PROJECT SUMMARY

WWTP UPGRADES

WAMPAQOAG TRIBE OF GAY HEAD (AQUINNAH)
DUKES COUNTY, MASSACHUSETTS

PUBLIC LAW 86-121

PROJECT NS-18-RM8

AUGUST 2018

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NASHVILLE AREA OFFICE

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(Acting) Director, Division of Sanitation Facilities Construction

3-Aug-2018
Date

3-August-2018
Date

3AUG2018
Date
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1.0 Introduction

The Housing Authority Director of the Wampanoag Tribe of Gay Head (Aquinnah), submitted a Project Priority Request (Appendix A) Dated January 18, 2018 requesting assistance under Public Law 86-121 from the Indian Health Service (IHS). This Project Summary proposes a project to serve thirty three (33) homes and 2 non-residential units of the Tribe with upgrades to the wastewater treatment plant. Included by reference in Appendix B is the Preliminary Engineering Report (PER). The total cost of this project is estimated to be $582,350.00. All of the project homes are classified as HUD (H1) in accordance with IHS eligibility criteria. An estimated 90 members of the Tribe will benefit from this project upon completion.

This project, titled “WWTP Upgrades”, and designated Project NS-18-RM8, will administer $582,350.00 in IHS Regular Funds. The funds will be applied towards the implementation of upgrades to a number of systems components and control mechanisms within the wastewater treatment plant that houses the rotating biological contactors (RBC) for the Wampanoag Tribe of Gay Head (Aquinnah) wastewater system in Dukes County, Massachusetts. The total estimated cost of this project is $582,350.00.

2.0 General Information

The Wampanoag Tribe of Gay Head (Aquinnah) trust lands are located in the southwest portion of Martha's Vineyard Island in the town of Aquinnah, Massachusetts. In accordance with the 1987 Settlement Act, there are approximately 485 acres of tribal lands including approximately 160 acres of private lands and approximately 325 acres of common lands. The common lands include the Gay Head Cliffs, Herring Creek, and Lobsterville. Other land owned by the Tribe includes parcels in Christian town and Chappaquiddick, Massachusetts. The homes to be served under this project are located within the Tribe’s federally recognized Contract Health Service Delivery Area (CHSDA). The CHSDA for the Tribe consists of six counties including Dukes County, Massachusetts. Dukes County consists of the island of Martha’s Vineyard whose predominant source of income is derived from tourism. General site maps of the Tribe’s territory and service areas are included in Appendix B.

2.1 Existing Wastewater System and Infrastructure

The Tribe’s existing community wastewater system is owned and operated by the Aquinnah Wampanoag Tribal Housing Authority (AWTHA). AWTHA was created by a tribal resolution in 1988 by the Wampanoag Tribe of Gay Head (Aquinnah) Tribal Council. The wastewater system was constructed in two phases in 1995 and 1996. On November 17, 1994, a Ground Water Discharge Permit was granted by The Massachusetts Department of Environmental Protection (MADEP), Permit SE# 0-603, for the wastewater treatment system. The permit was renewed on August 2, 2000 (SE#R-603), June 28, 2007, and May 31, 2016 which is the current permit SE#3-603. This permit will need to be renewed on May 31, 2021. The permit requires treatment of the waste water to Tertiary Treatment standards and establishes limits for pH, biological oxygen demand (BOD), total suspended solids (TSS), oil and grease (OG), nitrate nitrogen, and total nitrogen. The permit also requires certain daily, monthly, quarterly, and yearly sampling and analytical requirements to monitor the effectiveness of the treatment process. Effluent flow and pH are measured daily, total phosphorus and orthophosphate are measured quarterly, and volatile organic compounds (VOCs) are measured yearly.

The Primary Treatment of the sewage is accomplished using a 16,000-gallon Pretreatment Tank. Primary Treatment removes solid material from the waste water in the form of settleable or floatable solids, suspended solids, and colloidal solids. The effluent from the Primary Treatment...
process exerts a biological oxygen demand (BOD) consisting of soluble organic matter (SOM) and total suspended solids (TSS); this effluent is the influent to the Secondary Treatment Process following Primary Treatment, the flow progresses by gravity into an 8,000-gallon Equalization Tank where it is pumped to the Secondary process. The Secondary Treatment process for the waste water treatment system uses one Rotating Biological Contactor (RBC). In the Secondary Treatment course, biological processes remove the SOM. Organic nitrogen and inorganic ammonia convert to nitrate in this Secondary Treatment process as well; this is the first stage of nitrogen removal from the wastewater.

Following the RBC is another smaller anoxic RBC for Tertiary Treatment. Following this smaller RBC are the Secondary Clarifiers that remove TSS from the waste stream. The suspended solids are the biomass from the RBC media that is sloughed off from the RBC media. The removal of TSS is necessary prior to the waste stream going onto the Rapid Sand Filters.

The Rapid Sand Filters provide polishing by removing suspended solids passing through the Clarifiers. Flow then passes from the filters through a V-Notch Weir. The treated effluent then goes to a Re-aeration Chamber then to a Dosing Chamber which distributes the flow to a ground water Disposal System. The ground water Disposal System consists of two Leaching Trench Systems where the treated effluent from the waste water treatment system percolates into the surrounding ground water aquifer also known as the Soil Absorption System (SAS).

2.2 Operation and Maintenance

The AWTHA supports and is responsible for the operation and maintenance (O&M) of the existing community wastewater system. The AWTHA charges a flat rate of $0.02 per gallon for wastewater service based on the metered water usage. The Tribe currently employs one MADEP certified Grade 7 wastewater operator. The MADEP considers a grade 7 operator the highest grade operator for wastewater treatment plants. This level of operator shall have passed a Grade 6 examination and possess at least eight years of experience at a level of responsibility comparable to that of a Class 6 plant or higher. The wastewater treatment plant is classified by the MADEP as a grade 4M plant. A Grade 4M plant is a municipal wastewater treatment facility with some complexity within the treatment process. For instance, MADEP class of facilities are established by summing all rating criteria values reflecting the complexity of operation for the units within the present facility as set forth in the Rating Values for Classifications of Facilities within 257 CMR 02.

3.0 Need for the Project

In June 2015, an inspection by the MADEP reported the need to pump the tank, service the pumps in the tank, maintenance needed for the clarifier, and the methanol pumps may be larger than needed. The current Ground water Discharge Permit (issued in May 2016) requirements are for Tertiary Treatment to meet the nutrient discharge concentrations for nitrogen. For discharges to Class I ground water, which applies to this facility, the MADEP technology standard is Tertiary Treatment.

The project will provide needed upgrades to a number of ageing components of the treatment system and bring the system into regulatory requirements of the ground water discharge permit. Much of the treatment process relies on moving mechanical parts. After the useful life of these system mechanical elements they have wear damage that cannot be corrected through regular maintenance. There are also components that are needed to bring the processes to a point were instrumentation technology can have a

NS-18-RM8 Project Summary
significant positive impact with reporting criteria such as flow, water quality, and pump run times. The design is centered on the upgrade of the SCADA system where many of the mechanical processes can be automated along with providing the means to record data throughout the treatment process and provide for wireless notification of trouble or failures. Site work required to accomplish the upgrades would include but is not limited to pump replacements, upgrades in areas of flow measurement, back-up power, and replacing weathered and worn out equipment.

4.0 Proposed Project

The homes to be served by this IHS funded project are HUD (HI) with a documented sanitation deficiency as reported by IHS and the Tribe.

IHS funded the HI homes because they clearly did not create or contribute to the sanitation deficiency when they were built, the existing facilities constructed for the HUD homes in 1994 have exceeded the design life of the facilities, lack of maintenance could not be contributed to the deterioration of the facilities. This project improves sanitation systems, thereby improving health, an IHS goal.

4.1 Recommended Wastewater Facilities

Under the proposed project, the thirty-Three (33) existing wastewater system customers will be better served through the upgrade and the replacement of a number of “wear” items as mentioned in the “Need for the Project” section and the upgrade of the motor control/PLC system.

4.2 Training, Operation and Maintenance

The AWTSA employs a State licensed operator to operate and maintain the community wastewater system. All operators are required to maintain their certifications in good standing throughout their employment. At the completion of this project, there is no anticipation that this project will add to the operation & maintenance of the system or add complexity to maintaining the RBC. This project will extend the useful life of the RBC and the supporting components as well as provide improvements resulting in better quality control with flow, effluent, and overall operations. As an example, installing influent flow meters provides a mechanism where operators will be able to monitor and record effluent flows into and out of the plant with continuous monitoring. Updating the treatment plant’s heating system will regulate the heat within the plant in the winter months to maintain the temperatures inside the plant above the 55-degrees mark for efficient plant operations. Tying these two examples together with a SCADA system will provide the Tribe with a system were remote monitoring can be achieved as well as more efficient notification of problems rather than relying on homeowners for notification when alarms and lights go off during afterhours.
4.3 Schedule Of Homes To Be Served

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5.0 Project Management Plan

5.1 Stakeholders

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5.2 Procurement Plan

Tribal MOA Procurement

5.3 Design Plan

- Environmental Review and Determination – IHS
- Preparation of Records – Tribe, IHS
- Review of Engineering Design – IHS
- As-built Drawings – IHS
- Final Report – IHS

5.4 Inspection Plan

- Milestone Project Reviews – IHS, Tribe
- Final acceptance of facilities – IHS, Tribe

5.5 Change of Scope Control Plan

Any significant deviations from the path laid out in this Project Summary will necessitate an amendment be executed to this document. Changes in funding, responsibilities of the parties, or the procurement method will also require the execution of an amendment to the Memorandum of Agreement for this project.

5.6 Project Milestone Schedule

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The expected duration of this project, from the date the Memorandum of Agreement is executed to the date construction is completed, is projected to be 3.003 years.

6.0 Environmental Review

A review of the possible effects on the environment, as required by the National Environmental Policy Act (NEPA) and related environmental legislation, executive orders, and regulations, will be completed for this project. IHS will be responsible to see that the project meets the criteria for NEPA categorical exclusions as submitted to the Council on Environmental Quality. Further, the requirements of related legislation, executive orders, and regulations will be met. However, if any condition contrary to the results of this review is discovered at any time during the course of this project, further action will be taken to ensure that this project causes no significant impact on the environment.
# 7.0 Budget

## 7.1 Detailed Cost Estimate

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**SURTOTAL SECTION I.** $441,170.00
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<td>Construction Contingencies</td>
<td>15.0% of $441,170.00 = $66,180.00</td>
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<tr>
<td>TOTAL SECTION I:</td>
<td>$ 507,350.00</td>
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<tr>
<td>TOTAL SECTION I: (ROUNDED)</td>
<td>$ 507,350.00</td>
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</tbody>
</table>

**II. TRIBAL PROJECT SUPPORT**

*Tribal Support Costs*  
TOTAL SECTION II: $12,648.00  
TOTAL SECTION II: (ROUNDED) $12,600.00

**III. IHS PROJECT SUPPORT**

**IHS Technical Support**  
TOTAL SECTION III: $62,388.00  
TOTAL SECTION III: (ROUNDED) $62,400.00

**IV. SUMMARY**

Total Funds from IHS for Planning and Construction (I): $507,350.00  
Total Funds for Tribal MOA Procurement Support (II): $12,600.00  
Total Funds Retained by IHS for Project Technical Support (III): $62,400.00  
Total Project: $582,350.00

TOTAL PROJECT ESTIMATE (ROUNDED TO NEAREST TENS) $582,350.00

Unit Cost/Home Served (ROUNDED): 33 Homes $17,647.00

*Note: The Tribal Support Costs amount is a variable rate calculated as per MOA guidelines (January 2003) ch. VI, pg. 15.

**Note: The IHS Technical Support amount will be retained by IHS and used to provide technician related direct support for this project. Support related tasks primarily include personnel and travel costs for site evaluations, drafting, surveys, and construction inspection.
7.2 Funding Source(s)

IHS Regular Funds = $582,350.00
Total Funds Dedicated To the Project = $582,350.00
APPENDIX A

Project Priority Request
January 18, 2018

LCDR Charles Thompson
Senior Field Engineer
Indian Health Service, Mashpee Service Unit
483 Great Neck Road South / Suite B5
Mashpee, MA 02649

Listed below is the Wampanoag Tribe of Gay Head Aquinnah Sanitation Deficiency Systems Priorities for fiscal year 2018.

1. The Wastewater Treatment plant was put into service in 1994 - 1995. Since then the plant has not had any major upgrades. As noted in the 2010 Wastewater Treatment System Evaluation a number of items are reaching their life expectancy. There are a number of items needing to be addressed, to name a few, determination the status of the pumps and valves, replacing the existing PLC hardware, providing additional instrumentation, including influent and effluent pH transmitters, a level transmitter for the equalization tank, and an influent magnetic flow meter, and wireless transmitters should be installed at all five clusters to transmit high level alarms to an Omni receiver at the WWTP where an auto dialer transmit the alarm by phone to the waste water treatment plant operator, thus not relying on residents to call in the alarm. The Indian Health Service completed a Preliminary Engineering Report in 2016 to support this project.

2. Provide for drinking water pressure tank seal coating to prevent bleeding of rust into water.

Please contact our Housing Administrator, Willard Marden for further information pertaining to these projects.

Sincerely,

Chairwoman Cheryl Andrews-Maltais
Wampanoag Tribe of Gay Head Aquinnah

cc: Willard Marden, Housing Administrator
APPENDIX B

Preliminary Engineering Report (PER)
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Figure 5  Infrastructure Location-Layout Map
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Figure 7  Composite Map
Figure 8  Composite Map
EXECUTIVE SUMMARY

In 1994 and 1995, the Aquinnah Wampanoag Tribal Housing (AWTHA) development was designed, permitted, and built. The project included a Waste Water Treatment System (WWTS) consisting of a community collection system, a community treatment system, and a community disposal system. This community system serves 30 residential dwelling units and 3 non-residential units of the Tribe.

In June 2007, a Ground Water Discharge Permit was renewed from the original application made in 1994. The current permit number is SE#2-603. In November 2005, the Massachusetts Department of Environmental Protection (MADEP) issued a sewer extension permit to the Ground Water Discharge Permit, allowing 650 feet of 8" sewer to convey 2,000 gallons per day (gpd) from the Community Center off Black Brook Road to the waste water treatment plant.

The technical components of the discharge permit regulate the quantity and quality of treated waste water to the ground water. The permit requires waste water be treated to tertiary treatment standards and established limits for constituents of the wastewater. Besides the tertiary treatment standards the permit requires daily, monthly, quarterly, and yearly sampling and analytical requirements monitoring the effectiveness of the treatment process.

The facilities have a number of recommended upgrades: replace the series 200 pumps with the extreme series pumps within the collection system, install wireless transmitters at the lift stations to transmit high level alarms to an Omni receiver at the WWTP, pump the 16,000 gallon pretreatment tank, raise the pretreatment tank bilco hatch and manholes and slope the grade away from these openings preventing rain water and runoff from entering, replace the Flow Equalization Tank (FET) pumps; replacing them with smaller pumps, replace the valves in the FET, upgrade the vent system for the RBC tank, replace the air solenoid valves in the clarifier, provide for a rebuild or replacement of the secondary clarifier, determine how to automate the backwash cycle of the denitrification filter, upgrade the PLC components and software to accommodate control/telemetry hardware upgrades, and flow measuring equipment. A component of system upgrades would include installing PLC components to record flow equalization accurately, monitoring influent and effluent pH, equalization tank level, and control of influent flows.

INTRODUCTION

In 1994 and 1995, the Aquinnah Wampanoag Tribal Housing development was designed, permitted, and built. The project included a Waste Water Treatment System (WWTS) consisting of a collection system, a treatment system, and a disposal system. The Aquinnah Wampanoag Tribal Housing Authority (AWTHA) is the project owner for the WWTS, which is located on land owned by The Wampanoag Tribe of Gay Head (Aquinnah).

On November 17, 1994, a Ground Water Discharge Permit was granted by The Massachusetts Department of Environmental Protection (MADEP), Permit SE #0-603, for the waste water treatment system. The permit was renewed on August 2, 2000 (SE #i-603), and again on June 28, 2007 (SE #2-603) which is the current permit. On November 8, 2005, MADEP issued a sewer
extension permit to the Ground Water Discharge Permit, allowing 650 feet of 8" sewer to convey 2,000 gallons per day (gpd) from the Community Center off Black Brook Road to the waste water treatment plant.

The technical components of the discharge permit restrict the quantity and quality of treated waste water to the ground water. The permit requires treatment of the waste water to tertiary treatment standards and establishes limits for pH, biological oxygen demand (BOD), total suspended solids (TSS), oil and grease (OG), nitrate nitrogen, and total nitrogen. The permit also requires certain daily, monthly, quarterly, and yearly sampling and analytical requirements to monitor the effectiveness of the treatment process. Effluent flow and pH are measured daily, total phosphorous and orthophosphate are measured quarterly, and volatile organic compounds (VOCs) are measured yearly.

The preliminary design objective is to meet the regulations and standards of the MADEP permit for ground water discharge; before the facilities require emergency repair or are taken offline due to a major component failure. The scope of work mainly encompasses upgrades to support the operator in the daily, weekly, and yearly monitoring schedule that has been set forth in the permit. A portion of the upgrades would include new PLC components and software, wireless component to notify the operator of high level alarms rather than relying the community at large for notifications, Flow Equalization Tank (FET) pumping to remove solids and scum buildup, replace the pumps in the FET, raise the pretreatment tank bilco hatch and sloping away the grade preventing runoff from flowing into the tank, rebuilding or replacement of the clarifier, and provide for general mechanical replacements for the Rotating Biological Collector (RBC) such as chains, bearings, motors, and drives.

This project will serve a community of thirty (30) homes and 3 non-residential units of the Tribe. The Tribe’s perspective is these are needed upgrades in order to meet the regulatory requirements of the MADEP ground water discharge permit.

1.0 PROJECT PLANNING

The area being considered under this project is limited to the wastewater facilities located on the reservation. The rebuilding of the central components of the waste water treatment plant would not necessarily facilitate the need for open construction, rather the components of the upgrade would be simply rebuilt or replaced. Noting this also eludes to the National Environmental Protection Act, this project does not propose any new excavation rather replacement of existing equipment that has deteriorated sewage treatment plant components not correctable by routine maintenance causing operational problems. The deterioration of the facilities will ultimately lead to non-compliance of the regulatory requirements of permit SE#2-603

a) Location. The AWTHA development is located on approximately 102 acres in the southwestern portion of Martha's Vineyard Island, just south of State Road, approximately three miles east of the Aquinnah Cliffs Light House in The Town of Aquinnah (Gay Head), MA. Figure 1 is a USGS map showing the site location in the south central part of Aquinnah, Figure 2 is a map of Tribal Lands.

Figure 3 is a map of the site. This map shows the general surrounding land uses. The
Community Center, the tribal offices, and the housing units are shown in this figure. The housing is arranged in clusters, namely Cluster B through Cluster G. Except for Cluster B which is Elderly Housing consisting of three duplex units, all the other housing is single family housing.

b) **Environmental Resources Present.** The Vineyard has an abundant supply of clean groundwater that greatly exceeds the present-day and projected drinking water needs. Surface waters ring the perimeter of the Island and include fragile great ponds, fed by streams in the Western Moraine and cut off from the sea by barrier beaches. Tidal ponds are important sources of shellfish and finfish and provide significant aesthetic and recreational value, supporting the Island’s tourism industry. Both groundwater and surface waters are susceptible to pollutants that can threaten the health of these systems and the community.

c) **Population Trends.** The housing development is not age restricted. There is, however, an Elderly Housing component (Cluster B) added after the original housing units. The development consists of twenty-seven (27) single family homes, three (3) duplex Elderly Housing (6 units), 1 administration building, 1 maintenance shop and garage, and the waste water treatment building.

The original design for the development was for twenty-five (25) 3-bedroom houses, five (5) 4-bedroom houses, a 1,200 sf of administrative building, and future flow from 40 additional bedrooms.

The current population associated with the development is less than 100 people, approximately 90 residents currently reside in the units. This represents approximately 3.0 people per unit. Every unit is occupied as of the development of this PER.

There is no future development currently proposed for this site. Therefore, the total population is not expected to increase in the near future.

2.0 **EXISTING FACILITIES**

2.1 **EXISTING FACILITIES - WATER SYSTEM**

No water facilities are considered under this PER.

The Town of Aquinnah does not have a public water system. The source of the water supply for the AWTHA development is from four gravel packed wells at three locations on the northerly upslope side of the site. The Indian Health Service (IHS) designed the water supply system for the development. Wells IIBNE and IIBNW are very close together and located about 75' east of the pump house. Well IIBNW is located further east approximately 675' from the pump house. The fourth well IIANE is located further east and north about 150' from well IIANW.

a) **Location Map.** The AWTHA development has water services to each housing unit. Figure 4 provides details of the infrastructure in and around the development site. The Tribe’s community water system serves twenty-seven (27) single family detached homes,
three (3) duplex units for elderly residents, the Housing Authority office, and the wastewater treatment plant. The entire water treatment and distribution system as well as its client homes are located on the Wampanoag Interior Lands within the tribe’s federally recognized Contract Health Service Delivery Area (CHSDA).

b) **History.** The system was constructed in two phases in 1995 and 1996. The water distribution system (PWS # 010-30-7001) consists of four (4) independent wells. They are located in close proximity to the existing 20' x 28' water treatment building. These are relatively shallow sand and gravel wells within an unconsolidated aquifer. Each well enters the water treatment building separately and has a separate plumbing tree in the mechanical room. The four plumbing trees manifold together prior to entering the chemical room. The Water system has chemical treatment which consists of fluoride addition and corrosion control. The treatment system is contained in their pump house, which also contains the system controls. The pump house is generally well maintained and clean.

Fluoride and potassium hydroxide (KOH) are stored in separate areas of the same room. This separation is good and should be maintained, as the chemicals are not compatible. When reviewing the chemicals, we could not find an NSF certification on the KOH. We found the certification marked on the Fluoride containers.

c) **Condition of Existing Facilities.** The distribution system pressure is maintained at 50 - 55 psi. Reports indicate the AWTHA has an annual flushing and valve-turning program. The present condition of the water distribution and treatment system is satisfactory. Satisfactory meaning the system is well maintained, logs are kept relatively up to date. The operator maintains his certification through meeting the requirements of certification i.e. yearly CEU accomplishment. A recent 2015 Sanitary Survey by the Environmental Protection Agency found no significant deficiencies resulting in unsuitability for continued use of the system. The sources are four groundwater wells. Each of the wells function favorably and produce enough water to meet daily demands. Additionally, the water system is comprised of approximately 5,220 LF of 8-inch PVC water main, 50 LF of 4-inch ductile iron water main, 2,535 LF of 3-inch PVC water main, 200 LF of 2-inch PE water main, (2) 4-inch and (15) 8-inch gate valves, and 12 flush hydrants. Two 2,540-gallon captive air hydro-pneumatic tanks provide hydraulic pressure and limited storage for the water system. The average daily consumption for the system is about 3,000 gallons per day (gpd).

An inspection of the pressure tanks in 2016 provided information the tanks will need to be recoated inside the tank, the tank walls have practically the same thickness as when the tanks were installed, and overall these tanks have been maintained well. There have been no major component failures. However, the water treatment existing control panel has been plagued by repeated service calls. The control panel has not been adequate to balance flow of water from the wells with the level of pressure required to answer the demand. The result has been that the water system has become air-locked on several occasions creating hazards to tribal members when the air self-ventilates through household fixtures.
2.2 **EXISTING FACILITIES - WASTEWATER SYSTEM**

a) **Location Map.** The AWTHA development site has wastewater services to each housing unit. Figure 4 provides details of the infrastructure in and around the development site. The Tribe's community wastewater system serves twenty-seven (27) single family detached homes, three (3) duplex units for elderly residents, the Housing Authority office, and the wastewater treatment plant. The entire water treatment and distribution system as well as its client homes are located on the Wampanoag Interior Lands within the tribe's federally recognized Contract Health Service Delivery Area (CHSDA).

b) **History.** The system was constructed in two phases in 1995 and 1996. On November 17, 1994, a Ground Water Discharge Permit was granted by The Massachusetts Department of Environmental Protection (MADEP), Permit SE# 0-603, for the wastewater treatment system. The permit was renewed on August 2, 2000 (SE#1-603), and again on June 28, 2007 which is the current permit SE#2-603. On November 8, 2005, MADEP issued a sewer extension permit to the Ground water Discharge Permit, allowing 650 feet of 8" sewer to convey 2,000 gpd from a proposed Community Center off Black Brook Road to the wastewater treatment plant. The technical components of the discharge permit restrict the quantity and quality of treated waste water to the ground water. The permit requires treatment of the waste water to Tertiary Treatment standards and establishes limits for pH, biological oxygen demand (BOD), total suspended solids (TSS), oil and grease (OG), nitrate nitrogen, and total nitrogen. The permit also requires certain daily, monthly, quarterly, and yearly sampling and analytical requirements to monitor the effectiveness of the treatment process. Effluent flow and pH are measured daily, total phosphorous and orthophosphate are measured quarterly, and volatile organic compounds (VOCs) are measured yearly.

The Primary Treatment of the sewage is accomplished using a 16,000-gallon Pretreatment Tank. Primary Treatment removes solid material from the waste water in the form of settleable or floatable solids, suspended solids, and colloidal solids. The processes involved are primarily physical processes that allow gravity to remove the solids by either settling or flotation. Flocculation and coagulation conglomerate colloidal and suspended particles into larger solids that then settle or float (oil and grease). Sludge is the term used for settled solids, and scum is the term used for floatable solids. The effluent from the Primary Treatment process exerts a biological oxygen demand (BOD) consisting of soluble organic matter (SOM) and suspended solids (TSS); this effluent is the influent to the Secondary Treatment Process.

Following Primary Treatment, the flow progresses by gravity into an 8,000-gallon Equalization Tank where it is pumped to the Secondary process. A consistent flow rate with moderate variability is very important to Secondary and Tertiary Treatment process. The Secondary Treatment process for the existing waste water treatment system uses one Rotating Biological Contactors (RBC). Secondary Treatment removes SOM that exerts the oxygen demand, which depletes oxygen from ground water and surface water when waste water is discharged to them. Oxygen depletion severely degrades the water and kills most forms of biota and animal life. The oxygen demand comes from naturally
occurring bacteria and other microbial life in the soils and water that use oxygen to consume the SOM. Biological processes remove the SOM in the Secondary Treatment Process. Organic nitrogen and inorganic ammonia convert to nitrate in this Secondary Treatment process as well; this is the first stage of nitrogen removal from the wastewater.

Following the RBC is another smaller anoxic RBC for Tertiary Treatment. Following this RBC is a Secondary Clarifiers that removes TSS from the waste stream. The suspended solids are the biomass from the RBCs that sloughed off from the RBC media. The removal of TSS is necessary prior to the waste stream going onto the Rapid Sand Filters.

The Rapid Sand Filters provide polishing by removing suspended solids passing through the Clarifiers. Flow then passes from the filters through a V-Notch Weir for flow metering. The treated effluent then goes to a Re-aeration Chamber then to a Dosing Chamber which distributes the flow to a ground water Disposal System. The ground water Disposal System consists of two Leaching Trench Systems where the treated effluent from the waste water treatment system percolates into the surrounding ground water aquifer. This is the Soil Absorption System (SAS).

The permit issued by MADEP for this facility does not currently require Financial Security in the form of a Repair/Replacement Account and a Capital Reserve Account or Engineering and Financial Plan Reports. As part of the regular permitting process, there are certain supplemental conditions that typically include requirements for financial security, operator qualifications, septage disposal, qualified laboratories, and requirements for certain reports. An Engineering Report and Financial plan are required to be submitted at year 15, simultaneously with the third permit renewal. The Engineering Report is to evaluate what requirements if any to continue to meet the permit requirements through year 20 and beyond. The Financial Plan contains cost estimates for the work identified in the Engineering Report and how and when the costs will be financed.

c) Condition of Existing Facilities. Wastewater from the majority of the buildings in the community is collected into a community collection sewer system. The wastewater system consisted of approximately 2,000 feet of 8-inch PVC gravity sewer main, 3,260 feet of 1½- and 2-inch high density polyethylene sewer force main, 6 duplex grinder pump stations, 22 manholes, and one wastewater treatment plant. The treatment facility includes a rotating biological contactor. Discharge from the plant is disposed in a large subsurface disposal field located adjacent to the south side of the plant. The Tribe has consistently been in compliance with the terms of the State of Massachusetts Department of Environmental Protection permit for the discharge.

3.0 NEED FOR PROJECT

a) Health, Sanitation, and Security. A recent inspection by the MADEP reports the need to pump the tank, service the pumps in the tank, maintenance needed for the clarifier, and the methanol pumps may be larger than needed. This report is labeled Figure 5. The treatment plant has functioned well over the last 20 years. The Tribe has maintained the
system very well with the limited resources they have. Many of the components of the system are at the design life.

b) Aging Infrastructure. The current Ground water Discharge Permit (issued in June 2008) requirements are for Tertiary Treatment to meet the nutrient discharge concentrations for nitrogen. Tertiary treatment is a three stage treatment process that includes:

1) The removal of solids (Primary Treatment);
2) The removal of suspended solids (TSS) and the removal of five day Biochemical Oxygen Demand, BOD (Secondary Treatment)
3) The removal of nutrients, in this case nitrogen (Tertiary Treatment).

For discharges to Class I ground water, which applies to this facility, the MADEP technology standard is Tertiary Treatment. The Primary Treatment technology standard is removal of:

1) >25% of the five day BOD
2) >55% of total suspended solids (TSS)
3) >85% of the floating and settleable solids

The MADEP technology standard for Secondary Treatment is:
1) >85% removal of five day BOD
2) >85% of TSS
3) Removal of all floating and settleable solids.

For the current permit, the stipulated quantitative water quality and technology based discharge limits are:

1) Flow 15,000 gpd
2) Oil & Grease 15 mg/l
3) Total Suspended Solids 30 mg/l
   > 85% Removal
4) Biochemical Oxygen Demand 30 mg/l
   > 85% Removal
5) Total Nitrogen (N02+N03+TKN) 10 mg/l
6) Nitrate Nitrogen 10 mg/l
7) pH 6.5 to 8.5
   ± 0.2 unit– from Background pH

The MADEP measures the 85% as a combination of BOD and TSS. The influent value of (BOD + TSS) minus the effluent value of (BOD+ TSS), the amount removed in the process, must be greater than 85% of the influent value. The qualitative discharge limits will ensure that the effluent will not result in any demonstrable adverse effect on the ground water or violate any water quality standard promulgated.

c) Reasonable Growth. There is no near term or foreseeable future plan to expand the waste water system which is running well below its capacity. The current flow through the plant is about 20% of the permitted flow rate of 15,000 gpd. The waste water process equipment is sized for 25,000 gpd, so the current flow is about 12% of the equipment’s capacity.

4.0 ALTERNATIVES CONSIDERED

A “Do Nothing” Alternative would likely leave the plant not being able to meet the regulatory requirements of MADEP, therefore leaving the Tribe without an approved ground water discharge permit.
The plant functions well and is in need of some upgrades to the operating components of the system. The performance of the plant is evident by meeting the MADEP permit regulations.

a) **Environmental Impacts.** Unless the proposed component upgrades to the plant disturb wetlands, there ought to be no requirement for the filing of an Environmental Notification Form (ENF) under 301 CMR 11.00 or the filing of an Environmental Impact Report (EIR).

b) **Land Requirements.** This project is on tribal trust land, no significant land requirement or easements will be needed.

c) **Potential Construction Problems.** The potential problems that may play a part in upgrading the system would be system operation. The system will need to operate at capacity and performance to meet the MADEP regulatory requirements. A suitable workaround can be developed with consultation of MADEP while construction/upgrades are being applied.

d) **Cost Estimates.** The cost estimate has included costs for upgrade of PLC components and software needed for the upgrading of the control/telemetry hardware for such items such as the Omni Antenna, remote alarm monitoring and reporting via text or fax by each component, data logging of operating conditions, and influent flow rate and proportional-integral-derivative (PID).

### PROJECT COST ESTIMATE

**Wampanoag of Gay Head WWTP Upgrades**

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<th>Item Description</th>
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<th>Unit</th>
<th>Unit Cost</th>
<th>Total Cost</th>
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<td>$67,500.00</td>
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<td>EA</td>
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<td>$6,000.00</td>
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<td>$250.00</td>
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<td>Install wireless transmitters</td>
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<td>EA</td>
<td>$1,300.00</td>
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<td>6</td>
<td>Install Omni antenna at WWTP</td>
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<td>20</td>
<td>WWTP Heating</td>
<td>1</td>
<td>EA</td>
<td>$14,250.00</td>
<td>$14,250.00</td>
</tr>
<tr>
<td>21</td>
<td>WWTP Process Room Sinks and Cabinets</td>
<td>1</td>
<td>EA</td>
<td>$7,500.00</td>
<td>$7,500.00</td>
</tr>
<tr>
<td>22</td>
<td>WWTP Methanol Room</td>
<td>1</td>
<td>EA</td>
<td>$3,500.00</td>
<td>$3,500.00</td>
</tr>
<tr>
<td>23</td>
<td>WWTP Bath Room</td>
<td>1</td>
<td>EA</td>
<td>$3,750.00</td>
<td>$3,750.00</td>
</tr>
</tbody>
</table>
24  WWTP Control Room  1  EA  $46,000.00  $46,000.00  
25  75 kw generator  1  EA  $56,250.00  $56,250.00  
26  Replace 2HP pumps  2  EA  $2,500.00  $5,000.00  
27  Replace valves  6  EA  $850.00  $3,900.00  
28  Replace air Sparge - Effluent Disposal System  1  EA  $2,750.00  $2,750.00  
29  Replace local electrical disconnect  1  EA  $4,500.00  $4,500.00  
30  Septage pumping of the 16,000 Gal Tank  2  EA  $3,500.00  $7,000.00  

Total Construction Cost = $362,150.00  
Contingencies 15% = $54,322.50  
Subtotal Construction Costs = $416,472.50  
18% Project Technical Support = $74,965.05  
Total Project Cost (Rounded) = $492,000.00  

e) Life Cycle Costs. A life cycle present worth cost analysis should be completed for each technically feasible alternative. Do not leave out alternatives because of anticipated costs; let the life cycle cost analysis show whether an alternative may have an acceptable cost. Several analyses may be required if the project has different aspects, such as one analysis for different types of collection systems and another for different types of treatment.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Initial Costs</th>
<th>Maintenance and Repair Costs (Annual)</th>
<th>Life Cycle Cost</th>
<th>Design Life</th>
<th>Discount Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$39,000</td>
<td>$1,085,899</td>
<td>20 Years</td>
<td>3.20%</td>
</tr>
</tbody>
</table>

These costs compare estimated O&M and repair costs for the WWTP and valves being maintained, accounting for the O&M of the entire system. Unaccounted costs include costs of ferrying replacement parts to and from Martha’s Vineyard.

f) Capacity of Tribe to Operate and Maintain the Alternative. The complexity of the upgrades would actually be an improvement to the system and add to operator productivity. The upgrades would allow the operator to have better control of the plant, provide detailed treatment plant data to the MADEP. The upgrades would provide the means for collecting and retrieving data to develop trending reports that would include plant flows, effluent constituency, and pump run times.

Many of the upgrades include pump replacements, upgrades in areas of flow measurement, back-up power, and replacing weathered equipment. A number of the upgrades such as pump replacement will allow the tribe to bring operating costs down with sizing the appropriate pumps for the flow rates currently flowing through the plant. Other improvements would provide for better quality control within the plant. For instance, installing influent flow meters provide a mechanism where operators will be able to have the flows monitored continuously. Updating the treatment plants heating system will regulate the heat within the plant in the winter months to maintain the temperature...
inside the plant above the 55-degrees mark for plant operations. These improvements would not add to the complexity of plant operations, but would enhance plant operations by providing the operator with tools to assist in the proper operations of the plant.

5.0 PROPOSED PROJECT

For the proposed project, a number of upgrades to the treatment process are recommended.

a) Preliminary Project Design.

Preliminary project design is credited to the age of the components of the treatment system and the regulatory requirements of the ground water discharge permit. Much of the treatment process relies on moving mechanical parts. After the useful life of these system mechanical elements they will have wear damage that cannot be corrected through regular maintenance. This leads to inefficiency of the plant increasing operational costs. There are also components that are needed to bring the processes to a point were instrumentation technology can have a significant positive impact with reporting criteria such as flow, water quality, and pump run times. The design is centered on the upgrade of the SCADA system where many of the mechanical processes can be automated along with providing the means to record data throughout the treatment process. The discharge permit does require reporting of discharges, water quality and flow into the plant. The required site work would include but not limited to pump replacements, upgrades in areas of flow measurement, back-up power, and replacing weathered equipment. These and other improvements would provide for better quality control with flow, effluent, and overall operations. For instance, installing influent flow meters provide a mechanism where operators will be able to have the flows into and out of the plant monitored continuously. Updating the treatment plants heating system will regulate the heat within the plant in the winter months to maintain the temperature inside the plant above the 55-degrees mark for efficient plant operations. Tying these two examples together with a SCADA system will provide the Tribe with a system were remote monitoring can be achieved as well as more efficient notification of problems rather than relying on homeowners for notification.

i) Drinking Water:

Not Applicable

ii) Wastewater:

Collection System Layout. The community wastewater system serves twenty-seven (27) single family detached homes, three (3) duplex units for elderly residents, Housing Authority office, and wastewater treatment plant. Wastewater from the majority of the buildings in the community is tied to a community collection system consisting of approximately 2,000 feet of 8-inch PVC gravity sewer main, 3,260 feet of 1 1/2- and 2-inch high density polyethylene sewer force main, 6 duplex grinder pump stations, 22 manholes, and one wastewater treatment plant. The treatment facility includes a rotating biological contactor. Discharge from the plant is disposed in a large subsurface disposal field located adjacent to the south side of the plant. The Tribe has consistently been in compliance with the terms of the State of Massachusetts Department of Environmental Protection permit for discharge. The
The entire system is located on the Wampanoag Interior Lands described above, Figures 6 & 7 provide an overview of the site and the location of infrastructure.

**Pumping Stations.** For this rehabilitation project, the components being upgraded include the four series 200 eOne pumps to the Extreme Pumps, a wireless system to notify operator of lift station high water alarms, replace the control boxes at each station, replacing covers to the eOne systems in each of the housing clusters; pumping and cleaning of the 16,000 gallon pretreatment tank, raising the elevations of the bilco hatch and manholes to allow storm water to be directed away from the tank; replace the PET pumps with appropriately sized pumps for this application, replace the associated valves, upgrade the float system with pressure transducers, provide for influent meters that provide for flow monitoring to meet MADEP regulations; replaced the Anoxic RBC chain that drives the unit; Aerobic RBC upgrades include the motors and pumps that provide the air into the aerobic section of treatment, install new solenoids of the aerobic RBC; the 10-ft Secondary Clarifier upgrades would include drive shaft motor, gear box, rake, air solenoid valves, and the Clarifier ought to be thoroughly cleaned and painted; the Denitrification Filter ought to have an ultrasonic flow meter to measure flow through the process that remove solids; upgrade the PLC unit as many of the components are outdated and new components are not readily available, replace the disconnect for these pumps with a NEMA 3R housing and add HOA provisions.

**Storage.** The Pretreatment Tank consists of one 16,000-gallon tank which meets MADEP guidance document requirements. The design flow rate is 14,940 gpd. The influent Pretreatment Tank handles flow from a collection system that uses grinder pumps and does include sludge wasting from the Secondary Clarifiers.

**Treatment.** The existing waste water treatment system consists of a conventional, sequential Primary, and Secondary process train. The Secondary Treatment process is fixed-media activated sludge system. Tertiary Treatment is accomplished by a fixed media denitrifying system followed by a clarifier and sand filter, with final disposal using a re-aeration chamber, a dosing chamber, and a leaching trench Soil Absorption System (SAS).

Primary Treatment of the sewage is accomplished using a 16,000-gallon Pretreatment Tank. Primary Treatment removes solids from the waste water in the form of a settleable or floatable solids, suspended solids, and colloidal solids. The processes involved are physical processes that allow gravity to remove the solids by either settling or floatation. Flocculation and coagulation conglomerate colloidal and suspended particles into larger solids that then settle or float (oil and grease). Sludge is the term used for settled solids, and scum is the term used for floatable solids. The effluent from the Primary Treatment process exerts a biological oxygen demand (BOD) consisting of soluble organic matter (SOM) and total suspended solids (TSS); this effluent is the influent to the Secondary Treatment Process.

Following Primary Treatment, the flow progresses by gravity into an 8,000-gallon Equalization Tank where it is pumped to the Secondary process. A consistent flow rate with moderate variability is very important to the Secondary and Tertiary Treatment process.

The Secondary Treatment process for the existing waste water treatment system uses one Rotating Biological Contactors (RBC). Secondary Treatment removes SOM that exerts the oxygen demand, which depletes oxygen from ground water and surface water when waste water is discharged to them. Oxygen depletion severely degrades the water and kills most forms of biota and microbial life. The oxygen demand
comes from naturally occurring bacteria and other microbial life in the soils and water that use oxygen to consume the SOM. Biological processes remove the SOM in the Secondary Treatment Process. Organic nitrogen and inorganic ammonia convert to nitrate in this Secondary Treatment process as well; this is the first stage of nitrogen removal from the waste water.

Following the RBC is another smaller anoxic (low oxygen) RBC for Tertiary Treatment. Following this RBC is a Secondary Clarifiers that removes TSS from the waste stream. The suspended solids are the biomass from the RBC that sloughed off from the media. The removal of TSS is necessary prior to the waste stream going onto the Rapid Sand Filters.

The Rapid Sand Filters provide polishing by physically removing suspended solids passing through the Clarifiers. Flow then passes from the filters through a V-Notch Weir for flow metering. The treated effluent then goes to a Re-aeration Chamber then to a Dosing Chamber which distributes the flow to a ground water Disposal System.

The ground water Disposal System consists of two Leaching Trench Systems where the treated effluent from the waste water treatment system percolates into the surrounding ground water aquifer. This is the Soil Absorption System (SAS).

iii) Solid Waste:
Not Applicable

iv) Stormwater:
Not Applicable

b) Project Schedule.

<table>
<thead>
<tr>
<th>Milestone Event</th>
<th>Target Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Planning Phase</td>
<td></td>
</tr>
<tr>
<td>Project Funding Received</td>
<td>1 March 2017</td>
</tr>
<tr>
<td>Project Summary Completed</td>
<td>1 June 2017</td>
</tr>
<tr>
<td>Memorandum of Agreement Executed</td>
<td>31 August 2017</td>
</tr>
<tr>
<td>Environmental Review Document Completed</td>
<td>4 September 2017</td>
</tr>
<tr>
<td>Environmental Determination Issued</td>
<td>30 November 2017</td>
</tr>
<tr>
<td>2. Design Phase</td>
<td></td>
</tr>
<tr>
<td>Construction Design Initiated</td>
<td>30 November 2017</td>
</tr>
<tr>
<td>Design Completed</td>
<td>2 April 2018</td>
</tr>
<tr>
<td>Procurement Package Completed</td>
<td>4 June 2018</td>
</tr>
<tr>
<td>Procurement Action Initiated</td>
<td>20 August 2018</td>
</tr>
<tr>
<td>3. Construction Phase</td>
<td></td>
</tr>
<tr>
<td>Construction Started</td>
<td>27 August 2018</td>
</tr>
</tbody>
</table>
c) Permit Requirements. The jurisdictional requirements is under the Massachusetts Department of Environmental Protection (MADEP) for permits. As for construction easements, all of the proposed upgrades will be on Tribal Trust land and there is no proposed construction or upgrades where excavation activities are anticipated. All upgrades are to existing equipment and there is no expectation that ground disturbing activities will be needed.

d) Annual Operating Budget

i) Annual O&M Costs There will be overall decrease in operational and maintenance costs due to elimination of emergency repair work and automation of data collection, while at the same time improving service, ease of maintenance and operability of the system through the addition of new SCADA equipment and replacement and installation of new pumps, valves, rebuilding of the clarifier, addition of pressure and level sensors, flow monitoring so the operator will no longer need to manually operate the back wash cycle on a monthly basis, installation of an Omni antenna to receive the wireless transmissions from the eOne units for high water alarms, and the other improvements that are proposed. With a reduction in work load for the utility department by automating, it is anticipated to allow the operator to perform other tasks to maintain the system quality.

e) Operation and Maintenance Needs As part of the regular permitting process, there are certain supplemental conditions typically required that include financial security, operator qualifications, septage disposal, qualified laboratories, and requirements for certain reports. The waste water treatment system for the AWTHA system requires a Ground Water Discharge Permit, because it is permitted for flow greater than 10,000 gallons per day. The permit that has been issued by MADEP for this facility and does not currently require Financial Security in the form of a Repair/Replacement Account and a Capital Reserve Account or Engineering and Financial Plan Reports. The current Ground water discharge Permit is for Tertiary Treatment. The permit requires the system to be operated by a Grade 4 Waste Water Treatment Plant Operator. The wastewater treatment plant operator in charge is adequately licensed and is able to meet system requirements. An assistant operator ought to be hired and at a minimum, obtain a Grade 3 license to fully meet MADEP permit requirements.

It is anticipated that the annual maintenance of the upgrades will require fewer hours of manpower per year since equipment will be new.

An O&M survey was conducted by IHS in 2011 yielding a score of 11 (wastewater) out of a possible 16. The survey score showed that the Tribe's O&M practices are above average and only need minor improvements. The Tribe's utilities department does have an operator with the appropriate certification level, have the operator maintaining the State of Massachusetts continuing education credits requirements, and maintain the
wastewater treatment system within the regulatory requirements of the ground water discharge permit.

O&M elements evaluated in the survey included:
- Operator certification,
- Preventive maintenance plan, schedule, and record keeping,
- Sufficient spare parts and tools inventory,
- Safety program,
- Operator education and training,
- Accurate system maps,
- Facility security,
- Regulatory compliance, and
- Budget and organization.

The Tribe owns, operates and maintains the wastewater collection and treatment system. They currently rely upon standard specifications, drawings, and appurtenances of its tribal engineering consultant and as of late the IHS Tribal Utility Consultant stationed in Mashpee, MA.

For the past 20 years the Tribe has operated this facility well. The AWTHA Director and operator both have exceptional understanding of the system. Along with the extraordinary knowledge of the system, the Director administers the operation and cost controls very well too.

f) Environmental Assessment. The jurisdiction of environmental requirements is under the Massachusetts Department of Environmental Protection (MADEP). If the plant should need to be upgraded such that wetlands disturbance is imminent, an Environmental Notification Form (ENF) under 301 CMR 11.00 or the filing of an Environmental Impact Report (EIR) will be required. The proposed upgrades in this report do not include expansion to the plant only upgrades and improvements to existing components of the system. In some cases downsizing of some items, such as pumps. The NEPA determination for this proposal will be minimal, providing the Environmental Information and Documentation likely suffice for these upgrades.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The existing RBC tertiary treatment system is acceptable to meeting the regulatory requirements of the Ground Water Discharge Permit issued by MADEP. A number of system improvements have been appraised in the development of the upgrade options. The listed items such as SCADA controls, the wireless transmitters with Omni receiver, pump replacement, flow metering, Clarifier rebuild, aerobic RBC air lift pumps, and the many other items are considered a very high priority for the Tribe to maintain the operation of the plant. The plant has been in operation since 1995 meeting the MADEP permit regulations. With the exception of one incident were the sand filtration media was replaced through an emergency project, NS-12-E15, the plant has been maintained and operated exceptionally well. The proposed improvements to the treatment system will allow the Tribe to meet the present and future requirements of the MADEP Ground Water Discharge Permit.
Figure 1 - USGS Location Map
Figure 2 - Aquinnah Wampanoag Tribal Lands Map
Figure 4 - Infrastructure Location-Layout Map
<table>
<thead>
<tr>
<th>Unit</th>
<th>Operational</th>
<th>Problems</th>
<th>Action Required</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Treatment</td>
<td></td>
<td></td>
<td></td>
<td>Needs pumping</td>
</tr>
<tr>
<td>PTE</td>
<td></td>
<td></td>
<td></td>
<td>Pumps need to be serviced</td>
</tr>
<tr>
<td>Aerobic RBG</td>
<td></td>
<td></td>
<td></td>
<td>Four stage. Growth: medium to none</td>
</tr>
<tr>
<td>Anoxic RBG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clarifier</td>
<td></td>
<td></td>
<td></td>
<td>Needs maintenance</td>
</tr>
<tr>
<td>Sand Filter x2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear well</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow meter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backup power</td>
<td></td>
<td></td>
<td></td>
<td>Transfer switch OK</td>
</tr>
<tr>
<td>Alkalinity</td>
<td></td>
<td></td>
<td></td>
<td>Caustic soda 25%</td>
</tr>
<tr>
<td>Carbon source</td>
<td></td>
<td></td>
<td></td>
<td>Methanol 50%, pumps may be too big</td>
</tr>
<tr>
<td>Eye wash</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effluent Appearance</td>
<td>clear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housekeeping</td>
<td>good</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Daily logs: OK. No odors were detected in the area of the facility. The facility appeared well maintained and clean. Spare parts on site.

Figure 6 - MADEP Inspection Report
APENDIX C

General Location and CHSDA Maps
WAMPANOAG TRIBE of GAY HEAD (AQUINNAH) CONTRACT HEALTH SERVICE DELIVERY AREA