alternative 2; however, beneficial effects on wetlands would be proportionately smaller.
	Floodplains	Moderate, long-term, adverse impacts on floodplains as a result of nitrogen loading from failing OSWS.	Short-term, minor, adverse impacts during construction with, long-term, beneficial, effects on floodplains due to stabilization of shoreline from healthier wetlands that provide flood protection. However, there is potential for impact of sustained risk as a result of the potential for induced development of vacant parcels within the floodplain.	Impacts similar to Alternative 2; however, beneficial effects on floodplains would be proportionately smaller.

Section	Area of Evaluation	Alternative 1: No Action	Alternative 2: Proposed Action: Out of District Low-Pressure	Alternative 3: Vacuum Sewer Extension
	Coastal Resources	Minor, long-term, adverse impact on coastal resources as a result of continued release of nitrogen and pathogens that deteriorate aquatic vegetation and wetlands and reduce recreation and commercial activities for the public.	Negligible, short-term, adverse impact during construction mitigated by BMPs, but potential for minor, long-term, beneficial effects on coastal resources from reductions in nitrogen and pathogen loading.	Impacts similar to Alternative 2; however, beneficial effects on coastal resources would be proportionately smaller.
5.4	Vegetation	Potential, minor, indirect, adverse impact from potential sanitary wastewater overflow from future flood events.	Negligible, short-term, adverse impact within the project area because some street landscaping may need to be removed and because of potential for temporary soil erosion effects during construction with potential for minor, beneficial, long-term effects on the health of vegetation in adjacent wetlands by preventing sanitary wastewater overflow during future flood events.	Impacts would be similar to Alternative 2. Negligible, adverse impact within the project area, and a negligible to minor, beneficial, long-term effects on the vegetation in adjacent wetlands

Section	Area of Evaluation	Alternative 1: No Action	Alternative 2: Proposed Action: Out of District Low-Pressure	Alternative 3: Vacuum Sewer Extension
5.5	Wildlife and Fish	No short-term impacts with moderate, long-term, adverse impacts on wildlife and fish habitat from potential sanitary wastewater overflow from future flood events.	Negligible, short-term, adverse impact on wildlife and fish from vegetation removal, noise, and activity during construction, with potential beneficial effects on nearby wildlife and fish habitats as a result of reduced pollution in adjacent waterways.	Negligible, short-term, adverse impact on wildlife and fish from vegetation removal, noise, and activity during construction, more so than Alternative 2, due to construction of the new central vacuum station. Potential beneficial effects on nearby wildlife and fish habitats as a result of reduced pollution, proportionally less beneficial than Alternative 2.
5.6	Threatened and Endangered Species and Critical Habitats	Potential minor, adverse impact on nearby potential habitat for protected species because there would be no reduction of sewage overflow into nearby waterways during future flood events.	No adverse effect with potential beneficial effects on adjacent habitats that may be utilized by threatened and endangered species as a result of reduced pollution.	No adverse effect with potential beneficial effects on adjacent habitats that may be utilized by threatened and endangered species as a result of reduced pollution; however, proportionally less beneficial than Alternative 2 due to decommissioning of fewer OSWS.

Section	Area of Evaluation	Alternative 1: No Action	Alternative 2: Proposed Action: Out of District Low-Pressure	Alternative 3: Vacuum Sewer Extension
5.7	Cultural Resources	No impact.	Potential long-term, adverse impact on archaeologically sensitive resources due to ground disturbance associated with construction of service laterals or LSPS. Potential negligible, adverse impact on architectural resources if construction diminishes the integrity of significant landscape features associated with historic properties. If adverse effects cannot be avoided, mitigation measures would be employed.	Potential, long-term, adverse impact on archaeologically sensitive resources due to ground disturbance associated with construction of the central vacuum station. Similar potential for adverse impact on architectural resources as Alternative 2. If adverse effects cannot be avoided, mitigation measures would be employed.
5.8	Land Use and Planning	Minor, adverse impacts because the alternative is not consistent with local planning documents.	No direct impact, but potential for minor, indirect, adverse, long-term impact due to potential development of up to 12 vacant parcels.	Minor, long-term adverse impact related to use of a parcel not currently in infrastructure use or owned by the village for the central vacuum station.
5.9	Environmental Justice	No impact, but environmental justice communities would continue to be at a relatively increased risk of socioeconomic costs associated with the failure of OSWS.	Minor, short-term, adverse impacts during construction with no potential to result in disproportionately high impacts for minority or low-income populations. Potential beneficial effects for entire project area, including minority and low-income populations.	Impacts similar to Alternative 2.

Section	Area of Evaluation	Alternative 1: No Action	Alternative 2: Proposed Action: Out of District Low-Pressure	Alternative 3: Vacuum Sewer Extension
5.10	Noise	Potential minor, long-term, adverse impacts generated from pumps and other periodic clean up/repair activities.	Minor, short- and long-term, adverse construction impacts that would be in compliance with local noise ordinances.	Impacts similar to Alternative 2, with additional short-term impact due to the construction of a new central vacuum station.
5.11	Transportation	No increased impact.	Minor, short-term, adverse impact during construction in the immediate vicinity of the station during the West Avenue Pump Station upgrades. Potential for long-term, beneficial effects due to a reduction in vehicular trips associated with OSWS failure.	Impacts similar to Alternative 2, with additional short-term impacts in the location of the proposed central vacuum station.
5.12	Public Services and Utilities	Minor, adverse impact on wastewater utilities; no impact on electric utilities.	Negligible, long-term, adverse impacts on AWTF operations due to additional sewage treatment service to 648 parcels. Negligible, long-term adverse impact from incremental amount of electricity expended at each property with the addition of LPSGPS. Overall, beneficial effects on public services.	Minor, long-term, adverse impact as a result of a new central vacuum station that would require an increase in energy use for the vacuum switch, in addition to that used by pumping stations.
5.13	Public Health and Safety	Moderate, long-term, adverse impact on public health from hazards associated with OSWS failures and increased coastal flood hazards.	Negligible, short-term, adverse impacts during construction, but overall beneficial effects from minimizing the risk of discharging partially treated or untreated sewage into the area.	Impacts similar to Alternative 2, but with proportionally less beneficial effects than Alternative 2 because of the smaller reduction in pollution.

Section	Area of Evaluation	Alternative 1: No Action	Alternative 2: Proposed Action: Out of District Low-Pressure	Alternative 3: Vacuum Sewer Extension
5.14	Hazardous Materials	No impact.	Potential, negligible, short-term, adverse impact as a result of the potential to encounter hazardous materials during excavation and other ground disturbance activities.	Impacts similar to Alternative 2.
5.15	Climate Change	Minor, long-term, adverse impact on local resources from climate change and would continue the minor, long-term, adverse impact on greenhouse gas emissions.	Negligible, short-term, adverse impacts due to construction; negligible, long-term adverse impacts on greenhouse gas emissions with long-term, beneficial effects on greenhouse gas sequestration and mitigation of sea-level rise effects.	Negligible, short-term, adverse impact on climate change from construction with increased long-term impact as compared to Alternative 2 because of the additional greenhouse gas emissions associated with the new central vacuum station and its pumping operations. Overall beneficial effect on greenhouse gas sequestration and mitigation of sea-level rise effects; however, not as beneficial as those detailed under the proposed action.

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