



Wareham, Massachusetts
Capital Improvement Plan
Water Pollution Control Facility

September 2015

**CAPITAL IMPROVEMENT PLAN
WATER POLLUTION CONTROL FACILITY
TOWN OF WAREHAM, MASSACHUSETTS**

Prepared for
WAREHAM, MASSACHUSETTS

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1. Study Overview

1.1 Overview

In September 2014, the Town of Wareham, Massachusetts (Town) retained GHD to develop a 20-year Capital Improvement Plan (CIP) for the Town's wastewater infrastructure. The contract time for the project is one year. The following tasks are included in the scope of the project:

1. Review existing wastewater infrastructure using available record drawings, site visits, and other information available from the Town.
2. Identify an age for facilities, estimate replacement age, and estimate replacement costs based on GHD's cost estimating experience.
3. Conduct pumping station-specific evaluations as needed.
4. Conduct a criticality analysis of systems within the scope of study.
5. Develop a CIP which includes the following:
 - a. Listing of the capital projects or equipment to be purchased.
 - b. Priority list for projects, if applicable.
 - c. Determination of project costs.
 - d. Financing plan for the listed projects.
 - e. Timeframe for the completion of each project.
 - f. Justification for each project.

The following tasks are not included in the scope of the project:

1. Identification of potential improvements which may be required to meet future, more stringent permits or upgraded capacity.
2. Identification of projects that do not involve existing infrastructure.
3. Flood-related mitigation measures.
4. Facility observations by specialists at targeted locations including structural, electrical, HVAC, and/or instrumentation engineers.

1.2 Past Studies and Data

The following past studies and data were reviewed as part of this evaluation:

1. Swifts Beach I/I Study-Letter Report, produced by OSD Engineering Consultants, November 2014.
2. Pumping station condition assessments compiled by Town of Wareham Water Pollution Control Facility (WPCF) staff.
3. WPCF Upgrade Project No. M02-03 drawings produced by Camp Dresser & McKee Inc., October 2001.

2. Criticality Analysis Methodology

2.1 Overview

The Town of Wareham owns and operates a WPCF that collects and treats wastewater from approximately 60% of the Town. The WPCF was originally constructed in the 1970s and upgraded in 2005. The facility has a 1.5 million gallons per day (mgd) design capacity. The majority of the original equipment at the WPCF was replaced during the 2005 upgrade. The Town's original collection system was also constructed during the 1970s and has since been expanded. The pumping stations in the collection system range in construction year from 1970 to 2012. The majority of the equipment in each station dates to its original construction date.

The design life of mechanical equipment is typically 20 years. Much of the equipment at the older pumping stations, as well as the WPCF equipment that was not replaced during the upgrade, is well past its design life. The design life of collection system piping and concrete structures (buildings and tanks) is assumed to be a minimum of 50 years. Portions of the existing collection system have either exceeded or are approaching their design life.

To determine renewal or replacement priorities and project future financial needs a criticality analysis was conducted. A criticality analysis is a decision-making tool that can be used to prioritize projects. It outlines capital projects recommended to maintain the existing level of service for the Town's infrastructure. No costs are included for potential improvements required to meet a future, more stringent effluent permit or for improvements to existing infrastructure (such as flood-proofing infrastructure). A criticality analysis is conducted by establishing a rating for three variables:

- Likelihood of Failure (LoF)
- Consequence of Failure (CoF)
- Risk Assessment Rating

The methodology used to determine each variable is described in this section.

2.2 Likelihood of Failure (LoF)

LoF is determined by considering both the condition and performance of existing equipment.

2.2.1 Condition Assessment

Knowledge of the remaining life of an asset allows a facility to make a sound decision related to rehabilitation options and the timing of replacements. The challenge for most facilities is to spend less time on reactive maintenance and more time on preventative maintenance. When work can be planned, the cost of maintenance is significantly less.

Condition issues exist if the asset currently operates sufficiently, but either the critical equipment or structure is aged or in a deteriorated state. For this study, the design life of mechanical equipment is considered to be 20 years and the design life of concrete structures and underground pipes is a minimum of 50 years.

The criteria used in the condition assessment is outlined in Table 2-1.

Table 2-1 Condition Assessment

Rating Guidelines		
Condition Score	Condition Description of Asset	Range of Remaining Life
1 – Excellent	Asset is like new, fully operable and well maintained.	80 to 100% remaining life left
2 – Good	Asset is sound and well maintained but may be showing some signs of wear.	55 to 80% remaining life left
3 – Moderate	Asset is functionally sound, showing normal signs of wear relative to use and age.	25 to 55% remaining life left
4 – Poor	Asset functions, but requires a sustained high level of maintenance to remain operational.	10 to 25 % remaining life left
5 - Failing	Effective life exceeded and/or excessive maintenance cost incurred.	10% or less

2.2.2 Performance Assessment

Performance issues exist if the asset is either unable to sufficiently meet a level of service or if extraordinary means are necessary to keep it working properly to meet a level of service. Performance issues were noted during site walk-throughs and/or during discussions with WPCF staff. The criteria used for the performance assessment is outlined in Table 2-2.

Table 2-2 Performance Assessment

Rating Guidelines	
Performance Score	Performance Description of Asset
1 – Excellent	Asset consistently performs at or above required design standard and full efficiency.
2 – Good	Asset is performing at required design standard. Efficiency of equipment may be slightly diminished.
3 – Moderate	Asset meets basic design standards but may require regular maintenance or other measures to perform at a high level. Asset has minor failures or diminished efficiency and some performance deterioration. Likely showing modest increased maintenance and/operations costs.
4 – Poor	Asset cannot meet all required design standards (e.g. cannot meet peak conditions). Significant operational maintenance or other measures are required to sustain performance. Near term scheduled rehabilitation or replacement needed.
5 - Failing	Asset cannot meet the required design standard. Immediate replacement or rehabilitation is needed.

2.2.3 Likelihood of Failure Ranking

After both a condition and performance score have been assessed, the higher of the two rankings is used as the LoF. For example, if a piece of equipment was installed a year ago (condition assessment rating of 1) but requires significant maintenance (performance assessment rating of 4), the LoF is rated as 4.

2.3 Consequence of Failure (CoF)

The criticality of a piece of equipment is determined by the CoF. Criticality can be significant in several areas including health and safety of personnel, meeting the facility's discharge permit limits, treatment process viability, damage to other assets that rely on the equipment, and cost for rehabilitation or replacement. The guidelines used to establish a CoF are outlined in Table 2-3.

Table 2-3 Consequence of Failure Guidelines

Rating	Guidelines	WPCF Examples
1 – Negligible	Failure of asset will not result in significant consequential damages. Alternative systems or processes are in place to allow the asset to be out of service for an extended time period until repair/replacement, with negligible impact on performance or safety.	Failure of a plant water system if the facility can use potable water backup for all processes; or failure of an automatic control system for a process normally operated in manual mode; or failure of an HVAC system in a non-occupied building without cold or heat-sensitive equipment.
2 – Marginal	Failure of asset may result in minor to moderate consequential damages, minor violations, inconvenience to personnel, inability to meet required design standard, or some adverse publicity or complaints. Often used for assets which can be repaired or replaced prior to critical consequences occurring.	Failure of gate/valves infrequently used; or failure of an HVAC system in a normally occupied building such as a Control Building; or failure of instrumentation used for monitoring only where manual samples could be used instead; or failure of an odor control system which could lead to some complaints but not major negative publicity.
3 – Critical	Failure of asset likely to result in injury, significant permit violation, significant consequential damages, or significant negative publicity.	Failure of an influent pumping system, resulting in sewage overflow until a bypass system can be put in place; or failure of treatment processes which could result in effluent permit violation.
4 - Catastrophic	Failure of asset likely to cause serious injury or loss of life, long-term environmental damage, or sudden failure of other significant assets.	Failure of the main power distribution system, resulting in loss of entire treatment facility operation; or failure of gaseous chlorination system which could cause serious injury or loss of life.

2.4 Prioritization of Needs Using the Risk Assessment Matrix

The concept of risk can be used to prioritize scarce capital and operating budgets. The risk of not meeting the established level of service for a portion of the infrastructure is a function of the probability the equipment will fail (LoF) and the consequence of it failing (CoF). The two variables are used to assign a risk rating from the risk assessment matrix, shown in Table 2-4.

Table 2-4 Risk Assessment Matrix

CoF Rating → ↓ LoF Rating	Negligible (1)	Marginal (2)	Critical (3)	Catastrophic (4)
Failing (5)	Medium	High	Very High	Very High
Poor (4)	Medium	High	Very High	Very High
Moderate (3)	Low	Medium	High	Very High
Good (2)	Low	Low	Medium	High
Excellent (1)	Low	Low	Medium	High

2.5 Priority List of Projects and Timeframe for Project Completion

The risk assessment matrix allows the Town to develop a plan to prioritize projects by the risk they pose. The plan is divided into four stages; years 1 through 3, 4 through 5, 6 through 10, and 10+. Projects in the one- to three-year timeframe are those with a very high risk that should be addressed immediately. Projects with a high risk are qualified as needing improvements in the four- to five-year year timeframe. Medium risk projects are recommended for implementation in the 6- to 10-year timeframe. Low risk projects are anticipated in the 10+-year timeframe.

3. Current State of Wastewater Infrastructure

3.1 Wareham Water Pollution Control Facility

The Wareham WPCF was originally constructed in the 1970s and upgraded in 2005. The facility is designed to treat an annual average flow of 1.5 mgd. Most of the mechanical equipment at the facility was installed during the 2005 upgrade and is approximately halfway through its useful design life.

The individual components of the WPCF are outlined below.

3.1.1 Administration Building

The Administration Building was constructed in 2005 and houses the plant staff, control room, coffee room, mechanical room, conference room, storage, and restroom facilities.

Condition Issues

The mechanical equipment and building are both well within their design life.

Performance Issues

No performance issues were noted during site walk-throughs or in discussions with WPCF staff.

Risk Assessment

Table 3-1 summarizes the failure risks associated with the Administration Building.

Table 3-1 Administration Building Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Administration Building	Structure	2	2	Low
	Architectural	2	2	Low
	Heating, ventilation, air conditioning	3	2	Medium
	Electrical	3	2	Medium
	Instrumentation and controls	3	2	Medium

3.1.2 Anoxic Tanks

The facility has two anoxic selector tanks. Flow enters each tank through a 24-inch ductile iron gravity pipe. Each tank has three floating mixers.

Condition Issues

Both of the anoxic selector tanks and associated equipment were constructed during the 2005 upgrade. The mechanical equipment and tanks are well within their design life.

Performance Issues

During a site walk-through, it was noted that several of the spray nozzles around the perimeter of the tanks are broken.



Risk Assessment

Table 3-2 summarizes the failure risks associated with the anoxic tanks.

Table 3-2 Anoxic Tanks Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Anoxic tanks	Process equipment	3	2	Medium
	Structures	2	2	Low
	Piping	2	2	Low
	Valves and gates	2	2	Low
	Stairs, handrail, grating, hatches	2	2	Low
	Electrical	3	2	Medium
	Instrumentation and controls	3	2	Medium

3.1.3 Aeration Tanks

The facility has three aeration basins.

Condition Issues

Aeration Tank Nos. 1 and 2 were constructed in the 1970s and retrofitted during the 2005 upgrade project. Aeration Tank No. 3 was constructed during the 2005 upgrade. All of the aeration tank process equipment was installed during the 2005 upgrade.

Performance Issues

The WPCF staff has noted the concrete of the two older tanks is pitted and in need of repair. The uncertainty of the structural integrity of the walkways in Aeration Tank Nos. 1 and 2 is also a concern. During a site visit, it was noted that the process piping aeration valves should be downsized for better process air control.



Risk Assessment

Table 3-3 summarizes the failure risks associated with the aeration tanks.

Table 3-3 Aeration Tanks Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Aeration Tanks	Process equipment	3	2	Medium
	Piping	2	2	Low
	Valves and gates	4	2	High
	Stairs, handrail, grating, hatches	2	2	Low
	Electrical	3	2	Medium
	Instrumentation and controls	3	2	Medium
Aeration Tank Nos. 1 and 2	Structures	5	3	Very High
Aeration Tank No. 3	Structures	2	3	Medium

3.1.4 Sludge Dewatering Building

The Sludge Dewatering Building is a two-story building which houses a polymer system on the first floor, a single gravity belt thickener on the second floor, and a pump room in the basement. Air from the Sludge Dewatering Building is treated with a biofilter system.

Condition Issues

The Sludge Dewatering Building was originally constructed in the 1970s and modified during the 2005 upgrade project. The majority of the equipment in the building was installed during the 2005 upgrade project. The building's structural and architectural features have approximately 10% remaining life until they reach their minimum design life of 50 years, resulting in a high LoF rating. Once the building is 50 years old, it is recommended a condition evaluation be conducted to determine its expected remaining life.

Performance Issues

No performance issues were noted during the site walk-through or during discussions with the staff.

Risk Assessment

Table 3-4 summarizes the failure risks associated with the Sludge Dewatering Building.



Table 3-4 Sludge Dewatering Building Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Dewatering Building	Architectural	5	2	High
	Structural	5	2	High
	HVAC	3	2	Medium
	Electrical	3	2	Medium
	Instrumentation and controls	3	2	Medium
	Gravity belt thickener	3	2	Medium
	Thickened sludge transfer pump	3	2	Medium
	Sludge storage transfer pump	3	2	Medium
	Filtrate transfer pump	3	2	Medium
	Inline grinder	3	2	Medium
	Natural gas burner	3	2	Medium
	Base-mounted pumps	3	2	Medium
	Biofilter	3	2	Medium

3.1.5 Filter/Blower Building

The Filter/Blower Building houses three effluent filters, a mudwell, filter backwash clearwell, and a pump room in the basement of the building. The building also contains a UV disinfection system, effluent Parshall flume, chemical feed system (alum and sodium hypochlorite), and a Blower Room where the filter backwash, aeration, and equalization blowers are located. A methanol bulk storage and feed system is located outside the building.

Condition Issues

The Filter Building was constructed during the 2005 upgrade. The majority of the equipment in the building was also installed during the 2005 upgrade.

Performance Issues

During a site walk-through, rust was observed on equipment. The operators noted several performance issues with equipment at the Filter/Blower Building:

1. The roof HVAC unit has failed and is need of replacement
2. Roof repairs are needed.
3. The denitrification filters plug frequently.
4. The plant water system is potentially undersized for the needs of the facility and frequently experiences low water pressure.



Based on the operators' comments, the performance ranking was increased for the items noted above, resulting in an elevated LoF.

Risk Assessment

Table 3-5 summarizes the failure risks associated with the Filter/Blower Building.

Table 3-5 Filter/Blower Building Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Filter/Blower Building	HVAC	5	3	High
	Electrical	3	2	Medium
	Instrumentation and controls	3	2	Medium
	Architectural	2	2	Low
	Structural	2	2	Low
	Denitrification filters	4	2	High
	Clearwell	2	2	Low
	Plant water system	4	2	High
	Internal recycle pump	3	2	Medium
	Flow equalization pump	3	2	Medium
	Aeration blowers	3	2	Medium
	Equalization blowers	3	2	Medium
	Filter backwash blowers	3	2	Medium
	Base-mounted pumps	3	2	Medium
	Alum bulk storage tanks	3	2	Medium
	Sodium hypochlorite storage feed system	3	2	Medium
	Electronic metering pumps	3	2	Medium
	Chemical feed system	3	2	Medium
	Methanol tank	3	2	Medium
	UV disinfection system	3	2	Medium

3.1.6 Headworks

The Headworks Building contains a septage receiving station, vortex grit trap influent screen, and influent Parshall flume.

Condition Issues

The Headworks Building was constructed during the 2005 upgrade project. The majority of the process equipment in the building was installed during the same project. Air from the Headworks Building is treated with a biofilter system.

Performance Issues

During the site walk-through, rust and peeling paint were observed on equipment. No other issues were noted by the WPCF staff.



Risk Assessment

Table 3-6 summarizes the failure risks associated with the Headworks Building.

Table 3-6 Headworks Building Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Headworks Building	HVAC	3	2	Medium
	Electrical	3	2	Medium
	Instrumentation and controls	3	2	Medium
	Architectural	2	2	Low
	Structural	2	2	Low
	Fire alarm system	3	3	High
	Fire protection system sprinklers	3	3	High
	Manual bypass screen	3	2	Medium
	Headworks biofilter	3	2	Medium
	Influent fine screen	3	2	Medium
	Septage receiving station	3	2	Medium
	Vortex grit classifier	3	2	Medium
	Shaftless grit screw classifier	3	2	Medium
	Septage receiving station blower	3	2	Medium
	Biofilter humidification system	3	2	Medium

3.1.7 Influent Equalization Basins

The facility has two influent equalization basins. Aeration is provided to the basins through diffusers at the bottom of each basin. The equalization blowers are located in the Filter/Blower Building.

Condition Issues

Both influent equalizations basins and associated equipment, were installed during the 2005 upgrade.

Performance Issues

No performance issues were noted during site walk-throughs or in discussions with WPCF staff.

Risk Assessment

Table 3-7 summarizes the failure risks associated with the influent equalization basins.

Table 3-7 Influent Equalization Basins Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Equalization basins	Instrumentation and controls	3	2	Medium
	Electrical	3	2	Medium
	Equalization pumps	3	2	Medium
	Equalization basins	3	2	Medium

3.1.8 Distribution Boxes and Flow Measurement

Condition Issues

The majority of the distribution boxes, meter vaults, and Parshall flumes at the facility were constructed during the 2005 upgrade. The aeration basin flow distribution structure, originally constructed in the 1970s, was modified to distribute flow between the two original tanks and the tank constructed during the 2005 upgrade.



Performance Issues

The WPCF operator noted that flow is evenly distributed through the aeration basin flow distribution structure to the three tanks.

Risk Assessment

Table 3-8 summarizes the failure risks associated with the distribution boxes and meter vaults.

Table 3-8 Distribution Boxes and Meter Vaults Risk Assessment

Component	Sub Component	LoF	CoF	Risk Rating
Distribution box	Equalization flow splitter box	2	2	Low
	Aeration basin flow distribution	3	3	High
	Secondary clarifier flow distribution	2	2	Low
	Influent distribution box	2	2	Low
Flow measurement	Flow meter vault	3	2	Medium
	Influent Parshall flume	3	2	Medium
	Effluent Parshall flume	3	2	Medium

3.1.9 Operations Building

The Operations Building contains a Lab Room on the first floor and a Pump Room in the basement.

Condition Issues

The Operations Building was originally constructed in the 1970s and retrofitted during the 2005 upgrade. The building's structural and architectural features have approximately 10% remaining life until they reaches their minimum design life of 50 years, resulting in a high LoF rating. Once the building is 50 years old, it is recommended a condition evaluation be conducted to determine its expected remaining life.

Performance Issues

WPCF staff noted that the Operations Building roof is in need of repair. It was also stated that the scum pumps were installed in the 1970s, are well past their useful design life, and are observed to be cracking and breaking.

Risk Assessment

Table 3-9 summarizes the failure risks associated with the Operations Building.

Table 3-9 Operations Building Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Operations Building	Architectural	5	2	High
	Structural	5	2	High
	HVAC	3	2	Medium
	Electrical	3	2	Medium
	Instrumentation and controls	3	2	Medium
	Roof	5	3	Very High
	Scum pumps	5	2	High
	Return sludge pumps	3	2	Medium
	Waste sludge pumps	3	2	Medium
	Base mounted pumps	3	2	Medium
	Internal recycle pumps	3	2	Medium

3.1.10 Standby Generators

The facility has two standby generators; one is located in the Operations Building and the second is located outdoors.

Condition Issues

The outdoor emergency generator was installed during the 2005 upgrade. The standby generator located in the Operations Building was installed in the 1970s and is well past its design life.

Performance Issues

No performance-related issues were noted during site walk-throughs or discussions with WPCF staff.

Risk Assessment

Table 3-10 summarizes the failure risks associated with the standby generator.

Table 3-10 Standby Generator Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Generator	1000 kW outdoor generator	3	3	High
	350 kW generator in Operations Building	5	3	Very High

3.1.11 Septage Equalization Tanks and Pump and Blower Buildings

The facility has four septage equalization basins and two Pump and Blower Buildings.

Condition Issues

The majority of the equipment in the Pump and Blower Buildings was installed in the 1970s and is well past its useful life. The buildings' structural and architectural features have approximately 10% remaining life until they reach their minimum design life of 50 years, resulting in a high LoF rating. Once the buildings are 50 years old, it is recommended a condition evaluation be conducted to determine their expected remaining life.

Performance Issues

No performance issues were noted during the site walk-throughs or in discussion with WPCF staff.

Risk Assessment

Table 3-11 summarizes the failure risks associated with the Pump and Blower Buildings.

Table 3-11 Pump and Blower Buildings Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Pump and Blower Buildings	Architectural	5	2	High
	Structural	5	2	High
	HVAC	5	2	High
	Electrical	5	2	High
	Instrumentation and controls	5	2	High
	Plunger pumps	5	2	High
	Mixers	5	2	High
	Blowers	5	2	High

3.1.12 Secondary Clarifiers

The facility has three circular secondary clarifiers. An alum feed point is located at the secondary clarifier distribution box prior to the clarifiers. Scum from the clarifiers is pumped to sludge storage.

Condition Issues

Secondary Clarifier Nos. 1 and 2 were constructed in the 1970s. The equipment for these clarifiers dates to the original construction and is well past its useful design life. Secondary Clarifier No. 3 and its associated equipment was constructed during the 2005 upgrade.

Performance Issues

No performance issues were noted during the site walk-through or through discussions with WPCF staff.

Risk Assessment

Table 3-12 summarizes the failure risks associated with the secondary clarifiers.

Table 3-12 Secondary Clarifiers Risk Assessment

Component	Sub Component	LoF	CoF	Risk Rating
Clarifiers Nos. 1 and 2	Structural	5	3	Very High
	Electrical	5	3	Very High
	Instrumentation	5	3	Very High
	Process equipment	5	3	Very High
Clarifier No. 3	Structural	2	3	Medium
	Electrical	3	3	High
	Instrumentation	3	3	High
	Process equipment	3	3	High

3.1.13 Site/Civil

Condition Issues

The majority of the roads, underground piping, and manholes at the facility were constructed in the 1970s and are approaching the end of their useful design life.

Performance Issues

No performance issues were noted in site walk-throughs or in conversations with WPCF staff.

Risk Assessment

Table 3-13 summarizes the failure risks associated with the site and civil aspects of the facility.

Table 3-13 Site/Civil Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Site/civil	Roads	5	2	High
	Underground piping	5	2	High
	Manholes	5	2	High
	Paint	3	2	Medium
	Stormwater management and site landscaping	2	1	Low
	Fencing/site security	3	1	Low
	Site lighting	3	1	Low

3.1.14 Sludge Storage Tanks

The facility has two sludge storage tanks in one concrete structure.

Condition Issues

The sludge storage tanks were originally constructed in the 1970s. The majority of the equipment was installed during the same time period and is well past its useful design life. The concrete structures structural and architectural features have approximately 10% remaining life until they have reached their minimum design life of 50 years, resulting in a high LoF rating. Once the concrete structure is 50 years old, it is recommended that a condition evaluation be conducted to determine its expected remaining life and whether it needs to be replaced or repaired.

Performance Issues

No performance issues were noted during site walk-throughs or in discussions with WPCF staff.

Risk Assessment

Table 3-14 summarizes the failure risks associated with the sludge storage tanks.

Table 3-14 Sludge Storage Tanks Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Sludge storage tanks	Architectural	5	2	High
	Structural	5	2	High
	HVAC	5	2	High
	Electrical	5	2	High
	Instrumentation and controls	5	2	High
	Sludge tank blowers	5	2	High
	Sludge tank mixers	5	2	High

3.1.15 Soda Ash Tower

The facility has a 12-foot diameter chemical storage silo, which also contains a 200-gallon soda ash solution tank, mixer, feed pump, and emergency shower/eyewash.

Condition Issues

The soda ash tower was installed during the 2005 upgrade.

Performance Issues

WPCF staff noted that the heating element in the tower is insufficient to adequately heat the tower, leading to chemical caking.

Risk Assessment

Table 3-15 summarizes the failure risks associated with the soda ash tower.

Table 3-15 Soda Ash Tower Risk Assessment

Component	Sub-Component	LoF	CoF	Risk Rating
Soda ash tower	Structural	2	2	Low
	HVAC	4	2	High
	Instrumentation and controls	3	2	Medium
	Electrical	3	2	Medium
	Eyewash system	3	3	High
	Mix tank	3	2	Medium
	Mixer	3	2	Medium
	Pumps	3	2	Medium
	Piping	3	2	Medium
	Vibrators	3	2	Medium
	Gates and valves	2	2	Low

3.2 Pumping Stations and Collection System

There are currently 43 pumping stations within the Town's collection system. All of the stations are either owned or operated by the Town, with the exception of the Police Station Pumping Station, which is privately owned and operated and thus not included in this study.

Flow from the Town of Bourne is handled by the following four pumping stations; Cohasset Narrows, Dick's Pond, Depot Street and Saltworks Road. The Town of Bourne is responsible for 17.9% of the capital costs for these pump stations and associated force mains.

The stations' age of construction ranges from 1970 to 2012. The majority of equipment in each station was installed during its original construction. The equipment in over half of the stations is well past its useful design life. Once equipment has exceeded its design life, it is essentially operating on "borrowed time" and is no longer considered reliable. As the equipment continues to age, the cost of operating and maintaining it will increase. Some of the equipment, such as the mechanical equipment in the Town's five ejector stations, is obsolete and replacement parts are difficult and costly to obtain. Ejector stations are no longer considered a common pumping station technology and certain parts for these stations can no longer be readily ordered and must be specially fabricated when they fail. Therefore, a component failure could lead to long-term equipment outages and potentially costly temporary measures when equipment replacement is necessary. The condition of the collection system piping in each sewershed is unknown.

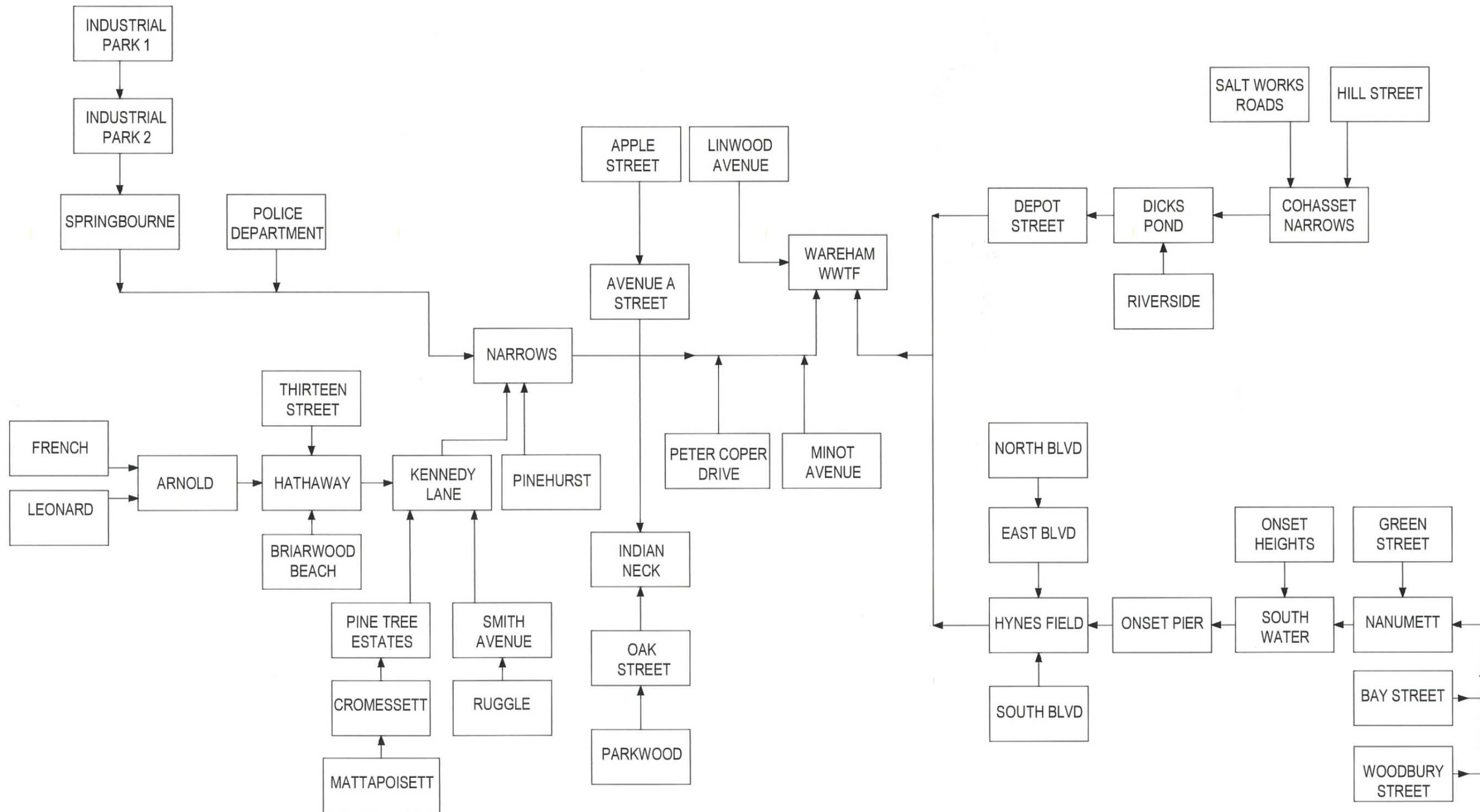
A schematic of the Town's collection system is shown in Figure 3-1. As illustrated, the system has several key stations which collect flow from many other stations. If any of these key stations were to fail, all of the upstream stations would be affected. The majority of these key stations are among the oldest in the collection system. The Narrows is the Town's oldest station and has the greatest number of dependent stations (17). Several key stations also serve vital infrastructure, such as the Town's hospital and Fire Department headquarters, increasing their criticality.

Since the age and criticality of the pumping station and piping in the same sewershed is similar, the risk analysis of the Town's pumping stations and collection system was conducted by sewershed. A sewershed is defined as the extent of the collection system that flows into a pumping station. A map of the Town's sewersheds is shown in Figure 3-2.

3.2.1 Condition Issues

A rating was assigned based on the criteria outlined in Table 2-1. As previously stated, the design life of pumping station equipment is assumed to be 20 years, and for collection system piping and masonry buildings, a minimum of 50 years

The condition of each pumping station was assessed based on the expected remaining life of its equipment. The condition of each sewershed's collection system was assessed based on a minimum 50-year lifespan. Although the lifespan of collection system infrastructure may potentially extend beyond 50 years, it is recommended the infrastructure be investigated further once it has reached this age, to determine if replacement or repair is needed.



TOWN OF WAREHAM, MASSACHUSETTS
CAPITAL IMPROVEMENT PLAN

Job Number | 86-18489

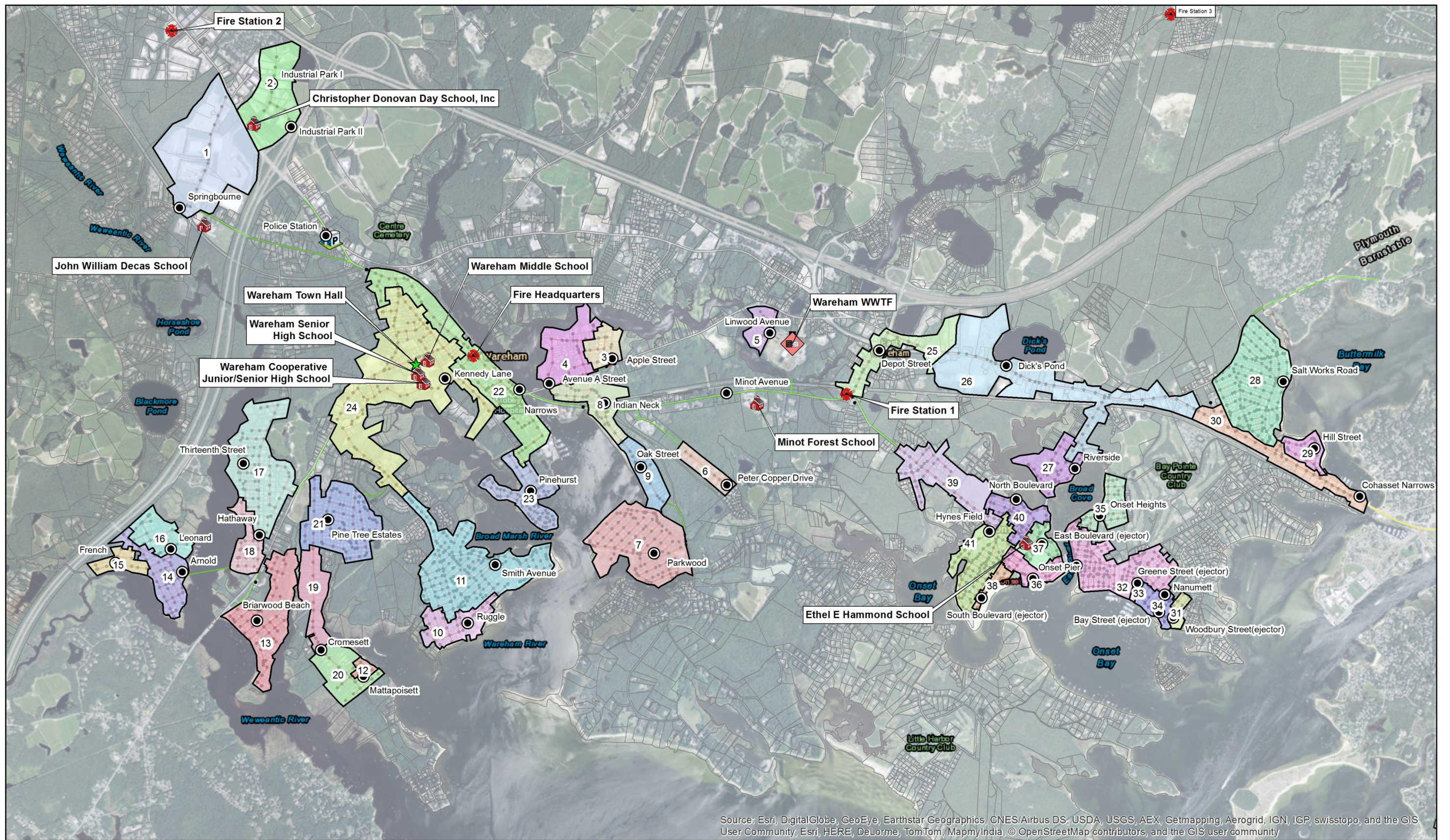
Revision |

Date | SEPT 2015

**PUMPING STATION
INTERDEPENDENCY SCHEMATIC**

Figure 3-1

1545 Iyannough Road, Hyannis Massachusetts 02601 USA T 1 774 470 1630 F 1 774 470 1631 E hyamail@ghd.com W www.ghd.com



Paper Size ARCH D

0 1,200 2,400 4,800 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

LEGEND

- Sewershed (TYP) (with ID Number)
- Police Department
- Pump Station
- Town Hall
- Hospital
- Manhole
- Gravity Sewer
- Force Main
- Private Connection
- Wareham WWTF
- Wareham Fire Station

Town of Wareham, Ma
Capital Improvement Plan

PUMPING STATION SEWERSHEDS

Job Number 86-18489
Revision A
Date 01 Sep 2015

Figure 3-2

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

© 19618489/GIS/Maps/MXD_Deliverables/8618489F01_Sewer Map Water Resource 11x17.mxd
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Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by: jjobrien

3.2.2 Performance Issues

Pumping station performance issues were noted in the condition assessments compiled for each station by WPCF staff. The condition assessments are included in Appendix A.

The Town has recently purchased a camera to conduct Closed Circuit Television (CCTV) inspections on portions of their collection system. They have also invested in equipment to clean the collection system piping.

An infiltration and inflow (I/I) study was completed by OSD Engineering Consultants on the Swifts Beach sewer collection system in 2014. The Swifts Beach sewer collection system is comprised of the Ruggles catchment area and the Smith Avenue catchment area. It was concluded that there is evidence of excessive I/I in the Ruggles catchment area and recommended that the area be investigated further through smoke testing, house-to-house surveys, flow monitoring, and CCTV inspections. While evidence of excessive I/I was not found in the Smith Avenue catchment area, it was recommended the collection area be subdivided into smaller study areas and investigated further. The Town plans to continue conducting I/I studies and performing CCTV inspections on portions of their system in order to assess whether performance issues exist within the system.

3.2.3 Consequence of Failure

CoF for each pumping station and its associated collection system was determined by the criteria outlined in Table 2-3. The following variables were used in prioritizing the severity of a pumping station failing:

1. Is any critical infrastructure served by the sewershed? Critical infrastructure includes hospitals, fire stations, police stations, schools, Town Hall, and emergency shelters.
2. Is the sewershed located in a Zone II water supply area?
3. Is the sewershed located in a Priority and Estimated Habitat Area, as defined by the Massachusetts Endangered Species Act (MESA)?
4. How many other pumping stations are dependent (flow into) the pumping station?

If a sewershed (pumping station and associated collection system) met any of the criteria detailed above, it was assigned a higher CoF.

3.2.4 Risk Assessment

Table 3-16 summarizes the failure risks associated with the pumping stations. Table 3-17 summarizes the failure risks associated with the collection system. LoF is determined based on the age of infrastructure. As outlined in Table 2-1, infrastructure with less than 10% of its remaining life has the highest likelihood of failure. As discussed previously, it is recommended that masonry structures and collection system piping be inspected as it approaches 50 years, to determine if replacement or repairs are needed.

Table 3-16 Pumping Stations Risk Assessment

Component	Year Commissioned	LoF	CoF	Risk Rating	Additional Comments
Narrows	1970	5	4	Very High	Sewershed contains hospital and fire headquarters. 17 pumping stations flow into Narrows.
Depot Street	1989	5	4	Very High	Sewershed contains fire station. Five pumping stations flow into Depot Street.
Dick's Pond	1989	5	4	Very High	Sewershed in a Zone II water protection area. Three pumping stations flow into Dick's Pond.
Cohasset Narrows	1989	5	4	Very High	Sewershed contains Bourne fire station and Bourne Police Department. Two pumping stations flow into Cohasset Narrows.
Springborne	1991	5	3	Very High	Sewershed contains Town's emergency shelter. Two pumping stations flow into Springborne.
East Boulevard	1971	5	3	Very High	Sewershed contains school. One pumping station flows into East Boulevard.
Minot	1980	5	3	Very High	Sewershed contains school.
Onset Heights	1996	5	3	Very High	Sewershed contains estimated/priority rare species area.
Kennedy Lane	2004	3	3	High	Sewershed contains three schools and Town Hall. 11 pumping stations flow into Kennedy Lane.
Hynes Field	1971	5	2	High	Nine pumping stations flow into Hynes Field.
Onset Pier	1971	5	2	High	Five pumping stations flow into Onset Pier.
Nanumette Air Station	1989	5	2	High	Five pumping stations rely on the Nanumette Air Station.
South Water Street	1971	5	2	High	Four pumping stations flow into South Water Street.
Pine Tree Estates (Terry Lane)	1992	5	2	High	Two pumping stations flow into Pine Tree Estates.
Smith	1978	5	2	High	One pumping station flows into Smith.
North Boulevard	1971	5	2	High	
South Boulevard	1972	5	2	High	
Pinehurst	1978	5	2	High	
Bay Street	1989	5	2	High	
Green Street	1989	5	2	High	

Component	Year Commissioned	LoF	CoF	Risk Rating	Additional Comments
Peter Copper	1989	5	2	High	
Woodbury	1989	5	2	High	
Hill Street Jefferson Shores	1990	5	2	High	
Saltworks Road	1990	5	2	High	
Riverside	1996	5	2	High	
Briarwood	2006	3	3	High	Sewershed contains estimated/ priority rare species area.
Hathaway	2006	3	2	Medium	Five pumping stations flow into Hathaway.
Arnold	2006	3	2	Medium	Two pumping stations flow into Arnold.
Cromsset	2012	1	3	Medium	Sewershed contains estimated/priority rare species area. One pumping station flows into Cromsset.
Thatcher (Industrial Park 2)	2012	1	3	Medium	Sewershed contains school. One pumping station flows into Thatcher.
Kendrick (Industrial Park 1)	2012	3	2	Medium	
Linwood	2005	3	2	Medium	
French Street	2006	3	2	Medium	
Leonard Street	2006	3	2	Medium	
Thirteenth Street	2006	3	2	Medium	
Indian Neck	2010	2	2	Low	One pumping station flows into Indian Neck.
Oak Street	2010	2	2	Low	One pumping station flows into Oak Street.
Avenue A	2011	2	2	Low	One pumping station flows into Avenue A.
Parkwood	2010	2	2	Low	
Apple Street	2012	1	2	Low	
Mattapoissett Road	2012	1	2	Low	
Ruggles	2012	1	2	Low	

Table 3-17 Collection System Risk Assessment

Component	Year Commissioned	LoF	CoF	Risk Rating	Additional Comments
Narrows	1970	5	4	Very High	Sewershed contains hospital and fire headquarters. 17 pumping stations flow into Narrows.
Depot Street	1989	3	4	Very High	Sewershed contains fire station. Five pumping stations flow into Depot Street.

Component	Year Commissioned	LoF	CoF	Risk Rating	Additional Comments
Dick's Pond	1989	3	4	Very High	Sewershed in a Zone II water protection area. Three pumping stations flow into Dick's Pond.
Cohasset Narrows	1989	3	4	Very High	Sewershed contains Bourne fire station and Bourne Police Department. Two pumping stations flow into Cohasset Narrows.
Springborne	1991	3	3	High	Sewershed contains Town's emergency shelter. Two pumping stations flow into Springborne.
East Boulevard	1971	4	3	Very High	Sewershed contains school. One pumping station flows into East Boulevard.
Minot	1980	3	3	High	Sewershed contains school.
Onset Heights	1996	2	3	Medium	Sewershed contains estimated/priority rare species area.
Kennedy Lane	2004	2	3	Medium	Sewershed contains three schools and Town Hall. 11 pumping stations flow into Kennedy Lane.
Hynes Field	1971	4	2	High	Nine pumping stations flow into Hynes Field.
Onset Pier	1971	4	2	High	Five pumping stations flow into Onset Pier.
Nanumette Air Station	1989	3	2	Medium	Five pumping stations rely on the Nanumette Air Station.
South Water Street	1971	4	2	High	Four pumping stations flow into South Water Street.
Pine Tree Estates (Terry Lane)	1992	3	2	Medium	Two pumping stations flow into Pine Tree Estates.
Smith	1978	3	2	Medium	One pumping station flows into Smith.
North Boulevard	1971	4	2	High	
South Boulevard	1972	4	2	High	
Pinehurst	1978	3	2	Medium	
Bay Street	1989	3	2	Medium	
Green Street	1989	3	2	Medium	
Peter Copper	1989	3	2	Medium	
Woodbury	1989	3	2	Medium	
Hill Street Jefferson Shores	1990	3	2	Medium	
Saltworks Road	1990	3	2	Medium	
Riverside	1996	2	2	Low	
Briarwood	2006	1	3	Medium	Sewershed contains estimated/priority rare species area.
Hathaway	2006	1	2	Low	Five pumping stations flow into

Component	Year Commissioned	LoF	CoF	Risk Rating	Additional Comments
					Hathaway.
Arnold	2006	1	2	Low	Two pumping stations flow into Arnold.
Cromsesset	2012	1	3	Medium	Sewershed contains estimated/priority rare species area. One pumping station flows into Cromsesset.
Thatcher (Industrial Park 2)	2012	1	3	Medium	Sewershed contains school. One pumping station flows into Thatcher.
Kendrick (Industrial Park 1)	2012	2	2	Low	
Linwood	2005	2	2	Low	
French Street	2006	1	2	Low	
Leonard Street	2006	1	2	Low	
Thirteenth Street	2006	1	2	Low	
Indian Neck	2010	1	2	Low	One pumping station flows into Indian Neck.
Oak Street	2010	1	2	Low	One pumping station flows into Oak Street.
Avenue A	2011	1	2	Low	One pumping station flows into Avenue A.
Parkwood	2010	1	2	Low	
Apple Street	2012	1	2	Low	
Mattapoisett Road	2012	1	2	Low	
Ruggles	2012	1	2	Low	

4. CIP Project List

4.1 Overview and Determination of Project Costs

This 20-year Capital Improvement Plan includes the planning and design (if applicable) phases of several important capital projects, with the goal of timely replacement of existing aged infrastructure. Anticipated planning level project costs were determined using GHD cost estimating experience. Costs are presented as total capital cost in ENR index year of 2015.

4.1.1 New, Renewal, and Replacement Projects

This study was completed to estimate the anticipated costs necessary to maintain the existing level of service for the Town's existing wastewater infrastructure. No costs were carried for potential improvements at the WPCF which may be required to meet future, more stringent permits or for upgrading the capacity of existing equipment. Projects that do not involve existing infrastructure are not included in this evaluation.

Renewal and replacement projects are recommended when major portions of the infrastructure require rehabilitation or replacement, respectively. Tables 4-1, 4-2, and 4-3 outline renewal and replacement projects proposed between 2015 and 2035 for the collection system, pumping stations, and WPCF, respectively. The tables show the project, estimated project cost, and the timeframe in which the project may occur and includes a justification for each project. The projected year of investment for the projects is based on age, condition, and remaining life data provided for the Town's infrastructure. Total annual estimated capital costs for the 20-year period are shown in Figure 4-1 in 2015 dollars. The total annual estimated capital costs include anticipated projects for the WPCF, collection system, and pumping stations. The expenditure for each year is shown as the average of the timeframe.

Table 4-1 Collection System Project List

Item No.	Location	Project	Justification	Price	Scope	Timeframe				Bucket		
						0-3 Years	3-5 Years	6-10 Years	10+ Years	New Project	Renewal Project	Replacement Project
1	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation	\$1,000,000						
2	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation	\$1,000,000						
3	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation	\$1,000,000						
4	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation		\$1,000,000					
5	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation		\$1,000,000					
6	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation			\$1,000,000				
7	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation			\$1,000,000				
8	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation			\$1,000,000				
9	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation			\$1,000,000				
10	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$1,000,000	Allowance for study, investigation and remediation			\$1,000,000				
11	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
12	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
13	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
14	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
15	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
16	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
17	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
18	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
19	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
20	Collection system	Investigation and rehabilitation	Infrastructure condition/age	\$3,000,000	Allowance for study, investigation and remediation				\$3,000,000			
TOTAL				\$40,000,000		\$3,000,000	\$2,000,000	\$5,000,000	\$30,000,000			

Table 4-2 Pumping Station Project List

Item No.	Location	Project	Justification	Price	Scope	Timeframe				Bucket		
						0-3 Years	3-5 Years	6-10 Years	10+ Years	New Project	Renewal Project	Replacement Project
1	Narrows	Condition evaluation	Infrastructure condition/age			\$20,000						
2	Depot Street	Condition evaluation	Infrastructure condition/age			\$20,000						
3	Dick's Pond	Condition evaluation	Infrastructure condition/age			\$20,000						
4	Cohasset Narrows	Condition evaluation	Infrastructure condition/age			\$20,000						
5	East Boulevard	Condition evaluation	Infrastructure condition/age			\$20,000						
6	Minot	Condition evaluation	Infrastructure condition/age			\$20,000						
7	Onset Heights	Condition evaluation	Infrastructure condition/age			\$20,000						
8	Springborne	Condition evaluation	Infrastructure condition/age			\$20,000						
9	Narrows	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment	\$2,600,000						
10	Depot Street	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment	\$2,100,000						
11	Dick's Pond	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment	\$2,100,000						
12	Cohasset Narrows	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment	\$2,100,000						
13	East Boulevard	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment	\$1,600,000						
14	Minot	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment	\$1,600,000						
15	Onset Heights	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment	\$2,100,000						
16		Pump station evaluation	Evaluate pump stations scheduled to be rehabilitated in years 5-10 in order to determine priority projects		Evaluation	\$50,000						
17	Springborne	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment	\$2,100,000						
18	Kennedy Lane	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment		\$2,100,000					
19	Hynes Field	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment		\$2,100,000					
20	Onset Pier	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment		\$2,100,000					
21	South Water Street	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment		\$2,100,000					
22	Pine Tree Estates	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment		\$2,100,000					

Item No.	Location	Project	Justification	Price	Scope	Timeframe				Bucket		
						0-3 Years	3-5 Years	6-10 Years	10+ Years	New Project	Renewal Project	Replacement Project
23	Smith	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment		\$2,600,000					
24	North Boulevard	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$2,100,000				
25	South Boulevard	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$1,600,000				
26	Pinehurst	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$2,100,000				
27	Bay Street	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$1,600,000				
28	Green Street	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$1,600,000				
29	Peter Cooper	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$1,600,000				
30	Woodbury	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$1,600,000				
31	Hill Street Jefferson Shores	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$1,600,000				
32	Saltworks Road	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$2,100,000				
33	Riverside	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$1,600,000				
34	Linwood	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$1,600,000				
35	Briarwood	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment			\$2,100,000				
36		Pump station evaluation	Evaluate pump stations scheduled to be rehabilitated in years 10+ in order to determine priority projects		Evaluation			\$ 50,000				
37	Hathway	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$1,600,000			
38	Arnold	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$2,100,000			
39	Cromsset Road	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$1,600,000			
40	Thatcher PS	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$1,600,000			
41	Kendrick PS	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$2,100,000			
42	French Street	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$2,100,000			
43	Leonard Street	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$2,100,000			
44	Thirteenth Street	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$1,600,000			

Item No.	Location	Project	Justification	Price	Scope	Timeframe				Bucket		
						0-3 Years	3-5 Years	6-10 Years	10+ Years	New Project	Renewal Project	Replacement Project
46	Indian Neck	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$2,600,000			
47	Oak Street	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$2,100,000			
48	Apple Street	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$2,100,000			
49	Avenue A	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$1,600,000			
50	Parkwood	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$1,600,000			
51	Mattapoissett Road	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$2,100,000			
52	Ruggles	Pump station rehabilitation	Infrastructure condition/age		Replace mechanical equipment				\$2,600,000			
TOTAL						\$16,490,000	\$13,100,000	\$21,250,000	\$29,500,000			

Table 4-3 WPCF Project List

Item No.	Location	Project	Justification	Price	Scope	Timeframe				Bucket		
						0-3 Years	3-5 Years	6-10 Years	10+ Years	New Project	Renewal Project	Replacement Project
1	Headworks	General painting	Rust and peeling paint observed during site walk-through	\$1,000	General painting, materials only			\$1,000				
2	Anoxic tanks	Replace broken spray nozzles	Broken nozzles observed during site walk-through	\$1,000	Nozzle replacement, materials only			\$1,000				
3	Aeration Tank Nos. 1 and 2	Epoxy inside of tank	WPCF staff have observed concrete pitting in tanks	\$416,200	Apply epoxy liner	\$420,000						
4	Aeration tanks	Downsize aeration control valves	Downsizing valves will provide improved process control and energy efficiency	\$100,000	Install new aeration valves	\$100,000						
5	Filter/Blower Building	General painting	Rust observed during site walk-through	\$1,000	General painting , materials only			\$1,000				
6	Sludge holding tanks	General painting	Rust observed during site walk-through	\$1,000	General painting, materials only			\$1,000				
7	Operations Building	Operations Building roof	WPCF staff noted roof needs replacement	\$60,000	Roof replacement	\$60,000						
8	Filter Building	Roof/HVAC-Blower Building	WPCF staff noted roof unit needs to be replaced and roof needs to be repaired	\$36,000	Roof unit replacement/roof repair	\$40,000						
9	WPCF	Blowers/motors	WPCF staff noted project required for process control at plant	\$200,000		\$200,000						
10	Denitrification filters	Replace filter media	WPCF staff noted filters plug constantly and overflow			\$200,000						
11	Plant water system	Replace plant water system	Plant water system undersized	\$105,000		\$110,000						
12	Aeration tanks	Flow distribution	WPCF staff noted uneven flow distribution between aeration tanks impacting treatment			\$500,000						
13	Operations Building	Generator replacement	Equipment past its useful life	\$190,000	Replace generator	\$190,000						
14	Secondary Clarifiers Nos. 1 and 2	Replace clarifier equipment	Equipment past its useful life	\$600,000		\$430,000						
15	Secondary Clarifiers Nos. 1 and 2	Resurfacing clarifiers	WPCF staff noted concrete pitting	\$150,000	Clarifier resurfacing	\$150,000						
16	Soda ash tower	Replace heating system	WPCF staff noted chemical caking occurring due to inadequate heat in the tower	\$40,000	Replace heating system		\$40,000					
17	Operations Building	Replace scum pumps	Equipment past useful life and failing	\$45,000	Replace scum pumps		\$45,000					
18	WPCF	Rehabilitate equipment approaching the end of useful life	Equipment approaching end of useful life	\$2,600,000					\$2,600,000			
19	WPCF	Replace outdated controls equipment	Equipment approaching end of useful life				\$150,000	\$500,000				
TOTAL				\$4,546,200		\$2,400,000	\$235,000	\$504,000	\$2,600,000			

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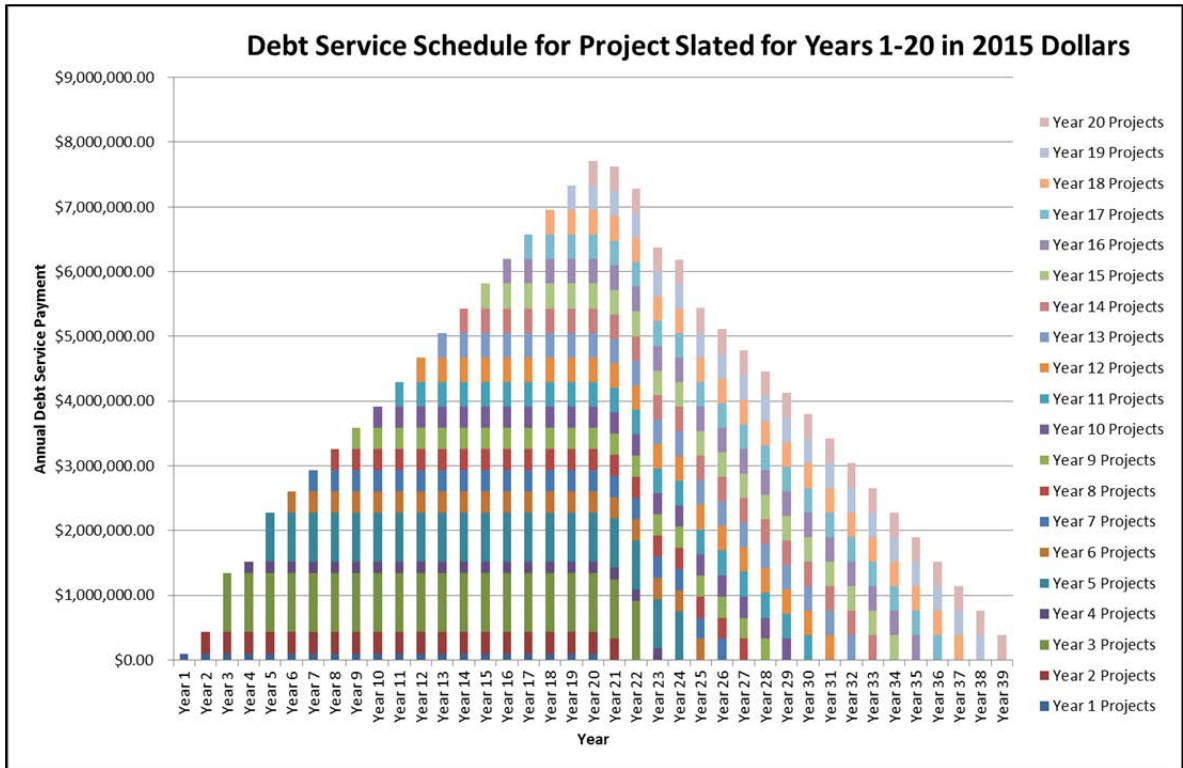


Figure 4-1 20-Year Annual Estimated Capital Cost Needs (2015 Dollars)

Figure 4-2 shows the anticipated annual debt service for these projects if the Town were to obtain SRF, or similar, funding (20-year, 2% loans) for the projects. (It should be noted that certain aspects of proposed projects, such as design, are not fundable through the SRF program. It was assumed for this study that a similar rate loan would be obtained for these portions of the project.)

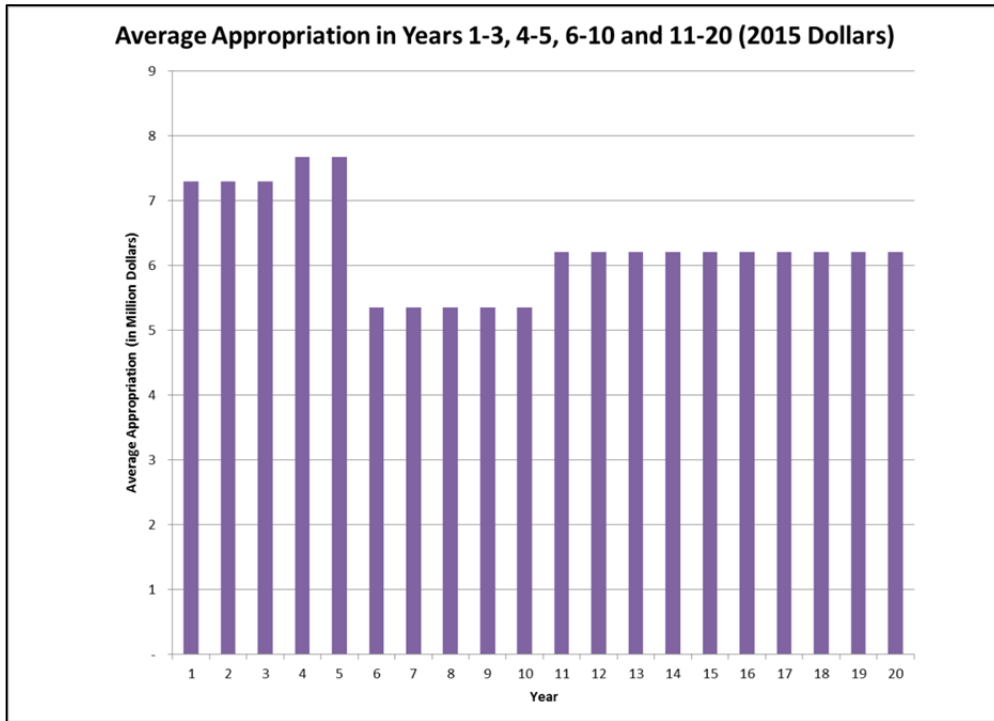


Figure 4-2 Debt Service Schedule for Projects Slated for Years 1 to 20 (2015 Dollars)

4.2 Financing Plan for Projects Slated for Years 1-5

A five-year plan has a short-term timeframe and focuses on the immediate needs of the infrastructure. The five-year expenditure analysis illustrates the need for replacement of numerous assets. A potential schedule for the projects slated for years 1 to 5 is described below and outlined in Figure 4-3.

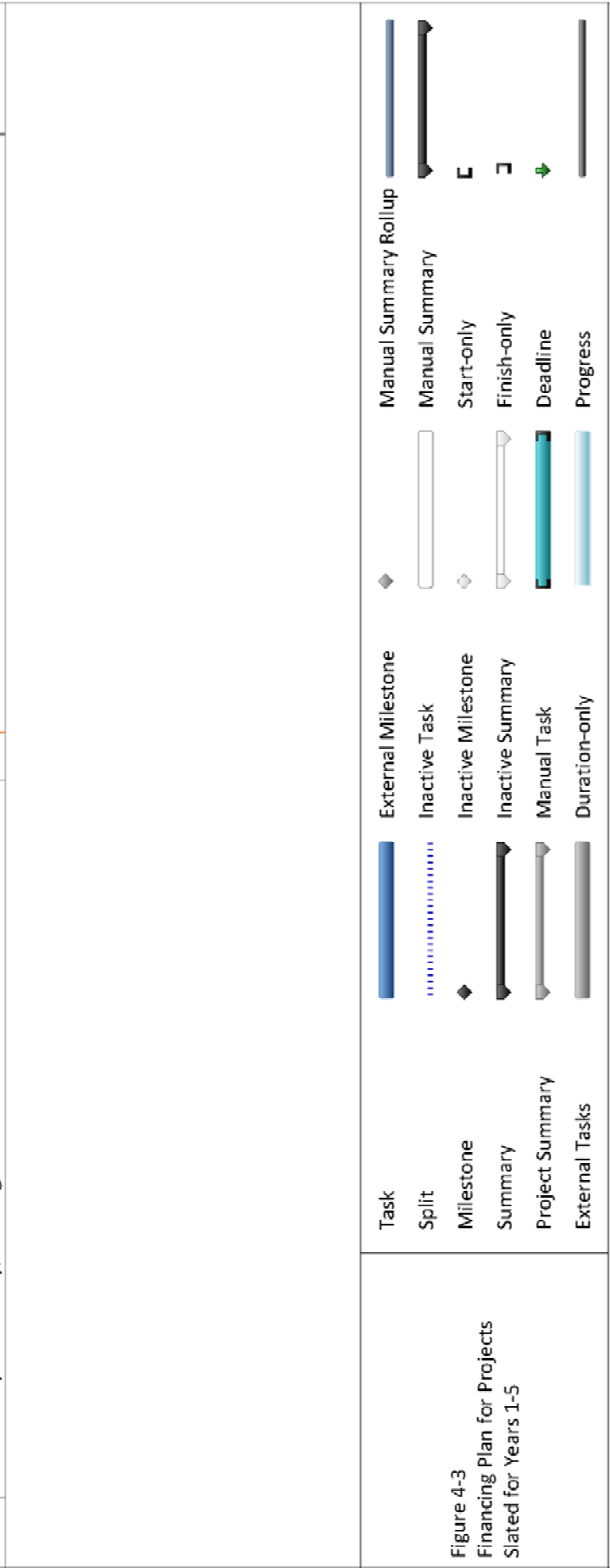
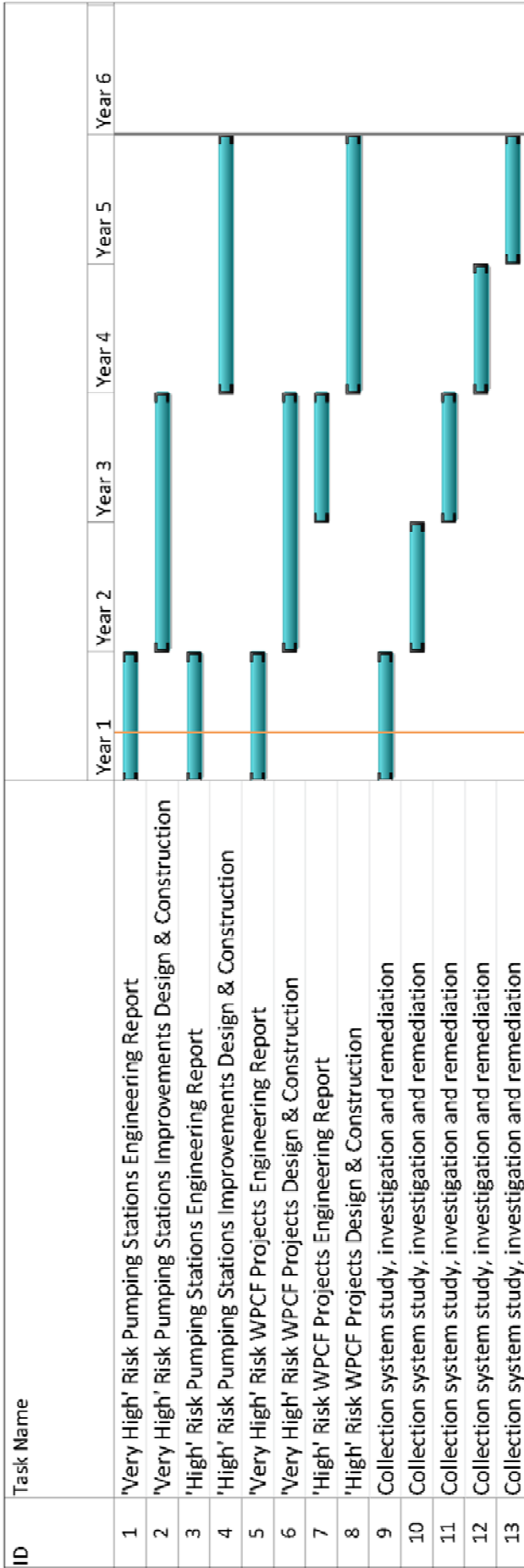


Figure 4-3
Financing Plan for Projects
Slated for Years 1-5

Figure 4-3 Financing Plan for Projects Slated for Years 1 to 5

4.2.1 Collections System Projects

The condition of much of the Town's collection system is unknown. It is recommended that the Town implement an annual investigation and rehabilitation program in order to assess the condition of the collection system.

4.2.2 Pumping Station Projects

Approximately 20% of the Town's pumping stations have a Very High criticality rating and contain mechanical equipment well past its useful life. An additional 45% of the pumping stations received a High criticality rating. It is recommended an Engineering Report¹ for all stations classified as Very High or High in order to prioritize replacement of mechanical equipment in the stations. An Engineering Report is used to identify remedies for long-standing problems in a particular area of infrastructure. The Engineering Report should consider the infrastructure's existing capacity and evaluate any additional flows that may be expected due to known developments or as identified as part of the Comprehensive Wastewater Management Planning (CWMP) process. The Engineering Report should also assess the integrity of the pumping stations' architectural and structural features.

In Year 1, conduct an Engineering Report for pumping stations with a Very High criticality rating. Prioritize stations with a High criticality for years 4 and 5, and 6 through 10. The Engineering Report should consider future pump station flows and necessary improvements due to capacity and/or condition.

In Years 2 and 3, design and construct improvements identified in the Engineering Report for the Very High criticality stations (listed below):

- Narrows
- Depot Street
- Dick's Pond
- Cohasset Narrows
- East Boulevard
- Minot
- Onset Heights
- Springborne

In Year 3, conduct an Engineering Report for the pumping stations which have a High criticality rating.

In Years 4 and 5, design and construct improvements identified in the Engineering Report for prioritized High criticality stations (all High criticality pumping stations are listed below):

- Kennedy Lane
- Hynes Field
- Onset Pier
- South Water Street
- Pine Tree Estates
- Smith

¹ An Engineering Report is typically the most basic requirement that MassDEP requires be submitted with a State Revolving Fund (SRF) application for project funding.

- Nanumette Air Station
- North Boulevard
- South Boulevard
- Pinehurst
- Bay Street
- Green Street
- Peter Cooper
- Woodbury
- Hill Street Jefferson Shores
- Saltworks Road
- Riverside
- Linwood
- Briarwood

4.2.3 Water Pollution Control Facility Projects

Very High and High criticality projects were noted during site visits and in discussions with WPCF staff. The following schedule is recommended to address these projects:

Year 1 – Condition evaluation for projects identified as Very High criticality.

Years 2 and 3 – Design and construct improvements identified on the condition evaluation for Very High criticality projects.

Year 3 – Condition evaluation for projects identified as High criticality

Years 4 and 5 – Design and construct improvements identified during the condition evaluation for High criticality projects.

4.2.4 Five-Year Capital Improvement Plan

The proposed project breakdown structure is outlined in Figure 4-4. All costs are shown in 2015 dollars. If these figures are used in any Town planning documents, an appropriate inflation figure should be applied.

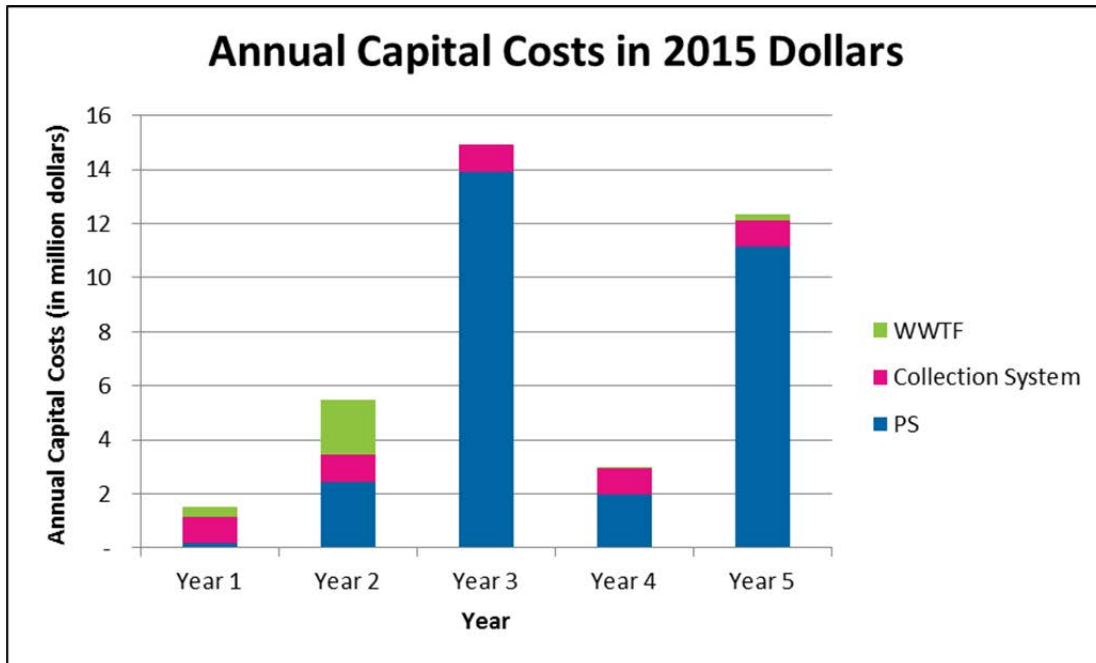


Figure 4-4 Capital Cost Needs for Projects Slated in Years 1 to 5 (2015 Dollars)

Figure 4-5 shows the anticipated annual debt service for the WPCF, collection system, and pumping station projects if the Town were to obtain SRF funding (20-year, 2% loans) for the projects. The figure only shows debt service for the project within Years 1 through 5. (It is noted that certain aspects of proposed projects, such as design, are not fundable through the SRF program. It was assumed for this study that a similar rate loan would be obtained for these portions of the project.)

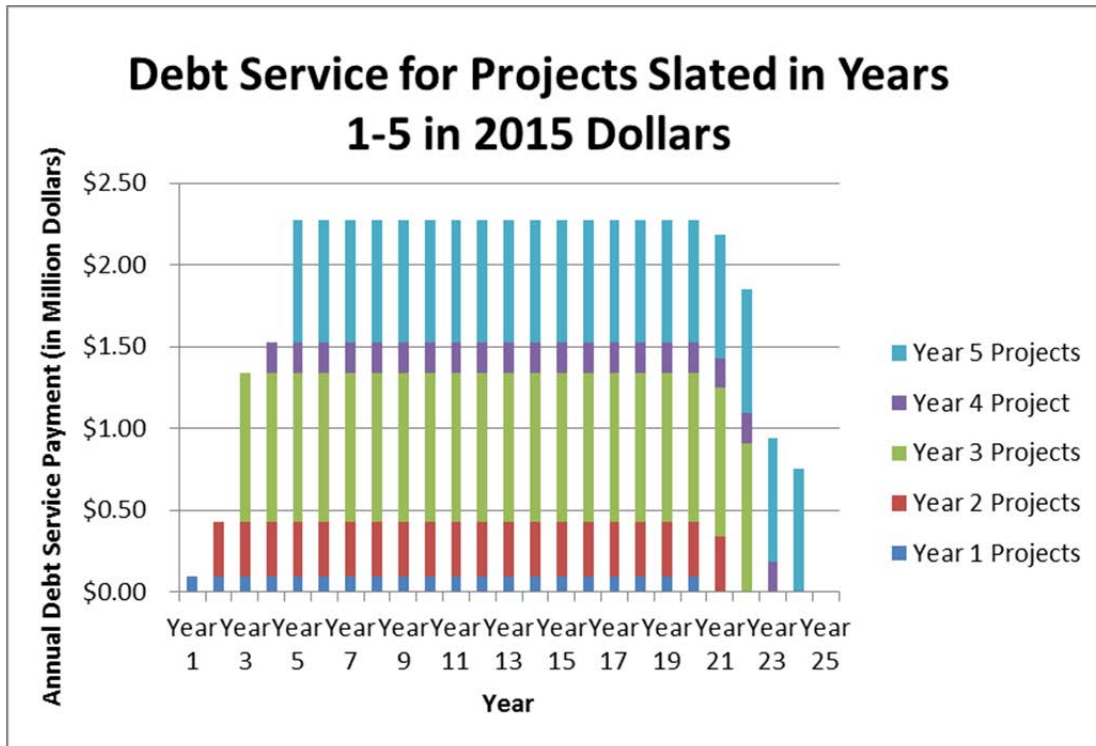


Figure 4-5 Debt Service for Years 1 to 5 (2015 Dollars)

5. Recommendations and Next Steps

This CIP identifies the capital costs anticipated to maintain the current level of service for the Town of Wareham's sewer infrastructure. As documented in the report, a sizeable portion of the Town's wastewater equipment is either well past or approaching the end of its useful life.

The projects recommended in the 20-year CIP are divided into four timeframes based on the criticality of the project. The 20-year CIP is a technical evaluation documenting the current state of the Town's infrastructure which will need to be updated at least every five years. The CIP should be coordinated with the rate study, currently being undertaken by the Town, for consistency.

A five-year CIP was also developed, with a short-term focus of addressing immediate infrastructure needs. It is recommended the following project schedule be implemented in Years 1 through 5:

5.1 Year 1

1. Implement an annual budget for an investigation and rehabilitation program of the Town's collection system.
2. Conduct an Engineering Report for Very High criticality pumping stations (Narrows, Depot Street, Dick's Pond, Cohasset Narrows, East Boulevard, Minot, Onset Heights, and Springborne).
3. Conduct an Engineering Report for High criticality pumping stations to prioritize for Years 4 and 5 (Kennedy Lane, Hynes Field, Onset Pier, South Water Street, Pine Tree Estates, Smith, Nanumette Air Station, North Boulevard, South Boulevard, Pinehurst, Bay Street, Green Street, Peter Cooper, Woodbury, Hill Street Jefferson Shores, Saltworks Road, Riverside, Linwood, and Briarwood).
4. Conduct an Engineering Report for Very High criticality WPCF projects

5.2 Year 2

1. Continue annual investigation and rehabilitation program for the Town's collection system.
2. Begin design and construction of Very High criticality WPCF projects.
3. Begin design and construction of Very High criticality pumping station improvement projects.

5.3 Year 3

1. Continue annual investigation and rehabilitation program for the Town's collection system.
2. Continue construction of Very High criticality WPCF projects.
3. Continue construction of Very High criticality pumping station improvement projects.
4. Conduct an Engineering Report of High criticality WPCF projects.
5. Conduct an Engineering Report of High criticality pumping stations.

5.4 Year 4

1. Continue annual investigation and rehabilitation program for the Town's collection system.

2. Begin design and construction of High criticality WPCF projects.
3. Begin design and construction of High criticality pumping station improvement projects

5.5 Year 5

1. Continue annual investigation and rehabilitation program for the Town's collection system.
2. Continue construction of High criticality WPCF projects.
3. Continue construction of High criticality pumping station improvement projects.

To fund the projects outlined in the 20-year CIP, it is recommended the Town develop a financing plan that is incorporated into user rates. Appropriate inflation factors should be applied to all costs presented in this report when the financing and rate plan is developed.

This report: has been prepared by GHD for Town of Wareham, Massachusetts and may only be used and relied on by Town of Wareham, Massachusetts for the purpose agreed between GHD and the Town of Wareham, Massachusetts as set out the scope of work for this project.

GHD otherwise disclaims responsibility to any person other than Town of Wareham, Massachusetts arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Town of Wareham, Massachusetts and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

GHD has prepared the preliminary cost estimate set out in section 4 of this report ("Cost Estimate") using information reasonably available to the GHD employee(s) who prepared this report; and based on assumptions and judgments made by GHD .

The Cost Estimate has been prepared for the purpose of capital improvement planning and must not be used for any other purpose.

The Cost Estimate is a preliminary estimate only. Actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. Unless as otherwise specified in this report, no detailed quotation has been obtained for actions identified in this report. GHD does not represent, warrant or guarantee that the [works/project] can or will be undertaken at a cost which is the same or less than the Cost Estimate.

Where estimates of potential costs are provided with an indicated level of confidence, notwithstanding the conservatism of the level of confidence selected as the planning level, there remains a chance that the cost will be greater than the planning estimate, and any funding would not be adequate. The confidence level considered to be most appropriate for planning purposes will vary depending on the conservatism of the user and the nature of the project. The user should therefore select appropriate confidence levels to suit their particular risk profile.

Appendices

Appendix A – Pumping Station Condition Assessments
Compiled by Town of Wareham WPCF Staff

PUMP STATION CONDITION ASSESSMENT

Pump Station: O-NE-SET
 Address: ONESET Heights
OASER MA

Inspection Date: 9-10-11
 Inspected By: B. Ma

GENERAL INFORMATION

Year Facility Constructed: 1996 Year Facility Modified: _____
 Facility Description: 2 metal enclosures 1 for Generator 1 for ELEC equipment
precast wetwell concrete

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: NO
 Pump #1: 1996 Motor #1: _____
 Year Installed: _____ Year Installed: _____
 Manufacturer: FLYST Manufacturer: _____
 Model and No.: CP3102MT s/n 3102.0909720011 Model and No.: _____
 Type: Submersible Type: _____
 NOM efficiency: _____ Horsepower: _____
 Design capacity/TDH: _____ Efficiency: _____
 Pump RPM: _____ Inverter duty: _____
 Valve size and type: 4" 6" check valve 4" ISOLATION Variable/Constant: _____
 Observed flow: _____ Vertical/Horizontal: _____
 Observed TDH: _____ Motor RPM: _____
 Comments: 30 Amp Breaker Pump curve available: _____

Pump #2: SAME ↑ Motor #2: _____
 Year Installed: _____ Year Installed: _____
 Manufacturer: _____ Manufacturer: _____
 Model and No.: _____ Model and No.: _____
 Type: _____ Type: _____
 NOM efficiency: _____ Horsepower: _____
 Design capacity/TDH: _____ Efficiency: _____
 Pump RPM: _____ Inverter duty: _____
 Valve size and type: _____ Variable/Constant: _____
 Observed flow: _____ Vertical/Horizontal: _____
 Observed TDH: _____ Motor RPM: _____
 Comments: 50 Amp Breaker Pump curve available: _____

ONESET + Riverside SISTER STATIONS
Pump SAME

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments:

Replace 30 amp Breaker for P1 w/A 50 amp
Breaker like Pump #2

Previous Pump Tests:

Replace metal cabinets - 5000 -
Electrical multitrode - 5000 -
10,000

OTHER PIPING AND VALVES

Air relief valves:

N/A

Excellent Good Fair Poor

Isolation valves:

LUBE + EXERCISE

Excellent Good Fair Poor

Piping:

4"

Excellent Good Fair Poor

Comments:

4" Piping in Manhole - LUBE + EXERCISE, add to schedule every 1/4

ELECTRICAL SYSTEMS INSPECTION

Location Classification:

Dry Location
Wet or Damp Location
Wet Corrosive Location

Comments:

Standby Generator:

Mnfr: Genenc/Olympian
Model: 9GA07032-S
Year Installed: 1999
Rating:
Fuel Type: N/GAS

Excellent Good Fair Poor

Facility Load:

Ample capacity (Y/N):

Interior Lighting Type:

Incandescent

Excellent Good Fair Poor

Lighting Level:

Excellent Good Fair Poor

Exterior Lighting Type:

N/A

Excellent Good Fair Poor

Panel Boards:

Excellent Good Fair Poor

Motor Control Center:

Excellent Good Fair Poor

Disconnect Switches:

Excellent Good Fair Poor

Lightning Protection:

Excellent Good Fair Poor

Fire Alarm System:

Excellent Good Fair Poor

Security System:

Excellent Good Fair Poor

Potential Code Issues:

Comments:

upgrade 30 amp Breaker

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: hourmeters

Pressure Gauges: _____

Other: _____

SCADA: Mission

Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: _____

Heating Type: STRIP Electric

Ventilation Type: _____

AC System Type: _____

Dehumidification: _____

Louvers: _____

Comments: _____

Fuel Storage Capacity: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation

1. upgrade to 50 Amp

2. Breaker

3. _____

4. _____

5. _____

Estimated Capital Project Cost

\$	<u>1000</u>
\$	
\$	
\$	
\$	
\$	
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation

1. _____

2. _____

3. _____

4. _____

5. _____

Estimated Capital Project Cost

\$	
\$	
\$	
\$	
\$	
\$	
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation

1. _____

2. _____

3. _____

4. _____

5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Apple ST
 Address: _____

Inspection Date: 9-1-13
 Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 2012 Year Facility Modified: _____
 Facility Description: Outside pump station

PUMP STATION EQUIPMENT

Number of Pumps: 2
 Pump #1:
 Year Installed: 2012
 Manufacturer: FLYGT
 Model and No.: 3102.181
 Type: MT
 NOM efficiency:
 Design capacity/TDH: 34.204 @ 127.6 gpm
 Pump RPM: 1755
 Valve size and type: 4" Check
 Observed flow:
 Observed TDH:
 Comments: _____

Service Area: outside
 Motor #1:
 Year Installed: 2012
 Manufacturer: FLYGT
 Model and No.: 3102.181
 Type: MT
 Horsepower: 3.9
 Efficiency: 82%
 Inverter duty:
 Variable/Constant: Constant
 Vertical/Horizontal: Vertical
 Motor RPM: 1755
 Pump curve available: See attached

Pump #2:
 Year Installed: Same As Above
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____
 Comments: _____

Motor #2:
 Year Installed: Same as Above
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: _____

Previous Pump Tests: _____

New

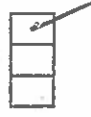
OTHER PIPING AND VALVES

Air relief valves: _____
 Isolation valves: 4" Gate
 Piping: _____
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location



Comments: _____

Standby Generator: Mfr: Generac
 Model: _____
 Year Installed: 2011
 Rating: 35 KW
 Fuel Type: Natural Gas

Excellent	Good	Fair	Poor
-----------	------	------	------

Facility Load:
 Ample capacity (Y/N): _____

Interior Lighting Type: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: N/A

Comments: _____

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: _____
 Pressure Gauges: _____
 Other: MISSING
 SCADA: _____
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: _____
 Heating Type: Small unit Electric in Cab,
 Ventilation Type: _____
 AC System Type: N/A
 Dehumidification: N/A
 Louvers: _____
 Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

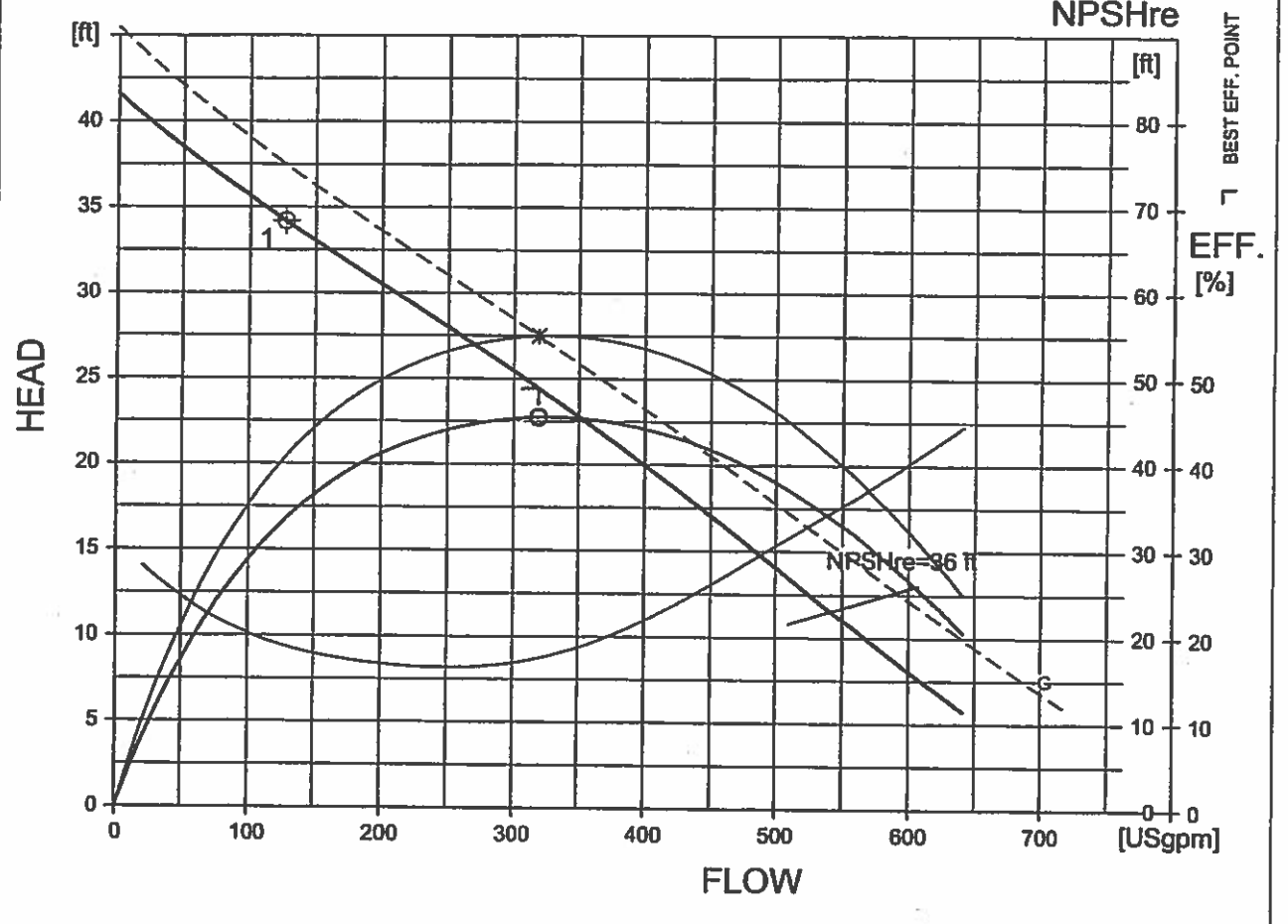
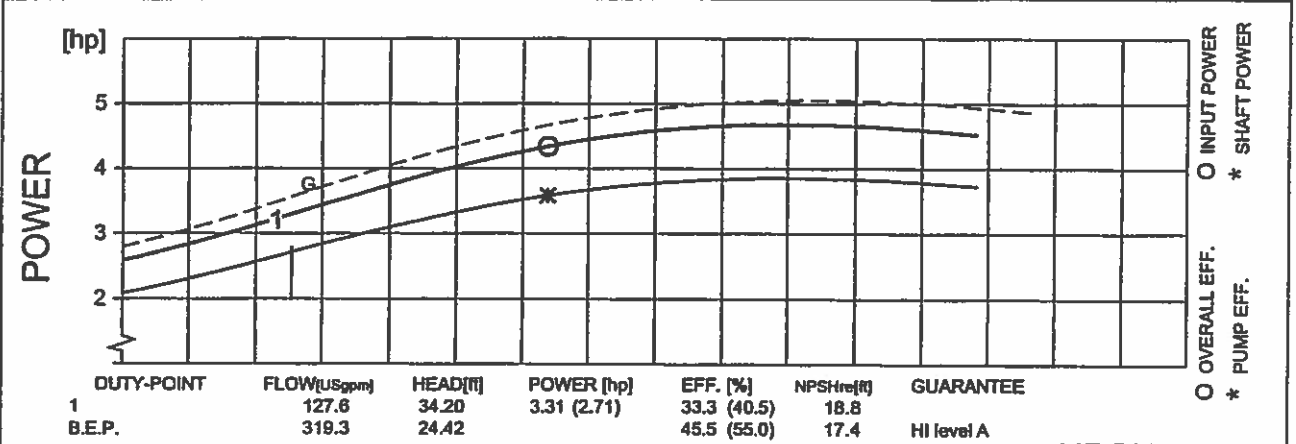
CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

FLYGT		PERFORMANCE CURVE			PRODUCT CP3102.181	TYPE MT
DATE 2012-03-01	PROJECT Apple St - Wareham, MA			CURVE NO 61-433-00-3003	ISSUE 2	
POWER FACTOR	1/1-LOAD 0.94	3/4-LOAD 0.95	1/2-LOAD 0.95	RATED POWER 3.9 hp	IMPELLER DIAMETER 168 mm	
EFFICIENCY	82.0 %	82.5 %	79.5 %	STARTING CURRENT ... 45 A	MOTOR # 18-11-4AL	STATOR REV 01-
MOTOR DATA	---	---	---	RATED CURRENT ... 16 A	FREQ. 60 Hz	PHASES 1
COMMENTS	INLET/OUTLET - / 4 inch			RATED SPEED 1755 rpm	VOLTAGE 230 V	POLES 4
NEVACLOG	IMP. THROUGHLET 2.9 inch			TOT.MOM.OF INERTIA ... 0.042 kgm2	GEARTYPE ---	RATIO ---
				NO. OF BLADES 1		



FLYPS3.1.6.6 (20090313)

NPSH_{re} = NPSH_{3%} + min. operational margin
 Performance with clear water and ambient temp 40 °C

GUARANTEE BETWEEN LIMITS (G) ACC. TO
HI level A

PUMP STATION CONDITION ASSESSMENT

Pump Station: Arnold Pump Station
Address: _____

Inspection Date: 8-31-13
Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 2006 Year Facility Modified: _____
Facility Description: outside pump station

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: outside

Pump #1:
Year Installed: 2006
Manufacturer: FLYGT
Model and No.: 3102.090
Type: MT
NOM efficiency: _____
Design capacity/TDH: 28.28TDH @ 333,26PM
Pump RPM: 1755
Valve size and type: 6" check
Observed flow: _____
Observed TDH: _____

Motor #1:
Year Installed: 2006
Manufacturer: FLYGT
Model and No.: _____
Type: MT
Horsepower: 3.9
Efficiency: _____
Inverter duty: _____
Variable/Constant: Constant
Vertical/Horizontal: VERTICAL
Motor RPM: 1755
Pump curve available: See Attached.

Comments: _____

Pump #2:
Year Installed: Same as Above
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #2:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: Overall Good -
Has a Sewage Air Release Valve 6"

multi probe stick - 2000 -
Clean Air Release Valve 5000
Paint cabinet - 5000
5000

Previous Pump Tests: _____

OTHER PIPING AND VALVES

Air relief valves: Should be checked 6"

Isolation valves: 6" GATE VALVES

Piping: _____

Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: Kohler
 Model: 20RE0258
 Year Installed: 2006
 Rating: 25 KW
 Fuel Type: Diesel

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Lighting Level: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Exterior Lighting Type: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Motor Control Center: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Disconnect Switches: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Lightning Protection: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: Recommend clearing fence line
Putting lolly columns around wetwell area that is outside of fence

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	<u>missions</u>	Excellent	<u>Good</u>	Fair	Poor
SCADA:	_____	Excellent	Good	Fair	Poor

Comments: multi-tube sticks should be replaced - has tape over it - works but may cause problems in future.

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	_____	Fuel Storage Capacity: _____			
Heating Type:	<u>Small ple. in cabinet</u>	Excellent	<u>Good</u>	Fair	Poor
Ventilation Type:	_____	Excellent	<u>Good</u>	Fair	Poor
AC System Type:	<u>N/A</u>	Excellent	Good	Fair	Poor
Dehumidification:	<u>N/A</u>	Excellent	Good	Fair	Poor
Louvers:	_____	Excellent	<u>Good</u>	Fair	Poor
Comments:	_____	_____			

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Clear fence line</u>	\$
2. <u>Paint generator wood chip/weed whack</u>	\$
3. <u>Paint generator</u>	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

TEST REPORT

PRODUCT

Serial No. 3102.090		Performance curve No. 0620075		Motor module/type 61- 434-00-3003		Voltage (V) 130		230	
Base module 003	Impeller No. 438 96 01			Gear type	Gear ratio		Imp.diam/Blade angle 173		Water temp °C 16.0

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
48.17	0.0	1.77	232	8.7	0.00
43.85	46.3	1.93	232	9.3	19.89
40.29	107.2	2.22	232	10.5	36.61
36.11	182.4	2.60	232	12.1	47.72
34.74	209.9	2.74	232	12.7	50.23
31.58	271.5	3.02	232	13.9	53.54
28.28	333.2	3.26	232	15.0	54.56
23.80	412.5	3.48	232	16.1	53.20

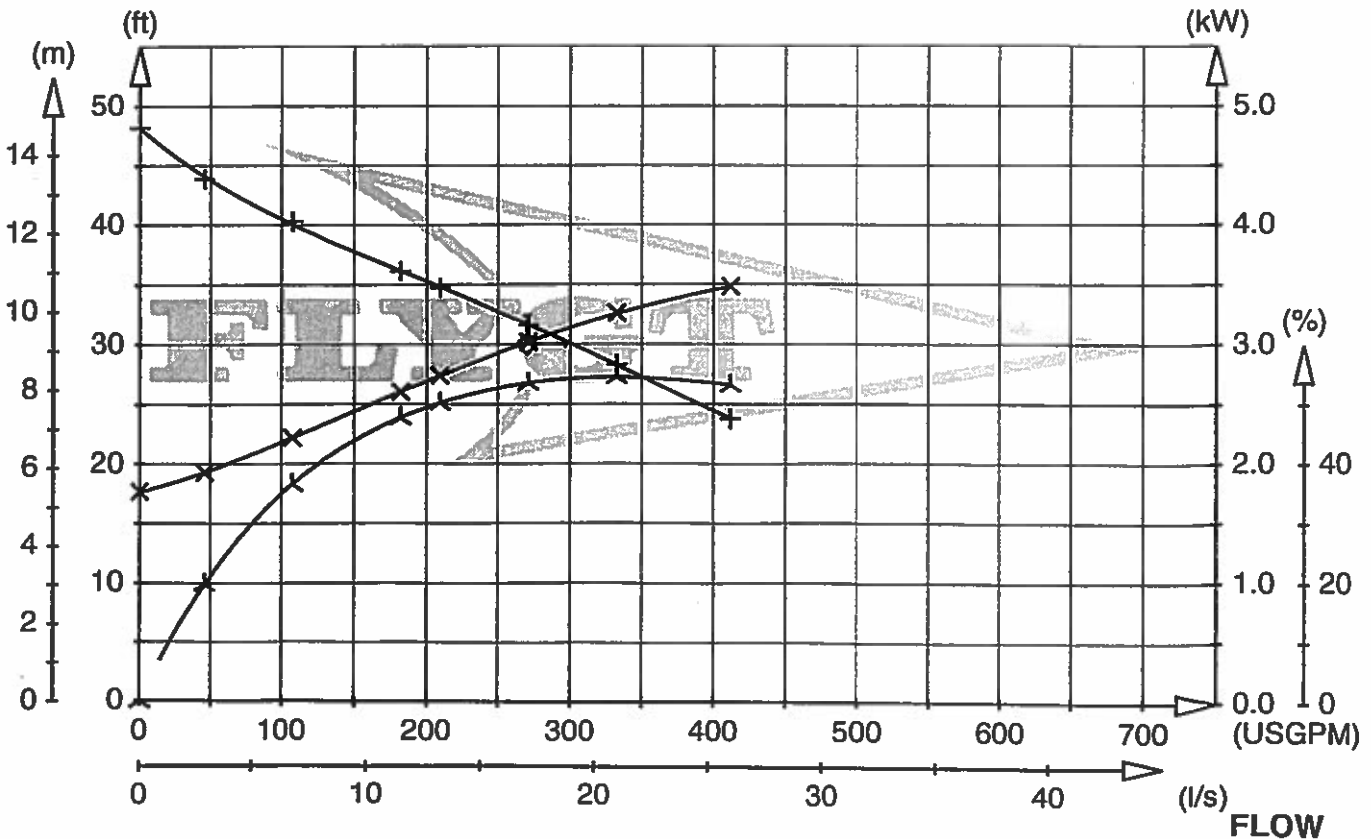
Accepted after HI	Test facility Lindas Sweden	Test date LC3 06-03-01	Time 11:24	Chief tester 5325
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ORDERNR 162066 POS 1

PLOTTED TEST RESULTS Measured point : $+$ = Q/H \times = Q/P Duty point : \diamond = Q/H \square = Q/P Calculated point : \wedge = Q/ETA overall 6 \triangle = Q/ETA overall

TOTAL HEAD

INPUT POWER



TEST REPORT

PRODUCT

Serial No. 3102.090 0620073		Performance curve No. 61-434-00-3003		Motor module/type 130	Voltage (V) 230
Base module 003	Impeller No. 438 96 01	Gear type	Gear ratio	Imp.diam/Blade angle 173	Water temp °C 16.0

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
47.87	0.0	1.79	233	8.8	0.00
44.16	45.7	1.95	234	9.4	19.53
40.59	105.5	2.25	233	10.6	35.93
36.54	180.4	2.64	233	12.2	47.16
34.44	220.7	2.84	233	13.1	50.51
31.98	270.1	3.05	233	14.0	53.41
28.69	331.8	3.29	233	15.1	54.64
24.77	403.7	3.49	234	16.0	53.99



Accepted after	Test facility	Test date	Time	Chief tester
HI	Lindas LC3 Sweden	06-03-01	12:34	5306

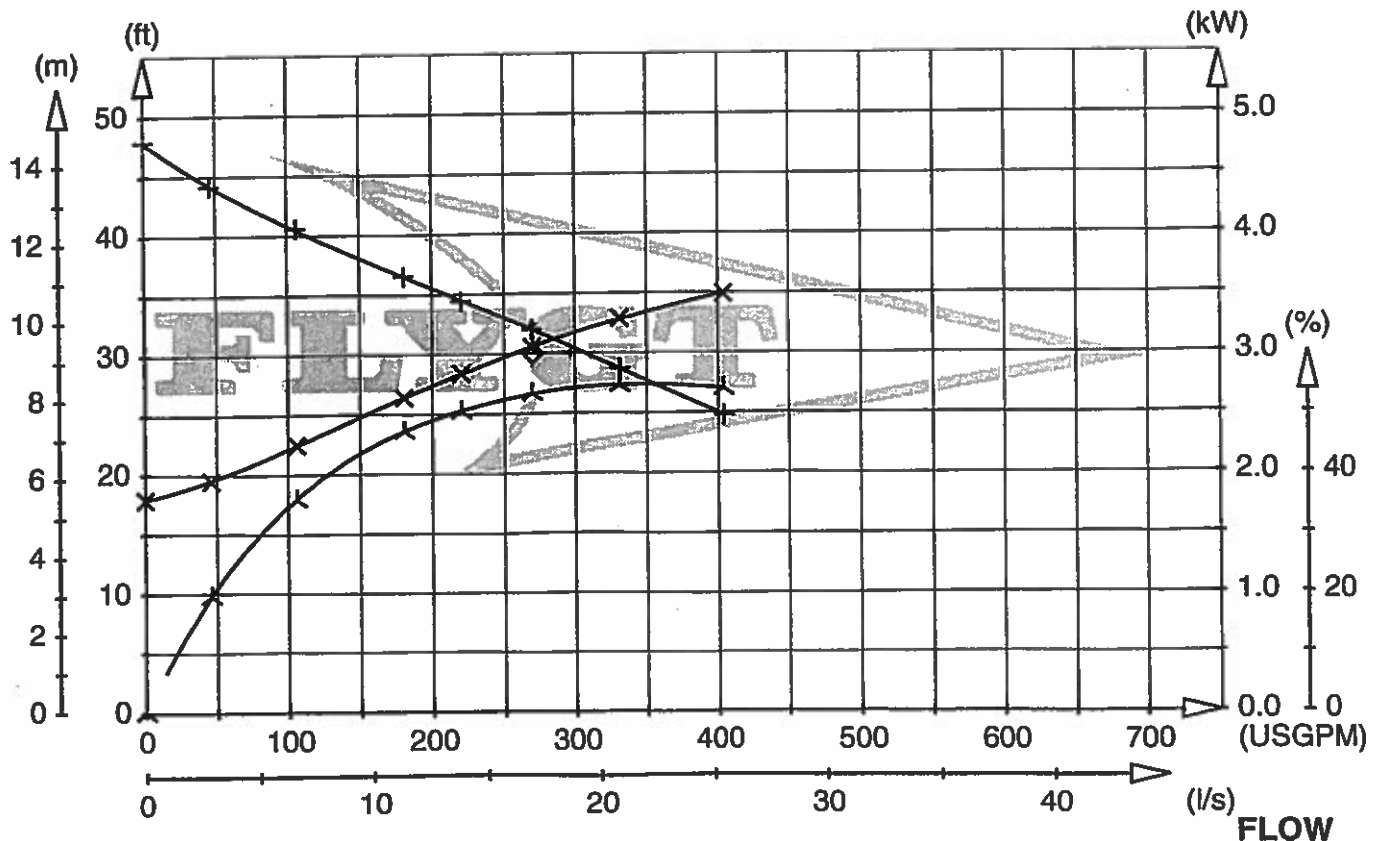
ORDERNR 162066 POS 1

PLOTTED TEST RESULTS

Measured point: + = Q/H Duty point: ◇ = Q/H
 X = Q/P □ = Q/P
 Δ = Q/ETA overall Calculated point: ʘ = Q/ETA overall

TOTAL HEAD

INPUT POWER



PUMP STATION CONDITION ASSESSMENT

Pump Station: Avenue A
Address: _____

Inspection Date: August 20, 2013
Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 2011 Year Facility Modified: _____
Facility Description: Pump Station (Open)

PUMP STATION EQUIPMENT

Number of Pumps: 2
Pump #1:
Year Installed: 2012
Manufacturer: FLYGT
Model and No.: NP3102.09D
Type: MT Submersible
NOM efficiency: _____
Design capacity/TDH: 31'
Pump RPM: 1755
Valve size and type: 4" Check Valve
Observed flow: _____
Observed TDH: _____

Service Area: _____
Motor #1:
Year Installed: 2012
Manufacturer: FLYGT
Model and No.: NP3102.09D
Type: MT Submersible
Horsepower: 3.9
Efficiency: 82%
Inverter duty: _____
Variable/Constant: VFD
Vertical/Horizontal: VERTICAL
Motor RPM: 1755
Pump curve available: See Attached

Comments: _____

Pump #2:
Year Installed: Same As Above
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #2:
Year Installed: Same As Above
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: Brand new station

Cut the stairs and Around Fence line to be cleared.
Paint Lally columns yellow
No Parking sign

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available _____

Comments: _____

General Station Comments: _____

Previous Pump Tests: _____

OTHER PIPING AND VALVES

Air relief valves: N/A
 Isolation valves: 4" Gate
 Piping: 4" DI
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: Generac
 Model: 12973240100
 Year Installed: 2011
 Rating: 35 KW
 Fuel Type: Natural GAS

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Lighting Level: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Exterior Lighting Type: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Panel Boards: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Motor Control Center: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Disconnect Switches: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Lightning Protection: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Security System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Potential Code Issues: _____

Comments: _____

N/A

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	<u>missions</u>	Excellent	Good	Fair	Poor
SCADA:	_____	Excellent	Good	Fair	Poor
Comments:	<u>new station</u>				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	_____	Fuel Storage Capacity: _____			
Heating Type:	<u>Small Heater Inside Control Panel</u>	Excellent	Good	Fair	Poor
Ventilation Type:	_____	Excellent	Good	Fair	Poor
AC System Type:	<u>N/A</u>	Excellent	Good	Fair	Poor
Dehumidification:	<u>N/A</u>	Excellent	Good	Fair	Poor
Louvers:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____



PERFORMANCE CURVE

PRODUCT
NP3102.181

TYPE
MT

DATE
2012-03-01

PROJECT
Avenue A - Wareham, MA

CURVE NO
61-465-00-3003

ISSUE
4

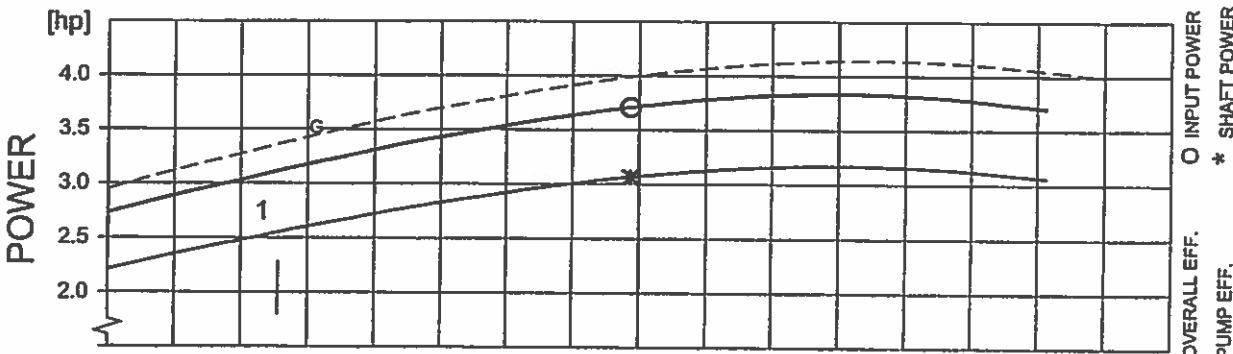
	1/1-LOAD	3/4-LOAD	1/2-LOAD
POWER FACTOR	0.94	0.95	0.95
EFFICIENCY	82.0 %	82.5 %	79.5 %
MOTOR DATA	—	—	—

RATED POWER	3.9	hp
STARTING CURRENT	45	A
RATED CURRENT	16	A
RATED SPEED	1755	rpm
TOT.MOM.OF INERTIA	0.026	kgm2
NO. OF BLADES	2	

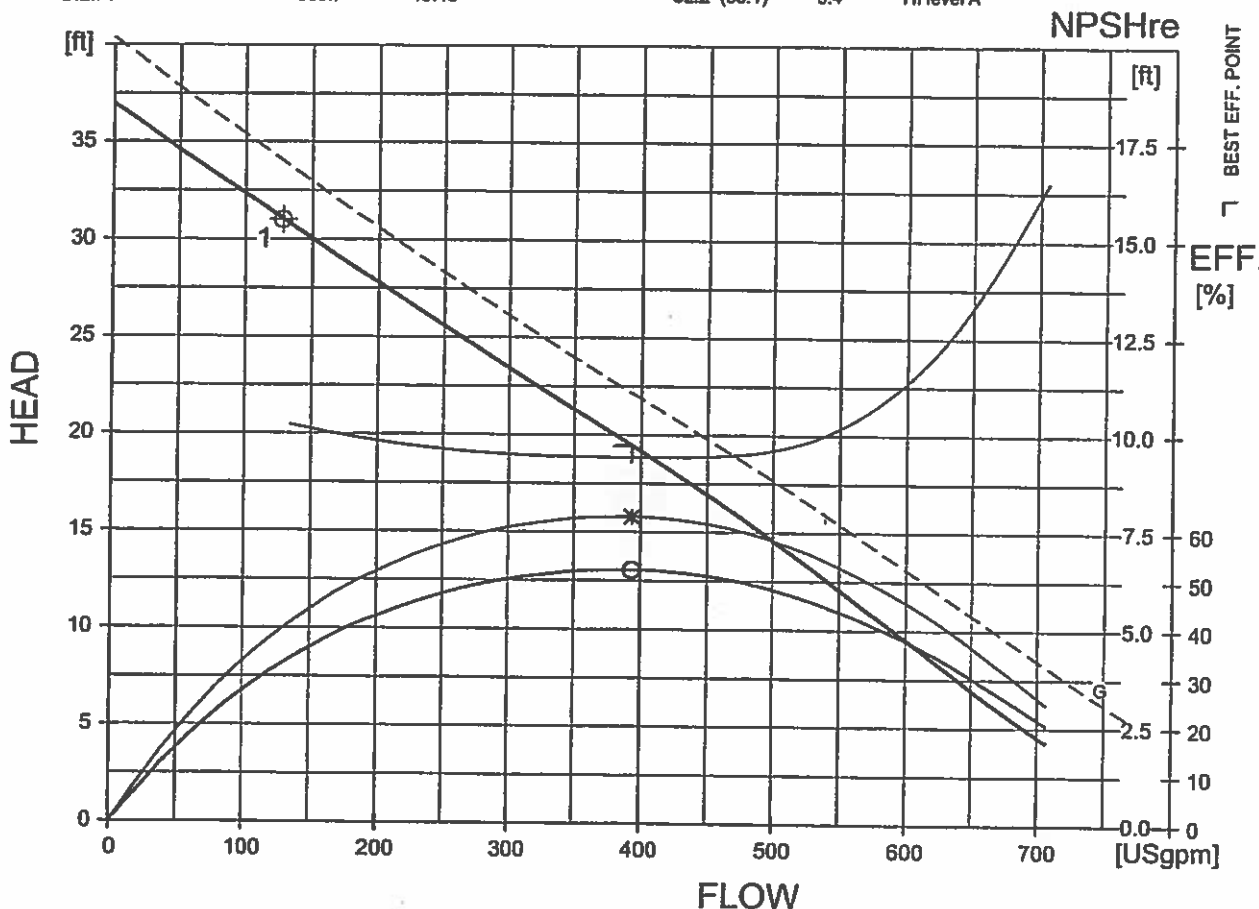
IMPELLER DIAMETER			
152 mm			
MOTOR #	STATOR	REV	
18-11-4AL	01-	12	
FREQ.	PHASES	VOLTAGE	POLES
60 Hz	1	230 V	4
GEARTYPE		RATIO	
—		—	

COMMENTS

INLET/OUTLET
- / 4 inch
IMP. THROUGHLET
—



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSH _{re} [ft]	GUARANTEE
1	128.3	31.00	3.11 (2.61)	32.3 (39.5)	9.4	Hi level A
B.E.P.	393.7	19.45		52.2 (63.1)		



FLYPS3.1.6.6 (20090313)

NPSH_{re} = NPSH_{3%} + min. operational margin
Performance with clear water and ambient temp 40 °C

GUARANTEE BETWEEN LIMITS (G) ACC. TO
Hi level A

PUMP STATION CONDITION ASSESSMENT

Pump Station:

BAY ST

Inspection Date:

8-16-13

Inspected By:

R. MA

Address:

DAY ST
DUNSET, MA

GENERAL INFORMATION

Year Facility Constructed:

1989

Year Facility Modified:

Facility Description:

CONCRETE VAULT UNDER STREET

PUMP STATION EQUIPMENT

Number of Pumps:

2

Service Area:

NO

Pump #1:

Year Installed:

1989

Motor #1:

Year Installed:

Manufacturer:

YEOMANS CHICAGO

Manufacturer:

Model and No.:

150-157

Model and No.:

Type:

PNEUMATIC

Type:

NOM efficiency:

Horsepower:

Design capacity/TDH:

150 gpm / 51 TDH

Efficiency:

Pump RPM:

Inverter duty:

Valve size and type:

4" Fairbanks Flapper + Check

Variable/Constant:

Observed flow:

Vertical/Horizontal:

Observed TDH:

Motor RPM:

Pump curve available:

Comments:

All wear Items replaced as needed

AIR Supplied from Nantuxette, LMTD @ IEC Components

Pump #2:

Year Installed:

SAME



Motor #2:

Year Installed:

Manufacturer:

Manufacturer:

Model and No.:

Model and No.:

Type:

Type:

NOM efficiency:

Horsepower:

Design capacity/TDH:

Efficiency:

Pump RPM:

Inverter duty:

Valve size and type:

Variable/Constant:

Observed flow:

Vertical/Horizontal:

Observed TDH:

Motor RPM:

Pump curve available:

Comments:

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: *Simply Desisnod STN in good cond.*
EASY to MAINTAIN

Previous Pump Tests: _____

metal Elec. Cabinet 2000 -
2000

OTHER PIPING AND VALVES

Air relief valves:	_____	Excellent	<u>Good</u>	Fair	Poor
Isolation valves:	_____	Excellent	<u>Good</u>	Fair	Poor
Piping:	_____	Excellent	Good	<u>Fair</u>	Poor

Comments: All W.W. Piping should be painted + sealed where it meets concrete.
AIR PIPING in GOOD SHAPE

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mnfr: _____
 Model: _____
 Year Installed: N/A
 Rating: _____
 Fuel Type: _____

Excellent Good Fair Poor

Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: _____
 Excellent Good Fair Poor

Lighting Level: _____
 Excellent Good Fair Poor

Exterior Lighting Type: N/A
 Excellent Good Fair Poor

Panel Boards: N/A
 Excellent Good Fair Poor

Motor Control Center: N/A
 Excellent Good Fair Poor

Disconnect Switches: DAMP CONDITIONS
 Excellent Good Fair Poor

Lightning Protection: N/A
 Excellent Good Fair Poor

Fire Alarm System: N/A
 Excellent Good Fair Poor

Security System: N/A
 Excellent Good Fair Poor

Potential Code Issues: _____

Comments: _____

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: N/A

Pressure Gauges: older, Low Bio type.

Other: _____

SCADA: MISSION
AIMMS only

Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A

Heating Type: WALL
E/EC HEATERS

Ventilation Type: N/A

AC System Type: N/A

Dehumidification: _____

Louvers: N/A

Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Briarwood Pump Station Inspection Date: 8-20-13
Address: _____ Inspected By: J. Waldron

GENERAL INFORMATION

Year Facility Constructed: 2006 Year Facility Modified: _____
Facility Description: _____

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: outside
Pump #1: _____ Motor #1: _____
Year Installed: 2006 Year Installed: 2006
Manufacturer: FLYGT Manufacturer: FLYGT
Model and No.: 3127.090 Model and No.: 3127.090
Type: HT Type: HT
NOM efficiency: _____ Horsepower: 7.5
Design capacity/TDH: 29.31 H @ 354.5 gpm Efficiency: _____
Pump RPM: 1745 Inverter duty: _____
Valve size and type: 6" Check Variable/Constant: Constant
Observed flow: _____ Vertical/Horizontal: Vertical
Observed TDH: _____ Motor RPM: 1745
Pump curve available: See Attached.
Comments: _____

Pump #2: _____ Motor #2: _____
Year Installed: Same As Above Year Installed: Same As Above
Manufacturer: _____ Manufacturer: _____
Model and No.: _____ Model and No.: _____
Type: _____ Type: _____
NOM efficiency: _____ Horsepower: _____
Design capacity/TDH: _____ Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: _____ Variable/Constant: _____
Observed flow: _____ Vertical/Horizontal: _____
Observed TDH: _____ Motor RPM: _____
Pump curve available: _____
Comments: _____

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available _____

Comments: _____

General Station Comments: _____

Previous Pump Tests: _____

*Paint cabinet
~~500~~
500 -*

OTHER PIPING AND VALVES

Air relief valves: N/A

Isolation valves: 6" Gate valve

Piping: _____

Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: GenSet
 Model: DG BB-5781264
 Year Installed: 2006
 Rating: 35KW
 Fuel Type: Diesel

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Facility Load: _____
 Ample capacity (Y/N): Y

Interior Lighting Type: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Lighting Level: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Exterior Lighting Type: None - outdoor station

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Panel Boards: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Motor Control Center: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Disconnect Switches: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Lightning Protection: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Security System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Potential Code Issues: N/A

Comments: _____

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	<u>MISSING</u>	Excellent	<u>Good</u>	Fair	Poor
CADA:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	<u>Diesel tank under generator</u>	Fuel Storage Capacity:	_____		
Heating Type:	<u>Small unit in cabinet</u>	Excellent	<u>Good</u>	Fair	Poor
Ventilation Type:	_____	Excellent	<u>Good</u>	Fair	Poor
AC System Type:	<u>N/A</u>	Excellent	Good	Fair	Poor
Dehumidification:	<u>N/A</u>	Excellent	Good	Fair	Poor
Louvers:	_____	Excellent	<u>Good</u>	Fair	Poor
Comments:	_____				

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Put PISTONS on steel grate - very heavy</u>	\$
2. <u>Paint cabinet</u>	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Replace pumps</u>	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____



TEST REPORT

PRODUCT

Serial No. 3127.090 0640169		Performance curve No. 61- 463-00-3006		Motor module/type 130	Voltage (V) 230
Base module 006	Impeller No. 430 11 00	Gear type	Gear ratio	Imp.diam/Blade angle 231	Water temp °C 19.2

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
67.93	0.0	3.57	233	15.6	0.00
64.08	39.1	3.98	233	17.4	11.90
61.56	94.2	4.49	233	19.7	24.37
55.94	165.5	4.98	233	21.9	35.09
48.40	227.8	5.15	233	22.7	40.39
42.32	271.2	5.22	233	23.0	41.51
29.31	354.5	5.03	233	22.2	38.99
13.24	448.5	4.65	233	20.4	24.12

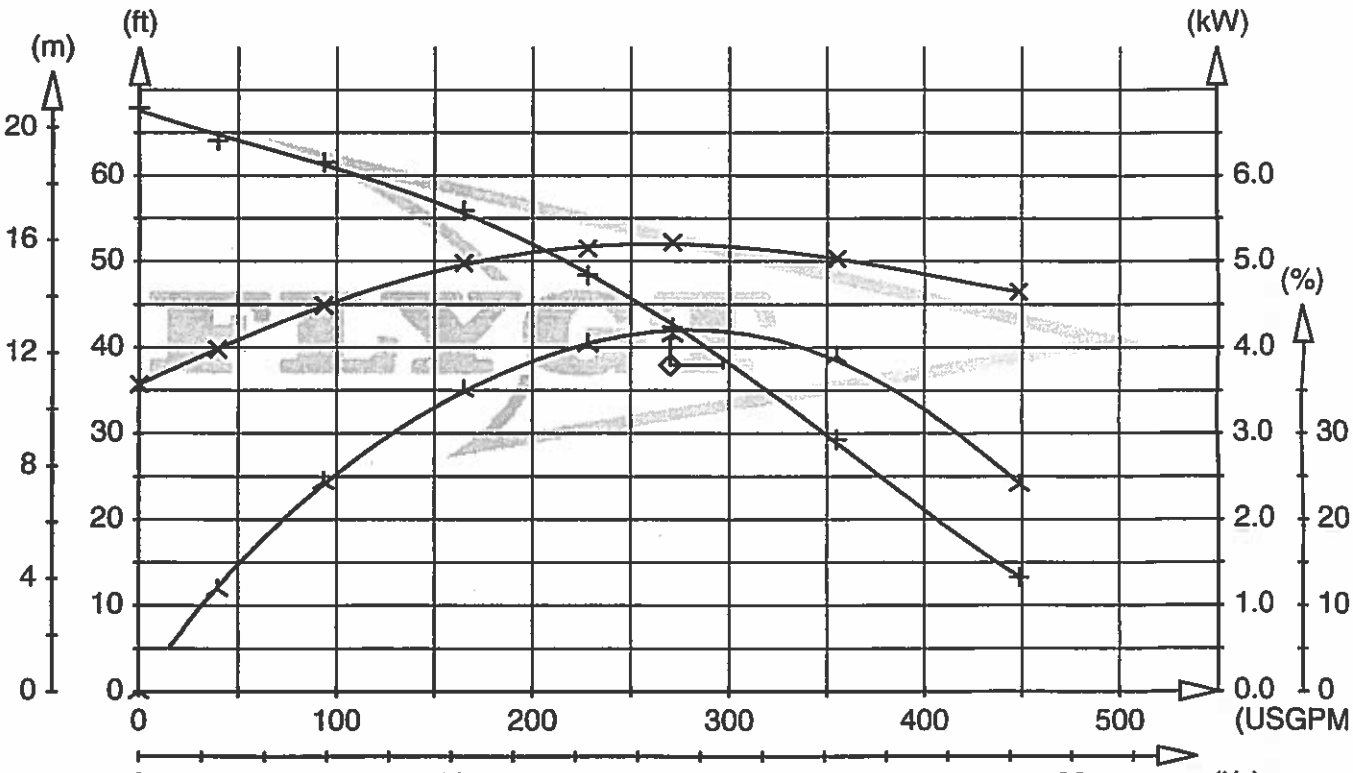
Accepted after HI	Test facility Lindas LC1 Sweden	Test date 06-06-07	Time 14:00	Chief tester 5307
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ORDERNR 168877 POS 1

PLOTTED TEST RESULTS Measured point : \pm = Q/H Duty point : \diamond = Q/H
 \times = Q/P \square = Q/P Calculated point : \wedge = Q/ETA overall
 \triangle = Q/ETA overall 6

TOTAL HEAD

INPUT POWER



PUMP STATION CONDITION ASSESSMENT

Pump Station: Cohasset Narrows
 Address: CRAWBERRY Hwy
Bozards Bay MA

Inspection Date: 8-17-13
 Inspected By: [Signature]

GENERAL INFORMATION

Year Facility Constructed: 1989
 Year Facility Modified: _____
 Facility Description: Concrete Block structure w/Asphalt Roof Shingles, Cedar siding
wetwell side, and 3 level Pump + Elec side.

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: yes
 Pump #1: S/N K3T1-059965 Motor #1: _____
 Year Installed: 1989 Year Installed: 1989
 Manufacturer: Fairbanks Morse Manufacturer: MARATHON
 Model and No.: R5404 4" Model and No.: S/N K3T1-059965
 Type: NONCLOG CENTRIFUGAL Type: _____
 NOM efficiency: _____ Horsepower: 40
 Design capacity/TDH: _____ Efficiency: _____
 Pump RPM: _____ Inverter duty: _____
 Valve size and type: MHV+F CO. VALVES, Ariston A1A. Variable/Constant: VFD CONTROLLED
 Observed flow: _____ Vertical/Horizontal: Vert
 Observed TDH: _____ Motor RPM: 1200
 Pump curve available: _____

Comments: VFD^s INSTALLED 2004 YAKASAWA (GOOD) MOTORS in GOOD CONDITION

PUMPS SHOULD BE PAINTED

Pump #2: SAME ↑
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #2: SAME ↑
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: Both Pumps have had seals, bearings, shafts etc replaced 2002/2003 wear items.

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: N/A
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: N/A
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available _____

Comments: _____

General Station Comments: EMERGENCY LIGHTING should be replaced.
ROOF SHOULD BE REPLACED, TRIM BOARDS Paint + replace
AS Necessary
Generator ~~5000~~ needs replacing -
NEW FLOAT SHOULD BE ADDED to wet well (High Angle)
to START + STOP Pumps in the event mercoid fails.

Previous Pump Tests: _____

ON the WATER
ALSO

generator 5000 -
emergency lighting 3000 -
Roof 5000 -
Trim-wood 7000 -
Paint / Heating system
80,000
100,000

OTHER PIPING AND VALVES SHOULD BE PAINTED

Air relief valves: N/A Excellent Good Fair Poor

Isolation valves: MHV + FCO, 2" VALVES Excellent Good Fair Poor

Piping: 8" Excellent Good Fair Poor

Comments: PIPES + VALVES NEED PAINT, All in Good order
ISOLATION VALVES IN WET WELL FROZEN

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: Ford / LEROY SOMER
 Model: LSG-8751 / LSA 42-44
 Year Installed: 1989
 Rating: _____
 Fuel Type: N/E

24 hrs

Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: <u>Flourescent</u>	Excellent	<u>Good</u>	Fair	Poor
Lighting Level: _____	Excellent	Good	Fair	Poor
Exterior Lighting Type: <u>Sodium Type</u>	Excellent	<u>Good</u>	Fair	Poor
Panel Boards: _____	Excellent	<u>Good</u>	Fair	Poor
Motor Control Center: _____	Excellent	<u>Good</u>	Fair	Poor
Disconnect Switches: _____	Excellent	<u>Good</u>	Fair	Poor
Lightning Protection: _____	Excellent	Good	Fair	Poor
Fire Alarm System: _____	Excellent	<u>Good</u>	Fair	Poor
Security System: <u>N/A</u>	Excellent	Good	Fair	Poor

Potential Code Issues: _____

Comments: OUTSIDE FIEC BOX should be painted
GENERATOR AKA SUPERIOR MOD # 7SR461

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Monerwell
 Pressure Gauges: AS BACKUP to new mercoid level control
 Other: _____
 SCADA: MISSION N/A

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Comments: Mercoid Level control + sensor installed 2013 Air Bubbler system is now IS/V Level control

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/G
 Heating Type: Forced Hot Air N/G
 Ventilation Type: _____
 AC System Type: N/A
 Dehumidification: 2 units N/G
 Louvers: CARBON

Fuel Storage Capacity: UTILITY

Excellent	Good	Fair	<u>< Poor</u>
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	<u>< Poor</u>
Excellent	Good	Fair	Poor

Comments: New guarantee for wetwell ventilation MORE WORK needs to be done BY MECHANICAL CONTRACTOR

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

- Item/Recommendation
- Replace E. Lightings
 - Wetwell Ventilation
 - _____
 - _____
 - _____

Estimated Capital Project Cost

\$	<u>2000.00</u>
\$	
\$	
\$	
\$	
\$	
\$	
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

- Item/Recommendation
- Replace Asphalt Roof
 - _____
 - _____
 - _____
 - _____

Estimated Capital Project Cost

\$	<u>4000.00</u>
\$	
\$	
\$	
\$	
\$	
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

- Item/Recommendation
- _____
 - _____
 - _____
 - _____
 - _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Cromesett Rd
Address: _____

Inspection Date: 8-20-13
Inspected By: J. Waldron

GENERAL INFORMATION

Year Facility Constructed: 2012 Year Facility Modified: _____
Facility Description: Outside Pump Station

PUMP STATION EQUIPMENT

Number of Pumps: <u>2</u>	Service Area: <u>outside</u>
Pump #1:	Motor #1:
Year Installed: <u>FLYGT 2012</u>	Year Installed: <u>2012</u>
Manufacturer: <u>FLYGT</u>	Manufacturer: <u>FLYGT</u>
Model and No.: <u>CP3127.181</u>	Model and No.: <u>CP3127.181</u>
Type: <u>HT</u>	Type: <u>HT</u>
NOM efficiency:	Horsepower: <u>7.5</u>
Design capacity/TDH: <u>55'</u>	Efficiency: <u>83%</u>
Pump RPM: <u>1745</u>	Inverter duty:
Valve size and type: <u>4" check valve</u>	Variable/Constant: <u>Constant</u>
Observed flow:	Vertical/Horizontal: <u>Vertical</u>
Observed TDH:	Motor RPM: <u>1745</u>
	Pump curve available: <u>Attached</u>

Comments: _____

Pump #2:	Motor #2:
Year Installed: <u>Same As Above</u>	Year Installed: <u>Same As Above</u>
Manufacturer:	Manufacturer:
Model and No.:	Model and No.:
Type:	Type:
NOM efficiency:	Horsepower:
Design capacity/TDH:	Efficiency:
Pump RPM:	Inverter duty:
Valve size and type:	Variable/Constant:
Observed flow:	Vertical/Horizontal:
Observed TDH:	Motor RPM:
	Pump curve available:

Comments: Grass needs to be cut by fence line

New station 2012

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: _____

Previous Pump Tests: _____



OTHER PIPING AND VALVES

Air relief valves:	<u>N/A</u>	Excellent	Good	Fair	Poor
Isolation valves:	<u>4" Gate valves</u>	Excellent	Good	Fair	Poor
Piping:		Excellent	Good	Fair	Poor
Comments:	<u>NEW Station 2012</u>				

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: Generac
 Model: SG0035AG034, 2N18HBSYA
 Year Installed: 2011
 Rating: 35 KW
 Fuel Type: Natural GAS

Excellent Good Fair Poor
 Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: _____

Excellent Good Fair Poor

Lighting Level: _____

Excellent Good Fair Poor

Exterior Lighting Type: _____

Excellent Good Fair Poor

Panel Boards: _____

Excellent Good Fair Poor

Motor Control Center: _____

Excellent Good Fair Poor

Disconnect Switches: _____

Excellent Good Fair Poor

Lightning Protection: _____

Excellent Good Fair Poor

Fire Alarm System: N/A

Excellent Good Fair Poor

Security System: N/A

Excellent Good Fair Poor

Potential Code Issues: _____

Comments: _____

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	N/A	Excellent	Good	Fair	Poor
Other:	MISSIOWS	Excellent	Good	Fair	Poor
SCADA:	MAP Multi SMART	Excellent	Good	Fair	Poor
Comments:	_____				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	Natural Gas for generator	Fuel Storage Capacity:	_____
Heating Type:	Small electrical unit	Excellent	Good Fair Poor
Ventilation Type:	_____	Excellent	Good Fair Poor
AC System Type:	N/A	Excellent	Good Fair Poor
Dehumidification:	N/A	Excellent	Good Fair Poor
Louvers:	_____	Excellent	Good Fair Poor
Comments:	_____		

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____



PERFORMANCE CURVE

PRODUCT
CP3127.181

TYPE
HT

DATE
2011-02-11

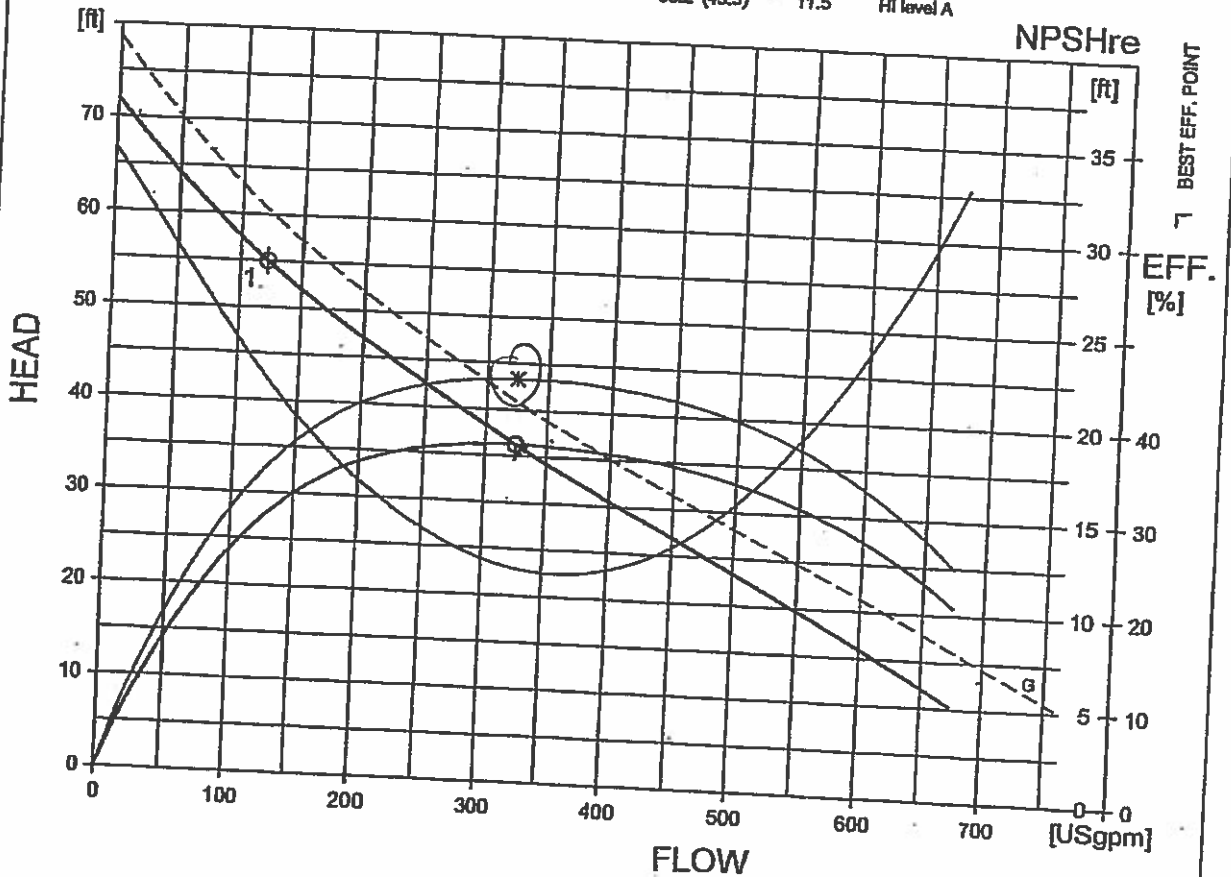
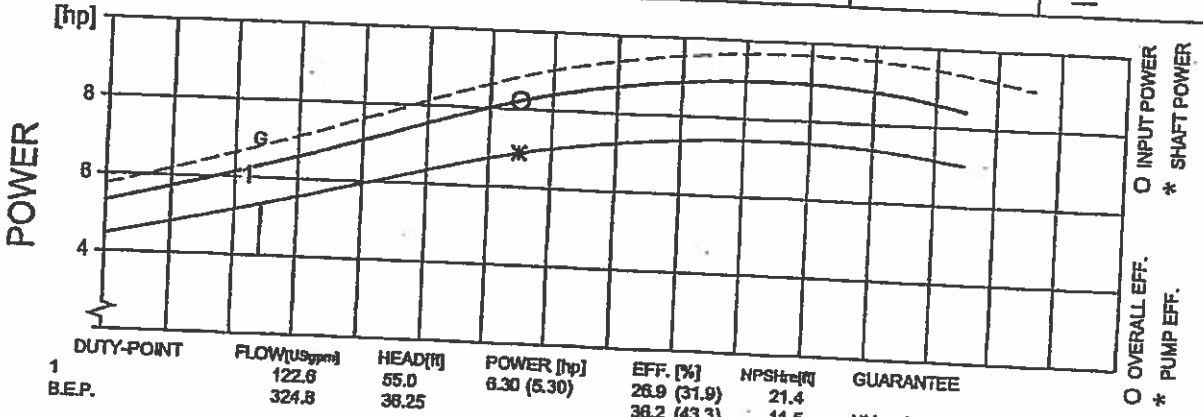
PROJECT
Wareham-Cromesett Rd.

CURVE NO
61-485-00-3002

ISSUE
2

POWER FACTOR	1/1-LOAD	3/4-LOAD	1/2-LOAD	RATED POWER	7.5	hp
EFFICIENCY	0.96	0.99	1.00	STARTING CURRENT	66	A
MOTOR DATA	83.0 %	84.5 %	83.0 %	RATED CURRENT	30	A
COMMENTS	INLET/OUTLET - / 4 inch			RATED SPEED	1745	rpm
	IMP. THROUGHLET 2.9 inch			TOT. MOM. OF INERTIA	0.098	kgm2
				NO. OF BLADES	1	

IMPELLER DIAMETER 200 mm			
MOTOR #	STATOR	REV	
21-12-4AL	12-	13	
FREQ.	PHASES	VOLTAGE	POLES
60 Hz	1	230 V	4
GEARTYPE	RATIO		
-	-		



FLYPS3.1.6.6 (20090913)

NPSH_{req} = NPSH_{3%} + min. operational margin
 Performance with clear water and ambient temp 40 °C

GUARANTEE BETWEEN LIMITS (G) ACC. TO
HI level A

PUMP STATION CONDITION ASSESSMENT

Pump Station:

Depot St
 Depot St
 E. Wareham MA

Inspection Date:

8-13-13
 B. W.

Inspected By:

25 yrs Electrical Panel

Address:

GENERAL INFORMATION

Year Facility Constructed:

1989

Year Facility Modified:

Facility Description:

Concrete Block Structure w/ Asphalt Roof
 Cedar siding, Wetwell, + 3 level Dry Side Pump + Elec

PUMP STATION EQUIPMENT

Number of Pumps:

2

Service Area:

Y

Pump #1:

1989

Motor #1:

1989

Year Installed:

Year Installed:

Manufacturer:

Fairbanks Morse

Manufacturer:

MARATHON EIE

Model and No.:

B5414

Model and No.:

40STTES 739 4AN

Type:

Centrifugal

Type:

TFS

NOM efficiency:

Horsepower:

75

Design capacity/TDH:

Efficiency:

92.4

Pump RPM:

1200

Inverter duty:

Valve size and type:

10" check MHV + F CO

Variable/Constant:

VFD

Observed flow:

Vertical/Horizontal:

Vert

Observed TDH:

Motor RPM:

1200

Pump curve available:

Comments:

Wear Rings + Drive line replaced/rebuilt 2002
 Pump Bearings Replaced 2002 + 2005 due to poor seal installation.
 MOTOR GOOD COND, NO PROBLEMS

Pump #2:

SAME ↑

Motor #2:

SAME ↑

Year Installed:

Year Installed:

Manufacturer:

Manufacturer:

Model and No.:

Model and No.:

Type:

Type:

NOM efficiency:

Horsepower:

Design capacity/TDH:

Efficiency:

Pump RPM:

Inverter duty:

Valve size and type:

Variable/Constant:

Observed flow:

Vertical/Horizontal:

Observed TDH:

Motor RPM:

Pump curve available:

Comments:

Wear rings, Drive line, and Pump Bearings replaced/rebuilt
 2002. Motor GOOD CONDITION

w/ mechanical seals on both pumps - NO WATER is setting
 to bearings. They should LAST longer than the original
 Bearings which LAST \pm 13 years, Pumps could be due
 to bearings, wearings replacement \pm 2017-2018

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

General Station Comments: *ROOF is 23 years old probably due for replacement.*
Paint INSIDE + OUT WALLS, trim, Pipes, Pumps etc.
Paint EXTERIOR ELEC BOX.

emergency lighting
HEATERS

Generator (875,000)

10,000

Previous Pump Tests: _____

electrical panel?
ventilation
80,000
81,000,000

OTHER PIPING AND VALVES

Air relief valves:

N/A

Excellent Good Fair Poor

Isolation valves:

FROZEN UP

Excellent Good Fair Poor

Piping:

SHOULD paint ALL
10" + 12"

Excellent Good Fair Poor

Comments:

ELECTRICAL SYSTEMS INSPECTION

Location Classification:

Dry Location
Wet or Damp Location
Wet Corrosive Location

Comments:

Standby Generator:

Mnfr: Superior
Model: 140 R 461
Year Installed: 1989
Rating:
Fuel Type: N/A

Excellent Good Fair Poor

Facility Load:

Ample capacity(Y/N):

Interior Lighting Type:

Fluorescent

Excellent Good Fair Poor

Lighting Level:

Excellent Good Fair Poor

Exterior Lighting Type:

Sodium Halide

Excellent Good Fair Poor

Panel Boards:

Excellent Good Fair Poor

Motor Control Center:

Excellent Good Fair Poor

Disconnect Switches:

Excellent Good Fair Poor

Lightning Protection:

Excellent Good Fair Poor

Fire Alarm System:

Excellent Good Fair Poor

Security System:

N/A

Excellent Good Fair Poor

Potential Code Issues:

Comments:

Emergency Lighting needs replacing

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Honeywell Truline Excellent Good Fair Poor

Pressure Gauges: _____ Excellent Good Fair Poor

Other: _____ Excellent Good Fair Poor

SCADA: MISSION Excellent Good Fair Poor

Comments: SHOULD Consider JP. Grade to Mercoid Like Colnasset + remove BUBBLER system

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/G Fuel Storage Capacity: UTILITY

Heating Type: Forced Hot AIR N/Gas Excellent Good Fair Poor

Ventilation Type: Fans + Duct work Excellent Good Fair Poor

AC System Type: N/A Excellent Good Fair Poor

Dehumidification: Not working Excellent Good Fair Poor

Louvers: _____ Excellent Good Fair Poor

Comments: (Carbon) Needs to Bid for Repair of Ventilation System
New ~~structure~~ for wetwell vents

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Replace E. Lighting</u>	\$ <u>2000.00</u>
2. <u>Repair Wetwell Ventilation</u>	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. <u>ASPHALT ROOF</u>	\$ <u>4000.00</u>
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Dicks Pond
 Address: CRANBERRY HWY

Inspection Date: 8-13-13
 Inspected By: R Miller

GENERAL INFORMATION

Year Facility Constructed: 1989 Year Facility Modified: _____
 Facility Description: CONCRETE BLOCK ASPHALT ROOF SHingles Cedar Siding

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: Y
 Pump #1: S/N K3T1-059964 Motor #1: _____
 Year Installed: 1989 Year Installed: 1989
 Manufacturer: FAIRBANKS MORSE Manufacturer: MARATHON ELEC
 Model and No.: S 135414 Model and No.: S/N K3T1-059964
 Type: NOM CLOG Centrifugal Type: _____
 NOM efficiency: _____ Horsepower: 40
 Design capacity/TDH: _____ Efficiency: _____
 Pump RPM: _____ Inverter duty: _____
 Valve size and type: 8" CHECK VALVES Variable/Constant: VFD Driven
 Observed flow: _____ Vertical/Horizontal: vert
 Observed TDH: _____ Motor RPM: 1200
 Pump curve available: _____

Comments: VALVES MHV+F CO Ariston A11A Pumps should be painted

Pump #1 rebuilt 2012 impeller wear rings etc.

Pump #2: SAME ↑ Motor #2: SAME ↑
 Year Installed: _____ Year Installed: _____
 Manufacturer: _____ Manufacturer: _____
 Model and No.: _____ Model and No.: _____
 Type: _____ Type: _____
 NOM efficiency: _____ Horsepower: _____
 Design capacity/TDH: _____ Efficiency: _____
 Pump RPM: _____ Inverter duty: _____
 Valve size and type: _____ Variable/Constant: _____
 Observed flow: _____ Vertical/Horizontal: _____
 Observed TDH: _____ Motor RPM: _____
 Pump curve available: _____

Comments: pump #2 rebuilt 7/2003 Bearings, seals, impeller etc.

YAKASAWA VFD's INSTALLED 2009 - Good

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: N/A
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: N/A
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available _____

Comments: _____

General Station Comments: Emergency LTS should be replaced - 3000
ROOF should be replaced, TRIM BOARDS paint + replace
AS NECESSARY
generator 50000 - VFDs -
Roof 5000
Trim wood shingles } 7000 -

Previous Pump Tests: Heads - 3000

80000
100000

OTHER PIPING AND VALVES

Paint All PIPING 8" + 10" VALVES

Air relief valves:	<u>N/A</u>	Excellent	Good	Fair	Poor
Isolation valves:		Excellent	Good	Fair	<u>Poor</u>
Piping:		Excellent	<u>Good</u>	Fair	Poor
Comments:	<u>PAINT ISOLATION VALVES IN WET WELL FROZEN.</u>				

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mnfr: FORD/LEWY SOMER
 Model: LSG 8751 / LSA 42-44
 Year Installed: 1989
 Rating: _____
 Fuel Type: N/A

Excellent	<u>Good</u>	Fair	Poor
Facility Load: _____			
Ample capacity (Y/N): _____			

Interior Lighting Type: Flourescent

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Lighting Level: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: Sodium

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Motor Control Center: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Disconnect Switches: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: Generator AKA SUPERIOR MOD # 75 R461
PAINT IN CONDUIT ELEC BOX - OUTSIDE

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Honeywell

Excellent Good Fair Poor

Pressure Gauges: _____

Excellent Good Fair Poor

Other: _____

Excellent Good Fair Poor

SCADA: N/A Mission

Excellent Good Fair Poor

Comments: _____

5 yr Plan replace Bubble tube system w/ mercury

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/G

Fuel Storage Capacity: UTILITY

Heating Type: Forced Hot Air N/G

Excellent Good Fair < Poor

Ventilation Type: _____

Excellent Good Fair Poor

AC System Type: N/A

Excellent Good Fair Poor

Dehumidification: 2 units N/G

Excellent Good Fair < Poor

Louvers: _____

Excellent Good Fair Poor

Comments: new carbon for net well

MORE WORK to be done by mechanical CONTRACTOR

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

- Item/Recommendation
- 1. Replace E. Lightings
- 2. Repair W.W. VENT
- 3. _____
- 4. _____
- 5. _____

Estimated Capital Project Cost

\$ 2000.00

\$
\$
\$
\$
\$

TOTAL \$

CATEGORY B ITEMS (Implement within 5 years)

- Item/Recommendation
- 1. Replace Asphalt Roof
- 2. _____
- 3. _____
- 4. _____
- 5. _____

Estimated Capital Project Cost

\$ 4000.00

\$
\$
\$
\$
\$

TOTAL \$

CATEGORY C ITEMS (Implement between 6 and 10 years)

- Item/Recommendation
- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station:

EAST BLVD
EAST BLVD
DNSET, MA

Inspection Date:

8-13-17

Inspected By:

B. Miller

GENERAL INFORMATION

Year Facility Constructed:

1971

Year Facility Modified:

Facility Description:

Concrete Bunker w/ water tight door
STEEL TUBE/VESSEL

PUMP STATION EQUIPMENT

Number of Pumps:

2

Service Area:

Y

Pump #1:

Year Installed:

1971

Motor #1:

Year Installed:

1971

Manufacturer:

FOMANS SHONE

Manufacturer:

BALDOR

Model and No.:

Series 4000 +4925

Model and No.:

GA+™ M330-9T

Type:

Duplex ejector 100gpm

Type:

Elec

NOM efficiency:

150 galpm

Horsepower:

5

Design capacity/TDH:

30 TDH

Efficiency:

Pump RPM:

Inverter duty:

Valve size and type:

5" 2 Flapper + 2 V VALVES

Variable/Constant:

CONSTANT

Observed flow:

FAIRBANKS VALVES

Vertical/Horizontal:

HOR

Observed TDH:

Motor RPM:

1140

Pump curve available:

Comments:

Performance Data 0-5psi 36sec, 0-10psi 86sec

0-15 psi 148 sec Avg, 0-20 psi 226 sec Avg. When new 6-26-72

Pump #2:

Year Installed:

SAME ↑

Motor #2:

Year Installed:

SAME ↑

Manufacturer:

Manufacturer:

Model and No.:

Model and No.:

Type:

Type:

NOM efficiency:

Horsepower:

Design capacity/TDH:

Efficiency:

Pump RPM:

Inverter duty:

Valve size and type:

Variable/Constant:

Observed flow:

Vertical/Horizontal:

Observed TDH:

Motor RPM:

Pump curve available:

Comments:

All PIPING + Kettles should be painted,
EXPNION should be painted.

0-5psi 36.5 sec Avg, 0-10psi 85 sec Avg, 0-15psi 149.5 sec Avg, 0-20psi 231

6/26/72

SEC
Avg

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: N/A
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: N/A
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: N/A
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: N/A
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: Pumps have had most wear items replaced several times over the years.

General Station Comments: AIR STATION POWERED BY 2 Quincy Compressors
#1 240-102 installed ~~in~~ 1972
Both compressors SHOULD BE REBUILT
#2 240-102 installed 1972

Previous Pump Tests: _____

OTHER PIPING AND VALVES

(4) 5" Fairbanks Gate Valves

Air relief valves: _____
 Isolation valves: _____
 Piping: _____
 Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor

INSTALLATION ONLY
 (4) 5" GATE VALVES
 2 5" FLAPPER VALVES
 2 5" CHECK VALVES

CHECK VALVES HAVE BEEN REBUILT AS NEEDED THROUGH THE YEARS

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: _____
 Model: _____
 Year Installed: _____
 Rating: _____
 Fuel Type: _____

Excellent Good Fair Poor
 Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: INCANDESCENT

Excellent Good Fair Poor

Lighting Level: UPPER + LOWER

Excellent Good Fair Poor

Exterior Lighting Type: N/A

Excellent Good Fair Poor

Panel Boards: _____

Excellent Good Fair Poor

Motor Control Center: _____

Excellent Good Fair Poor

Disconnect Switches: _____

Excellent Good Fair Poor

Lightning Protection: _____

Excellent Good Fair Poor

Fire Alarm System: N/A

Excellent Good Fair Poor

Security System: N/A

Excellent Good Fair Poor

Potential Code Issues: _____

Comments: P/S HAS AN INDUSTRIAL AIR COMPRESSOR, LEROI BRAND, FOR USE WHEN UTILITY POWER HAS FAILED. THIS COMPRESSOR IS SHARED W/ S. PLVD AND IS QUITE OLD. IT WORKS FINE BUT MAY CONSIDER REPLACING IN 5 YEARS +/-

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: N/A

Pressure Gauges: Mercury Switches
Schedule to replace

Other: _____

SCADA: N/A - MISSION

Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A

Heating Type: 2 Elec unit heaters N/G
compressors Heat Pkgs

Ventilation Type: Elec Fan + Duct work
Failed/tripped @ ± 10 minutes

AC System Type: N/A

Dehumidification: (1) portable N/G

Louvers: 1 Louver NOT working

Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	<u>Poor</u>
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation

- Rebuild Both Compressors
- _____
- _____
- _____
- _____

Estimated Capital Project Cost

\$ 2500.00

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation

- _____
- _____
- _____
- _____
- _____

TOTAL \$ _____

Estimated Capital Project Cost

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation

- _____
- _____
- _____
- _____
- _____

TOTAL \$ _____

50000

Roof - 5000 - 7000 -

Louvers - 1000 -

Heating - 2000 -

exterior door - 1000 -

electrical - 10000 -

All Paint - 7000 -

Pipes & valves - 30000 -

Portable compressor -

Air & All stations -

(AIR)

PUMP STATION CONDITION ASSESSMENT

Pump Station: French ST
 Address: _____

Inspection Date: 8-24-13
 Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 2006 Year Facility Modified: _____
 Facility Description: Outside Pump Station

PUMP STATION EQUIPMENT

Number of Pumps: 2
 Pump #1: _____
 Year Installed: 2006
 Manufacturer: FLYGT
 Model and No.: 3102.090
 Type: MT
 NOM efficiency: _____
 Design capacity/TDH: 25.09 TDH @ 398.4 GPM
 Pump RPM: 1755
 Valve size and type: 4" Check valve
 Observed flow: _____
 Observed TDH: _____

Service Area: Outside
 Motor #1: _____
 Year Installed: 2006
 Manufacturer: FLYGT
 Model and No.: 3102.090
 Type: MT
 Horsepower: 3.9
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: Constant
 Vertical/Horizontal: vertical
 Motor RPM: 1755
 Pump curve available: See Attached

Comments: _____

Pump #2: _____
 Year Installed: 2012
 Manufacturer: FLYGT
 Model and No.: 3102.181
 Type: MT
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: 1755
 Valve size and type: 4" Check
 Observed flow: _____
 Observed TDH: _____

Motor #2: _____
 Year Installed: 2012
 Manufacturer: FLYGT
 Model and No.: 3102.181
 Type: MT
 Horsepower: 3.9
 Efficiency: 82%
 Inverter duty: _____
 Variable/Constant: Constant
 Vertical/Horizontal: vertical
 Motor RPM: 1755
 Pump curve available: see Attached

Comments: P2 has cutter on volute

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: *spread woodchips to give it more of a natural look*

Previous Pump Tests: _____

*PAINT 500
Add cutter to P1 2000*

OTHER PIPING AND VALVES

Air relief valves:

should be checked

Excellent

Good

Fair

Poor

Isolation valves:

Excellent

Good

Fair

Poor

iping:

Excellent

Good

Fair

Poor

Comments:

ELECTRICAL SYSTEMS INSPECTION

Location Classification:

- Dry Location
- Wet or Damp Location
- Wet Corrosive Location

Comments:

Portable generator

Standby Generator:

Mnfr: Portable

Model: _____

Year Installed: _____

Rating: _____

Fuel Type: _____

Excellent

Good

Fair

Poor

Facility Load:

Ample capacity (Y/N):

Interior Lighting Type:

Excellent

Good

Fair

Poor

Lighting Level:

Excellent

Good

Fair

Poor

Exterior Lighting Type:

Excellent

Good

Fair

Poor

Panel Boards:

Excellent

Good

Fair

Poor

Motor Control Center:

Excellent

Good

Fair

Poor

Disconnect Switches:

Excellent

Good

Fair

Poor

Lightning Protection:

Excellent

Good

Fair

Poor

Fire Alarm System:

N/A

Excellent

Good

Fair

Poor

Security System:

N/A

Excellent

Good

Fair

Poor

Potential Code Issues:

Comments:

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
ther:	<u>Mission 2</u>	Excellent	<u>Good</u>	Fair	Poor
SCADA:	_____	Excellent	<u>Good</u>	Fair	Poor
Comments:	_____				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	_____	Fuel Storage Capacity: _____			
Heating Type:	<u>small electrical unit in cabinet</u>	Excellent	<u>Good</u>	Fair	Poor
Ventilation Type:	_____	Excellent	<u>Good</u>	Fair	Poor
AC System Type:	<u>N/A</u>	Excellent	Good	Fair	Poor
Dehumidification:	<u>N/A</u>	Excellent	Good	Fair	Poor
Louvers:	_____	Excellent	<u>Good</u>	Fair	Poor
Comments:	_____				

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Paint cabinet</u>	\$
2. <u>wood chip Area</u>	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PRODUCT

French Pump 1

Serial No. 3102.090		Performance curve No. 61- 434-00-3003		Motor module/type 130	Voltage (V) 230
0620080				Imp.diam/Blade angle 173	Water temp °C 16.0
Base module 003	Impeller No. 438 96 01	Gear type	Gear ratio		

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
47.99	0.0	1.75	233	8.7	0.00
44.93	32.7	1.83	233	9.0	15.10
42.05	77.3	2.03	233	9.7	30.18
39.64	123.2	2.27	233	10.7	40.60
35.58	201.0	2.70	233	12.5	49.99
32.33	265.0	2.99	233	13.8	54.10
28.92	327.0	3.23	233	14.9	55.21
24.84	401.9	3.44	232	15.8	54.68

Accepted after	Test facility	Test date	Time	Chief tester	2293
HI	Lindas LC3 Sweden	06-03-01	13:33		

ORDERNR 162066 POS 3

PLOTTED TEST RESULTS

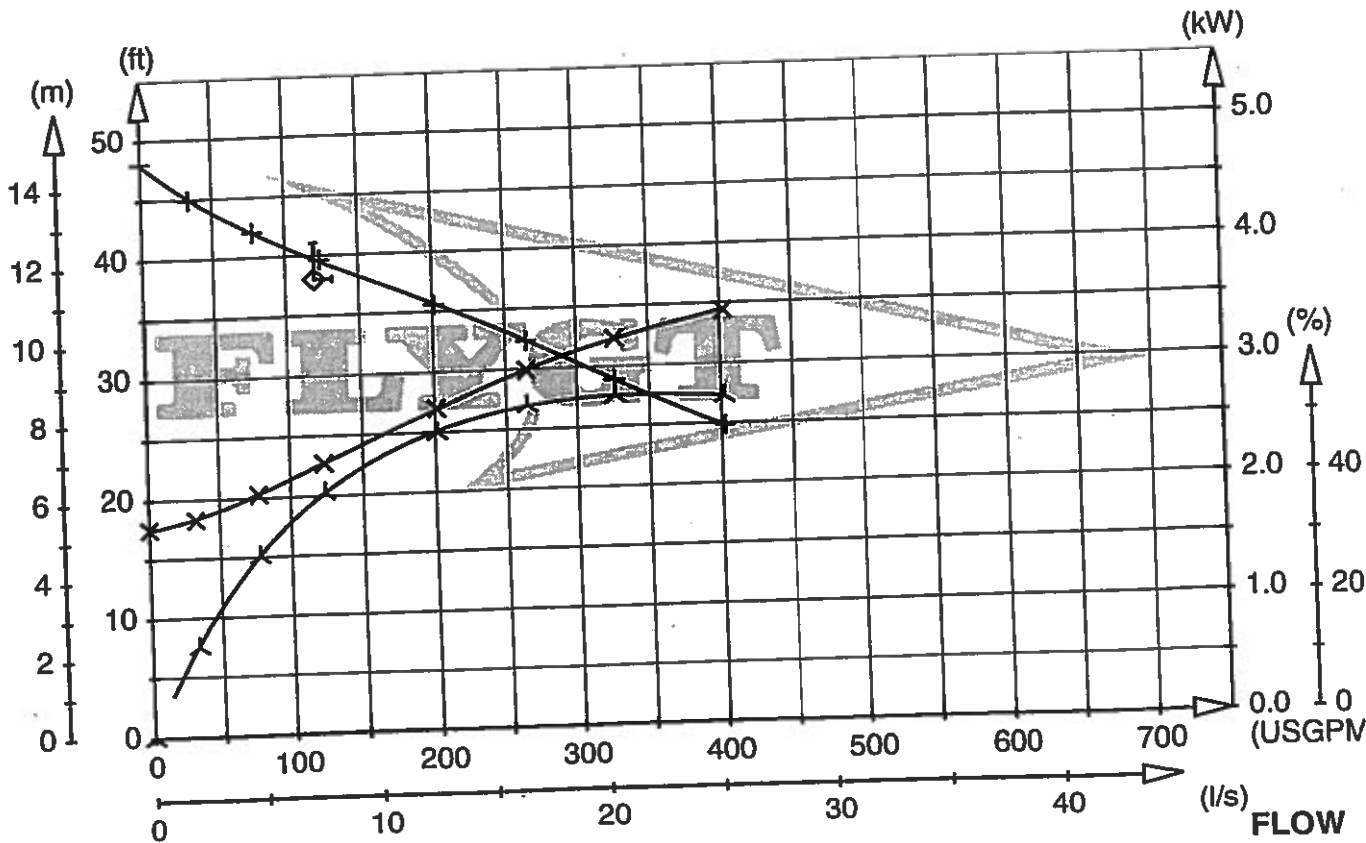
Measured point : + = Q/H
X = Q/P

Duty point : \diamond = Q/H
 \square = Q/P
 \triangle = Q/ETA overall

Calculated point : λ = Q/ETA overall
6

TOTAL HEAD

INPUT POWER



TEST REPORT

PRODUCT

French Pump 1

Serial No. 3102.090		0620079		Performance curve No. 61-434-00-3003		Motor module/type 130	Voltage (V) 230
Base module 003	Impeller No. 438 96 01			Gear type	Gear ratio	Imp.diam/Blade angle 173	Water temp °C 16.0

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
48.03	0.0	1.82	233	8.9	0.00
45.12	32.9	1.95	232	9.4	14.32
41.96	77.6	2.14	233	10.1	28.71
39.52	123.5	2.37	232	11.1	38.80
35.40	201.1	2.77	232	12.8	48.41
31.90	271.6	3.09	232	14.2	52.80
28.49	336.0	3.33	232	15.3	54.20
25.09	398.4	3.54	232	16.3	53.29

FLYGT

Accepted after HI	Test facility Lindas Sweden	Test date LC3 06-03-01	Time 13:21	Chief tester 5306
----------------------	--------------------------------	---------------------------	---------------	----------------------

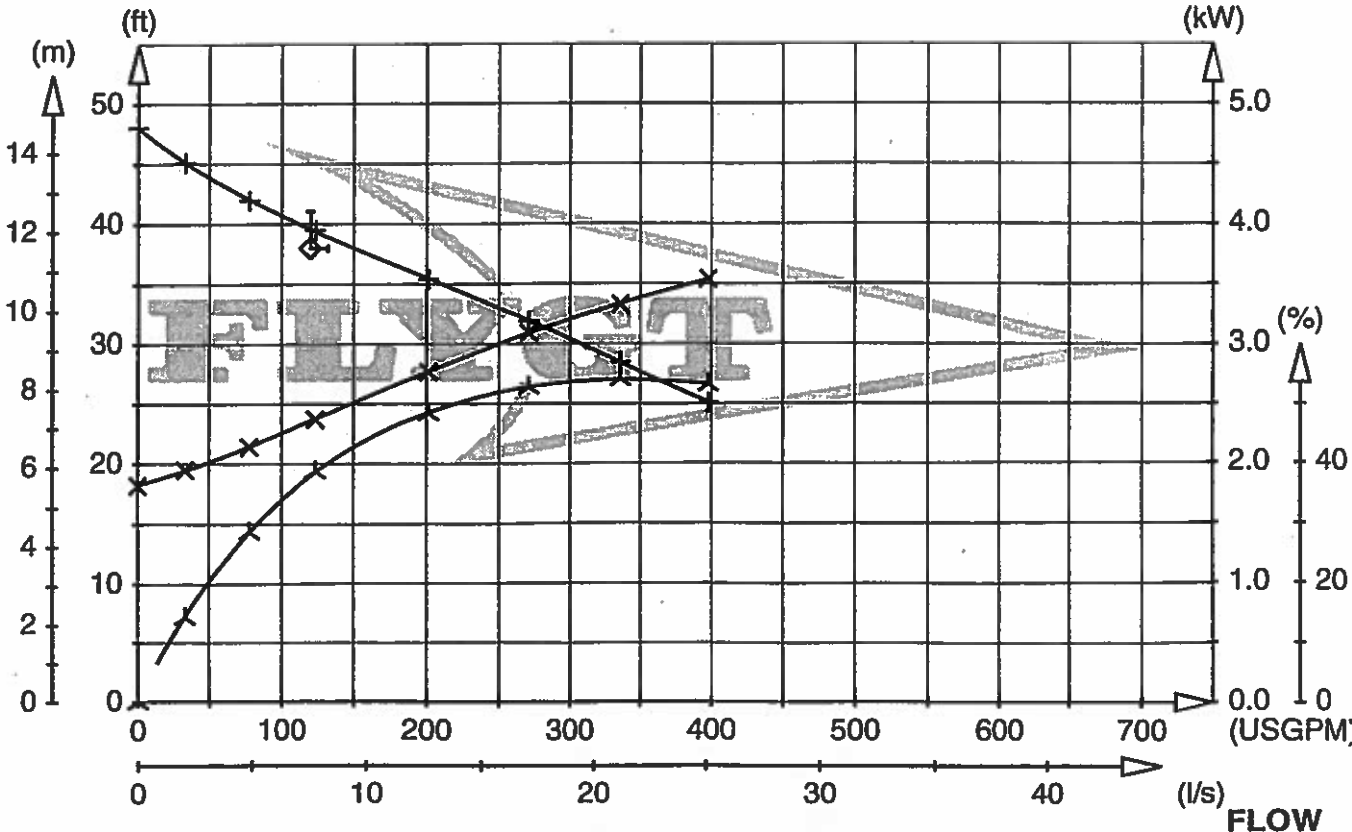
ORDERNR 162066 POS 3

PLOTTED TEST RESULTS


Measured point : \pm = Q/H
 \times = Q/P
 Duty point : \diamond = Q/H
 \square = Q/P
 \triangle = Q/ETA overall
 Calculated point : \blacktriangle = Q/ETA overall
 6

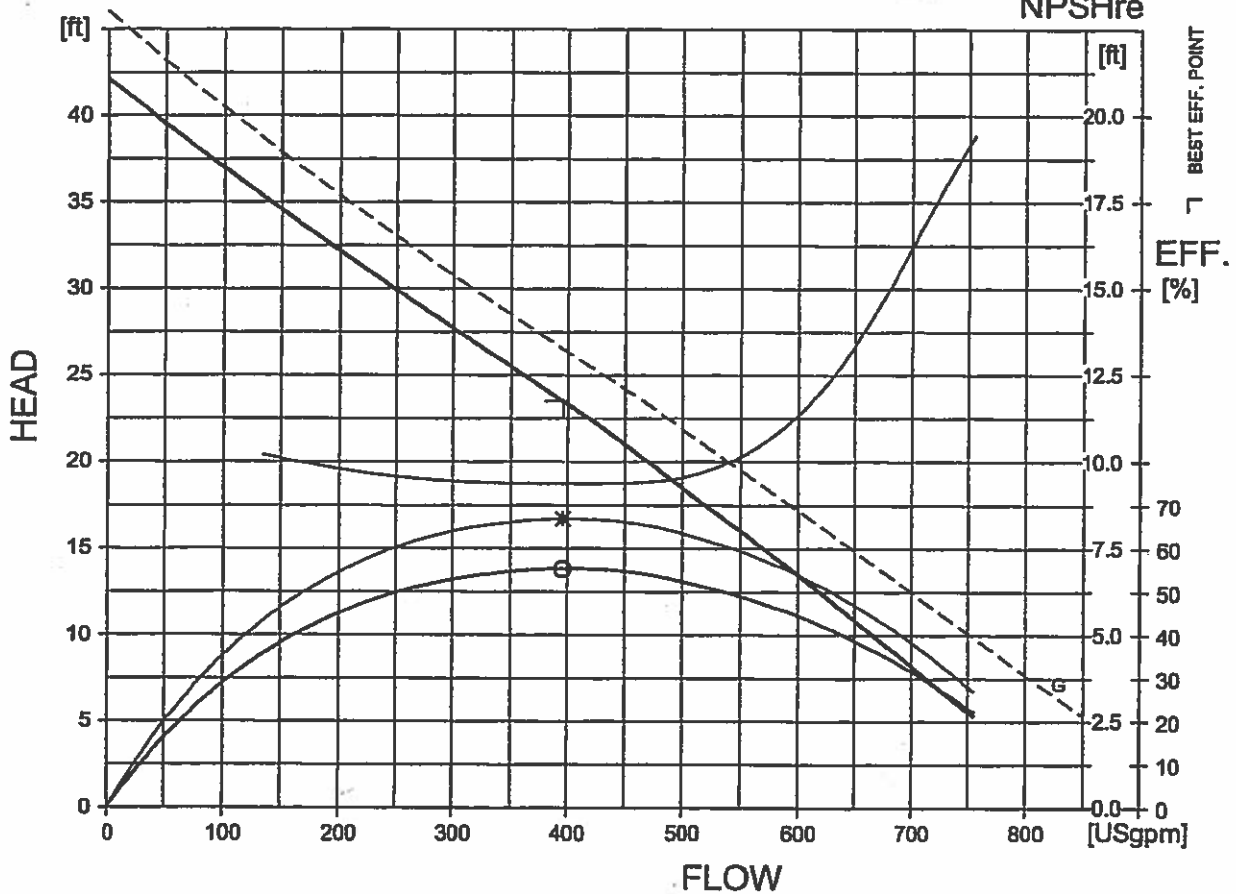
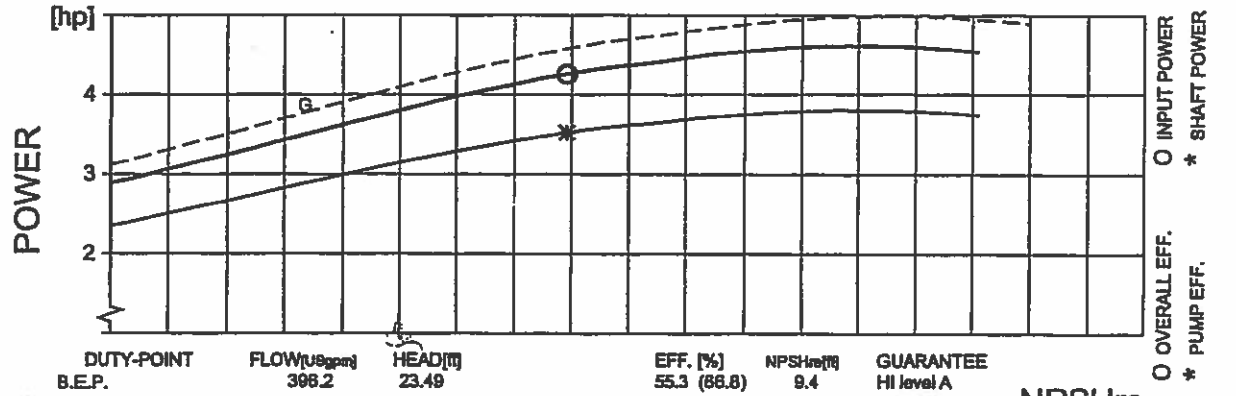
TOTAL HEAD

INPUT POWER



TO BE INSTALLED 8-2012
French

	PERFORMANCE CURVE	PRODUCT NP3102.181	TYPE MT
DATE 2012-05-16	PROJECT	CURVE NO 61-464-00-3003	ISSUE 4
POWER FACTOR 0.94	1/1-LOAD 0.94	3/4-LOAD 0.95	1/2-LOAD 0.95
EFFICIENCY 82.0 %			
MOTOR DATA			
COMMENTS	INLET/OUTLET - 4 inch	RATED POWER 3.9 hp	IMPELLER DIAMETER 162 mm
	IMP. THROUGHLET -	STARTING CURRENT ... 45 A	MOTOR # 18-11-4AL
		RATED CURRENT ... 16 A	STATOR 01-
		RATED SPEED 1755 rpm	REV 12
		TOT. MOM. OF INERTIA ... 0.027 kgm2	FREQ. 60 Hz
		NO. OF BLADES 2	PHASES 1
			VOLTAGE 230 V
			POLES 4
			GEARTYPE -
			RATIO -



FLYPS3.1.6.6 (20090313)

NPSH_{req} = NPSH_{3%} + min. operational margin
 Performance with clear water and ambient temp 40 °C

GUARANTEE BETWEEN LIMITS (G) ACC. TO
HI level A

PUMP STATION CONDITION ASSESSMENT

Pump Station:

Green St

Inspection Date:

8-16-13

Inspected By:

B. [Signature]

Address:

Green St

ONSSET, MA

GENERAL INFORMATION

Year Facility Constructed:

1989

Year Facility Modified:

Block

Facility Description:

Concrete w/ METAL CAN w/ CONCRETE STRUCTURE ON TOP w/ Asphalt
 roof shingles + Cedar Siding

PUMP STATION EQUIPMENT

Number of Pumps:

2

Service Area:

NO

Pump #1:

1989

Motor #1:

Year Installed:

Year Installed:

Manufacturer:

YEOMANS CHICAGO

Manufacturer:

Model and No.:

50-578

Model and No.:

Type:

PERMATIC

Type:

NOM efficiency:

Horsepower:

Design capacity/TDH:

50 gpm / 49' TDH

Efficiency:

Pump RPM:

Inverter duty:

Valve size and type:

4" Fairbanks Flapper + Check

Variable/Constant:

Observed flow:

Vertical/Horizontal:

Observed TDH:

Motor RPM:

Pump curve available:

Comments:

Pumps in good condition AS needed. Wear items have been replaced

Pump #2:

SAME ↑

Motor #2:

Year Installed:

Year Installed:

Manufacturer:

Manufacturer:

Model and No.:

Model and No.:

Type:

Type:

NOM efficiency:

Horsepower:

Design capacity/TDH:

Efficiency:

Pump RPM:

Inverter duty:

Valve size and type:

Variable/Constant:

Observed flow:

Vertical/Horizontal:

Observed TDH:

Motor RPM:

Pump curve available:

Comments:

AIR Supplied from NAVUMETTE, Limited ERCC
 Components in P/S

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available _____

Comments: _____

General Station Comments: EXTERIOR should be painted + Roof Shingles replaced.
 w.w. Piping should be painted and caulked where pipes come thru walls

Previous Pump Tests: _____

Trim wood Shingles - ~~5000~~ 2000 -
 Roof - ~~5000~~ 2000 -
 \$ 4000 - ~~10000~~

OTHER PIPING AND VALVES

Air Piping GOOD

(4) 4" Fairbanks Gate Valves

Air relief valves: _____
 Isolation valves: Interior Only
 Piping: _____
 Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: _____
 Model: N/A
 Year Installed: _____
 Rating: _____
 Fuel Type: _____

Excellent Good Fair Poor

Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: _____

Excellent Good Fair Poor

Lighting Level: _____

Excellent Good Fair Poor

Exterior Lighting Type: _____

Excellent Good Fair Poor

Panel Boards: N/A

Excellent Good Fair Poor

Motor Control Center: N/A

Excellent Good Fair Poor

Disconnect Switches: _____

Excellent Good Fair Poor

Lightning Protection: N/A

Excellent Good Fair Poor

Fire Alarm System: N/A

Excellent Good Fair Poor

Security System: N/A

Excellent Good Fair Poor

Potential Code Issues: _____

Comments: _____

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: N/A

Pressure Gauges: _____

Other: _____

SCADA: MISSION ALARMS

Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A

Heating Type: ELEC WALL HEATERS

Ventilation Type: DUCT + FAN MOTOR

AC System Type: N/A

Dehumidification: _____

Louvers: _____

Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Replace Roof + Siding</u>	\$ <u>6000</u>
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Hill St Jefferson Shores Inspection Date: 8-28-13
 Address: Hill St Inspected By: BA
E. WAREHAM

GENERAL INFORMATION
 Year Facility Constructed: C 1990 Year Facility Modified: _____
 Facility Description: Concrete Block w/ Asphalt Roof Shingles
Cedar Siding Dry Elec Room w/ Generator, w/ Hermet Seal

PUMP STATION EQUIPMENT
 Number of Pumps: 2 Service Area: NO
 Pump #1: _____ Motor #1: _____
 Year Installed: 2013 Year Installed: _____
 Manufacturer: Flyst Manufacturer: _____
 Model and No.: _____ Model and No.: _____
 Type: Sub Type: _____
 NOM efficiency: _____ Horsepower: _____
 Design capacity/TDH: _____ Efficiency: _____
 Pump RPM: _____ Inverter duty: _____
 Valve size and type: _____ Variable/Constant: _____
 Observed flow: _____ Vertical/Horizontal: _____
 Observed TDH: _____ Motor RPM: _____
 Pump curve available: _____
 Comments: impeller code 216

Pump #2: _____ Motor #2: _____
 Year Installed: 2010 Year Installed: _____
 Manufacturer: Flyst Manufacturer: _____
 Model and No.: MP 310T HT S/N 302.170105000 Model and No.: _____
 Type: Submersible Type: _____
 NOM efficiency: _____ Horsepower: 5.4 hp
 Design capacity/TDH: _____ Efficiency: _____
 Pump RPM: 3600 Inverter duty: _____
 Valve size and type: _____ Variable/Constant: CONSTANT
 Observed flow: _____ Vertical/Horizontal: Vert
 Observed TDH: _____ Motor RPM: _____
 Pump curve available: _____

Comments: Both pumps installed w/ Capacitor kits Both in good mech.
condition, STATION is in a LOW FLOW AREA

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

General Station Comments: Exterior Bems Reconditioned (Cosmetically) by neighborhood group - not completed but looking good

CONSIDER ROOF Replacement < 5 years

Roof replacement - 5000
w/ventilation window - 2000
7500

Previous Pump Tests: Amp draws 2-13 P1 8.7, 14.3, 15.8 - P2 15.0, 19.1, 15.0

P2 Amp Draws @ INSTALLATION START UP | 2, 19.7, + 7.7

OTHER PIPING AND VALVES

Air relief valves:

N/A

Excellent Good Fair Poor

Isolation valves:

COULD NOT MOVE 8-28-13

Excellent Good Fair Poor

Piping:

4"

Excellent Good Fair Poor

Comments: Pull M/H cover check ✓ valves

LUBE + EXERCISE 4" Check VALVES + ISOLATION VALVES IN MANHOLE

ELECTRICAL SYSTEMS INSPECTION

Location Classification:

- Dry Location
- Wet or Damp Location
- Wet Corrosive Location

Comments:

Standby Generator:

Mnfr: SUPERIOR
 Model: 30R123
 Year Installed: 1990
 Rating: 30 kw
 Fuel Type: Diesel

Excellent Good Fair Poor

Facility Load:

Ample capacity (Y/N): Y

Interior Lighting Type:

Flourescent

Excellent Good Fair Poor

Lighting Level:

Excellent Good Fair Poor

Exterior Lighting Type:

Wetwell Halogen

Excellent Good Fair Poor

Panel Boards:

Excellent Good Fair Poor

Motor Control Center:

Excellent Good Fair Poor

Disconnect Switches:

Excellent Good Fair Poor

Lightning Protection:

Excellent Good Fair Poor

Fire Alarm System:

N/A

Excellent Good Fair Poor

Security System:

N/A

Excellent Good Fair Poor

Potential Code Issues:

Comments: Wetwell VENTILATION NOT WORKING

Wetwell FIEC JUNCTION BOX should be serviced + Painted

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Hour meters Excellent Good Fair Poor

Pressure Gauges: _____ Excellent Good Fair Poor

Other: _____ Excellent Good Fair Poor

CADA: MISSION COMM Excellent Good Fair Poor

Comments: Simple 240V single phase 9/5

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A Fuel Storage Capacity: _____

Heating Type: HARSING Elec Excellent Good Fair Poor

Ventilation Type: WALL FAN + Excellent Good Fair Poor

AC System Type: N/A Excellent Good Fair Poor

Dehumidification: N/A Excellent Good Fair Poor

Louvers: _____ Excellent Good Fair Poor

Comments: _____

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Wetwell Ventilation</u>	\$ <u>2000</u>
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Roof Replacement</u>	\$ <u>3000</u>
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station:

Hynes Field

Inspection Date:

8-14-13

Inspected By:

RML

Address:

ONSET AVE
ONSET, MA

GENERAL INFORMATION

Year Facility Constructed:

1971

Year Facility Modified:

2004

Facility Description:

Brick + Concrete Flat Roof P/S
wet well + 2 level dry side

PUMP STATION EQUIPMENT

Number of Pumps:

2

Service Area:

Y

Pump #1:

2004

Motor #1:

2004

Year Installed:

Year Installed:

Manufacturer:

Cornwell

Manufacturer:

Reliance Elec.

Model and No.:

8NHTA-VC 18DB

Model and No.:

L002EG

Type:

Centrifugal

Type:

Elec

NOM efficiency:

Horsepower:

60

Design capacity/TDH:

Efficiency:

94.5

Pump RPM:

Inverter duty:

Valve size and type:

check 12" Clow Kennedy

Variable/Constant:

ABB VFD

Observed flow:

Vertical/Horizontal:

vert

Observed TDH:

Motor RPM:

1185

Pump curve available:

Comments:

Both Pumps + motors in very good condition

~~Blue VFD #1~~ ~~HASA 12" led LCD screen~~

Paint Pumps

Pump #2:

SAME ↑

Motor #2:

SAME ↑

Year Installed:

Year Installed:

Manufacturer:

Manufacturer:

Model and No.:

Model and No.:

Type:

Type:

NOM efficiency:

Horsepower:

Design capacity/TDH:

Efficiency:

Pump RPM:

Inverter duty:

Valve size and type:

Variable/Constant:

Observed flow:

Vertical/Horizontal:

Observed TDH:

Motor RPM:

Pump curve available:

Comments:

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: N/A
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

General Station Comments: NEW FLAT ROOF INSTALLED 2
NO WATER to Bathroom Sink

Previous Pump Tests: _____

Ventilation - 5000 -
Paint ALL - 5060 -
2nd. moywo muncher - 12000 -

OTHER PIPING AND VALVES

(3) 14" MHV + F CO Knife VALVES 1977
(1) 10" " " " 1977
(2) 12" CLOW Kennedy gate VALVES 2004

(1) 4" MHV + F CO gate 1972

Air relief valves:	_____	Excellent	Good	Fair	Poor
Isolation valves:	(2) #1 North Not working #2 South OK	Excellent	Good	Fair	Poor
Piping:	_____	Excellent	Good	Fair	Poor
Comments:	Should Exercise Both INFLUENT ISOLATION VALVES Paint Piping				

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: CATERPILLAR
 Model: D125-G
 Year Installed: 2008
 Rating: 125KV
 Fuel Type: Diesel

Excellent	Good	Fair	Poor
Facility Load: _____			
Ample capacity (Y/N): _____			

Interior Lighting Type: Fluorescent

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: Incandescent

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: Wetwell 1+5 Good

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Hour meters
 Pressure Gauges: _____
 Other: _____
 SCADA: MISSION

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Comments: Press switches of this kind @ other STATIONS have had reliability issues BUT NOT @ Hynes

MECHANICAL SYSTEMS INSPECTION N/A
 Fuel Source: _____

Fuel Storage Capacity: _____

Heating Type: EIEC wall heaters

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Ventilation Type: LOUVRES + EXHAUST FANS
↳ DUCTWORK

Excellent	Good	Fair	<u>Poor</u>
-----------	------	------	-------------

AC System Type: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Dehumidification: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Louvers: _____

Excellent	Good	<u>Fair</u>	Poor
-----------	------	-------------	------

Comments: Wetwell VENTILATION MOTOR/FAN NOISY

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

- Item/Recommendation
- repair wetwell ventilation
 - _____
 - _____
 - _____
 - _____

Estimated Capital Project Cost

\$	<u>5000</u>
\$	
\$	
\$	
\$	
\$	
\$	
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

- Item/Recommendation
- _____
 - _____
 - _____
 - _____
 - _____

Estimated Capital Project Cost

\$	
\$	
\$	
\$	
\$	
\$	
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

- Item/Recommendation
- _____
 - _____
 - _____
 - _____
 - _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Indian Neck
 Address: _____

Inspection Date: 8-17-13
 Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 2010 Year Facility Modified: _____
 Facility Description: outside pump station with weather tight control panel

PUMP STATION EQUIPMENT

Number of Pumps: <u>2</u>	Service Area: <u>outside</u>
Pump #1:	Motor #1:
Year Installed: <u>2010</u>	Year Installed: <u>2010</u>
Manufacturer: <u>ABS</u>	Manufacturer: <u>ABS</u>
Model and No.: <u>AFPK 1547.263</u>	Model and No.: <u>AFPK 1547.263</u>
Type: <u>Enclosed Submersible</u>	Type: <u>Enclosed Submersible</u>
NOM efficiency: _____	Horsepower: <u>28</u>
Design capacity/TDH: <u>90</u>	Efficiency: <u>89.7 @ 100%</u>
Pump RPM: <u>1750</u>	Inverter duty: _____
Valve size and type: <u>1 1/2" check valve</u>	Variable/Constant: <u>Continuous duty</u>
Observed flow: _____	Vertical/Horizontal: <u>Vertical - Submersible</u>
Observed TDH: <u>NO - manual says 90 TDH</u>	Motor RPM: <u>1750</u>
Comments: <u>Motors have Thermal Protection and seal Failure Early Warning System</u>	Pump curve available: <u>yes - Attached</u>

Pump #2:	Motor #2:
Year Installed: <u>Same As Above</u>	Year Installed: <u>Same As Above</u>
Manufacturer: _____	Manufacturer: _____
Model and No.: _____	Model and No.: _____
Type: _____	Type: _____
NOM efficiency: _____	Horsepower: _____
Design capacity/TDH: _____	Efficiency: _____
Pump RPM: _____	Inverter duty: _____
Valve size and type: _____	Variable/Constant: _____
Observed flow: _____	Vertical/Horizontal: _____
Observed TDH: _____	Motor RPM: _____
Comments: _____	Pump curve available: _____

Clear Beck Fence Line

Pump #3:
Year Installed: N/A
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: N/A
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available _____

Comments: _____

General Station Comments: Newer Pump station (2010)

Paint cabinet 500-

Previous Pump Tests: _____

OTHER PIPING AND VALVES

Air relief valves:	_____	Excellent	Good	Fair	Poor
Isolation valves:	8" Gate valves	Excellent	Good	Fair	Poor
Piping:	New - 2010	Excellent	Good	Fair	Poor
Comments:	_____				

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: Weather tight Cabinet

Standby Generator: Mfr: Generac
 Model: 11573540100
 Year Installed: 2010
 Rating: _____
 Fuel Type: Natural GAS

Excellent	Good	Fair	Poor
Facility Load: _____			
Ample capacity (Y/N): _____			

Interior Lighting Type: Weather tight Fixture

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: No outside lighting

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: NONE

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: New - 2010

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: new 2010

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: NONE

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: NONE

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: _____

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: multi smart

Pressure Gauges: _____

Other: missions

SCADA: _____

Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: None

Heating Type: Electric Heater inside
Weather tight

Ventilation Type: Small Fan inside
Weather tight

AC System Type: None

Dehumidification: None

Louvers: Open infiltration louvers that
do not close

Comments: _____

Fuel Storage Capacity: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

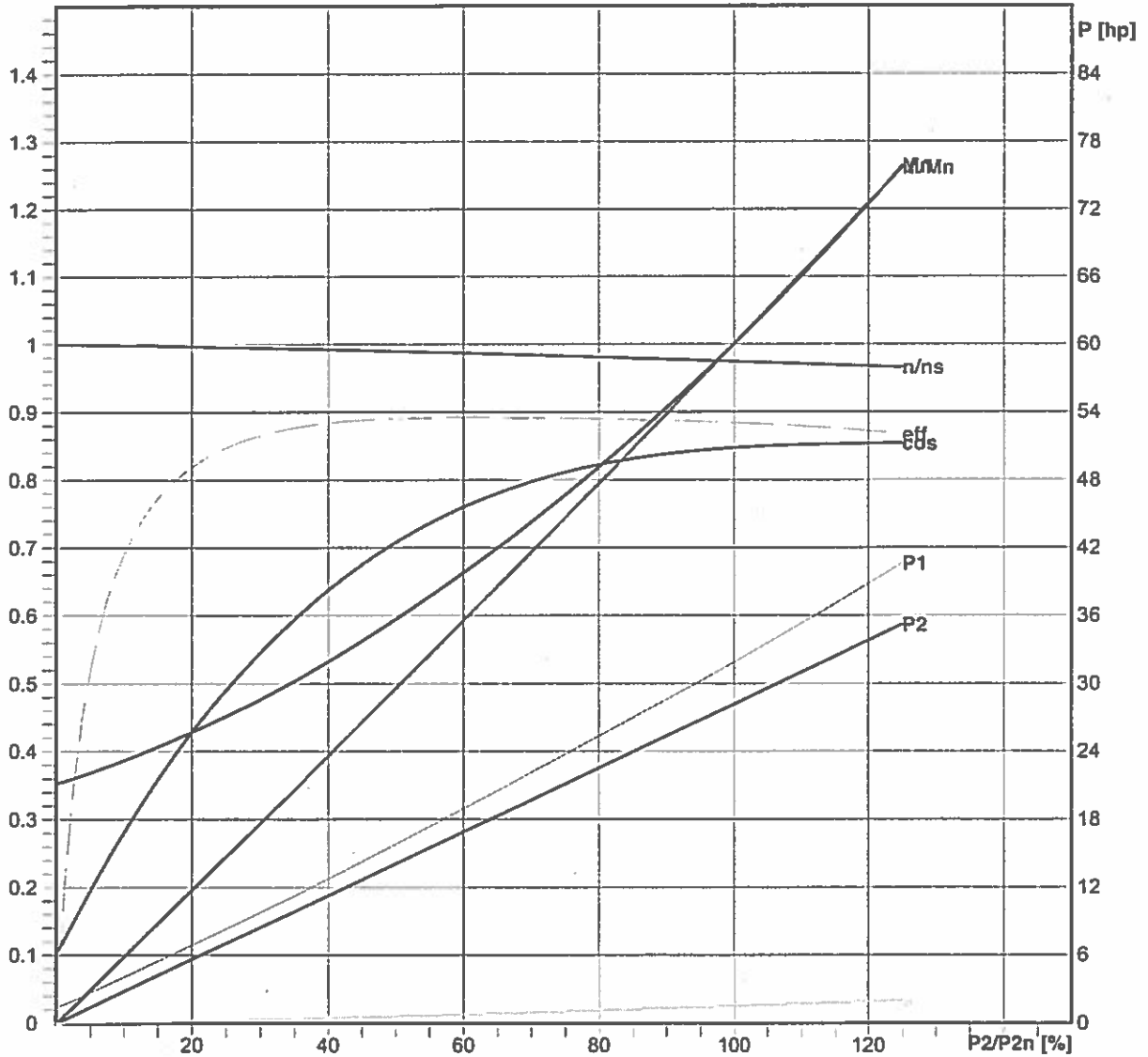


Motor performance curve ME210/4D 60HZ

Frequency
60 Hz

590GPM @ 90°TDH

Rated power 28.2 hp	Service factor	Nominal speed 1755 rpm	Number of poles 4	Rated voltage 460 V	Date 2009-05-08
------------------------	----------------	---------------------------	----------------------	------------------------	--------------------



Loading	No load	25 %	50 %	75 %	100 %	125 %
P1 [hp]	1.337	8.312	15.82	23.73	31.88	40.61
P2 [hp]	0	7.04	14.08	21.12	28.16	35.2
I [A]	12.4	15.89	20.92	27.38	35.21	44.5
eff [%]	0	84.7	88.99	89.01	88.34	86.69
cos	0.1009	0.4896	0.7077	0.8113	0.8474	0.8541
n [rpm]	1800	1792	1781	1768	1754	1738
M [lbf ft]	0	20.63	41.53	62.74	84.33	106.4
s [%]	0.0004409	0.4422	1.06	1.773	2.558	3.444

Tolerance according to VDE 0530 T1 12.84 for rated power

Starting current 195 A	Starting torque 235 lbf ft	Moment of inertia 2.5 lb ft ²
---------------------------	-------------------------------	---

PUMP STATION CONDITION ASSESSMENT

Pump Station: Kendrick Pump Station Inspection Date: 9-1-13
 Address: _____ Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: _____ Year Facility Modified: 2003
 Facility Description: _____

PUMP STATION EQUIPMENT

Number of Pumps: <u>2</u>	Service Area: _____
Pump #1:	Motor #1: _____
Year Installed: <u>2003</u>	Year Installed: <u>2003</u>
Manufacturer: <u>FLYGT</u>	Manufacturer: <u>FLYGT</u>
Model and No.: <u>3085</u>	Model and No.: <u>3085</u>
Type: <u>MT</u>	Type: <u>MT</u>
NOM efficiency: _____	Horsepower: <u>3HP</u>
Design capacity/TDH: <u>22</u>	Efficiency: <u>77%</u>
Pump RPM: <u>1690</u>	Inverter duty: _____
Valve size and type: <u>4" check</u>	Variable/Constant: <u>Constant</u>
Observed flow: _____	Vertical/Horizontal: <u>Vertical</u>
Observed TDH: _____	Motor RPM: <u>1690</u>
	Pump curve available: <u>See attached.</u>

Comments: _____

Pump #2:	Motor #2:
Year Installed: <u>Same As Above</u>	Year Installed: <u>Same As Above</u>
Manufacturer: _____	Manufacturer: _____
Model and No.: _____	Model and No.: _____
Type: _____	Type: _____
NOM efficiency: _____	Horsepower: _____
Design capacity/TDH: _____	Efficiency: _____
Pump RPM: _____	Inverter duty: _____
Valve size and type: _____	Variable/Constant: _____
Observed flow: _____	Vertical/Horizontal: _____
Observed TDH: _____	Motor RPM: _____
	Pump curve available: _____

Comments: _____

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available _____

Comments: _____

General Station Comments: *station needs new trim, paint, possibly new roof
 fence line needs minor trimming of trees
 Transfer switch is outside - should consider moving to inside the building*

Previous Pump Tests:

~~10/02~~

*Possible upgrade
 trailer park!*

OTHER PIPING AND VALVES

Air relief valves:	_____	Excellent	Good	Fair	Poor
Isolation valves:	_____	Excellent	Good	Fair	Poor
Piping:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: Generac
 Model: 98A-02710-S
 Year Installed: _____
 Rating: KW 20
 Fuel Type: Natural GAS

Excellent Good Fair Poor

Facility Load:
 Ample capacity (Y/N): _____

Interior Lighting Type: _____

Excellent Good Fair Poor

Lighting Level: _____

Excellent Good Fair Poor

Exterior Lighting Type: N/A

Excellent Good Fair Poor

Panel Boards: _____

Excellent Good Fair Poor

Motor Control Center: _____

Excellent Good Fair Poor

Disconnect Switches: outside of building

Excellent Good Fair Poor

Lightning Protection: _____

Excellent Good Fair Poor

Fire Alarm System: N/A

Excellent Good Fair Poor

Security System: N/A

Excellent Good Fair Poor

Potential Code Issues: _____

Comments: _____

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	<u>MISSIONS</u>	Excellent	<u>Good</u>	Fair	Poor
SCADA:	_____	Excellent	<u>Good</u>	Fair	Poor
Comments:	_____				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	_____	Fuel Storage Capacity: _____			
Heating Type:	_____	Excellent	<u>Good</u>	Fair	Poor
Ventilation Type:	_____	Excellent	<u>Good</u>	Fair	Poor
AC System Type:	<u>N/A</u>	Excellent	Good	Fair	Poor
Dehumidification:	<u>N/A</u>	Excellent	Good	Fair	Poor
Louvers:	_____	Excellent	<u>Good</u>	Fair	Poor
Comments:	_____				

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$ _____
2. _____	\$ _____
3. _____	\$ _____
4. _____	\$ _____
5. _____	\$ _____
TOTAL \$ _____	

CATEGORY B ITEMS (Implement within 5 years)

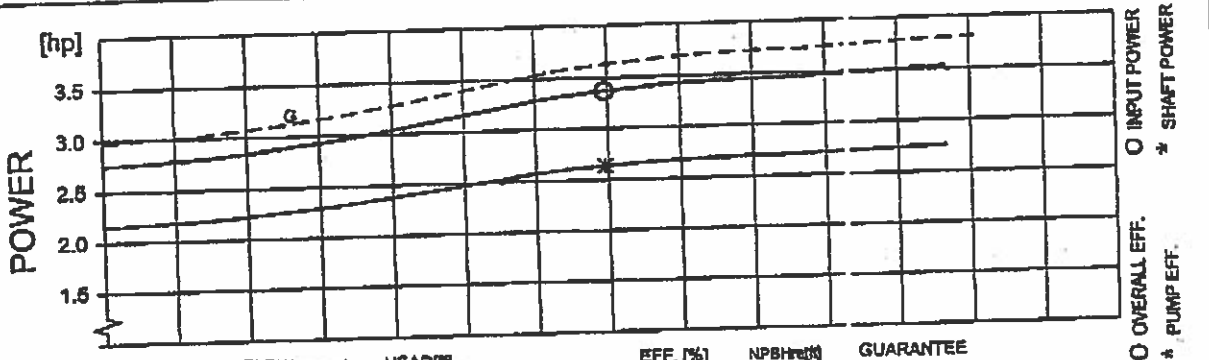
Item/Recommendation	Estimated Capital Project Cost
1. _____	\$ _____
2. _____	\$ _____
3. _____	\$ _____
4. _____	\$ _____
5. _____	\$ _____
TOTAL \$ _____	

CATEGORY C ITEMS (Implement between 6 and 10 years)

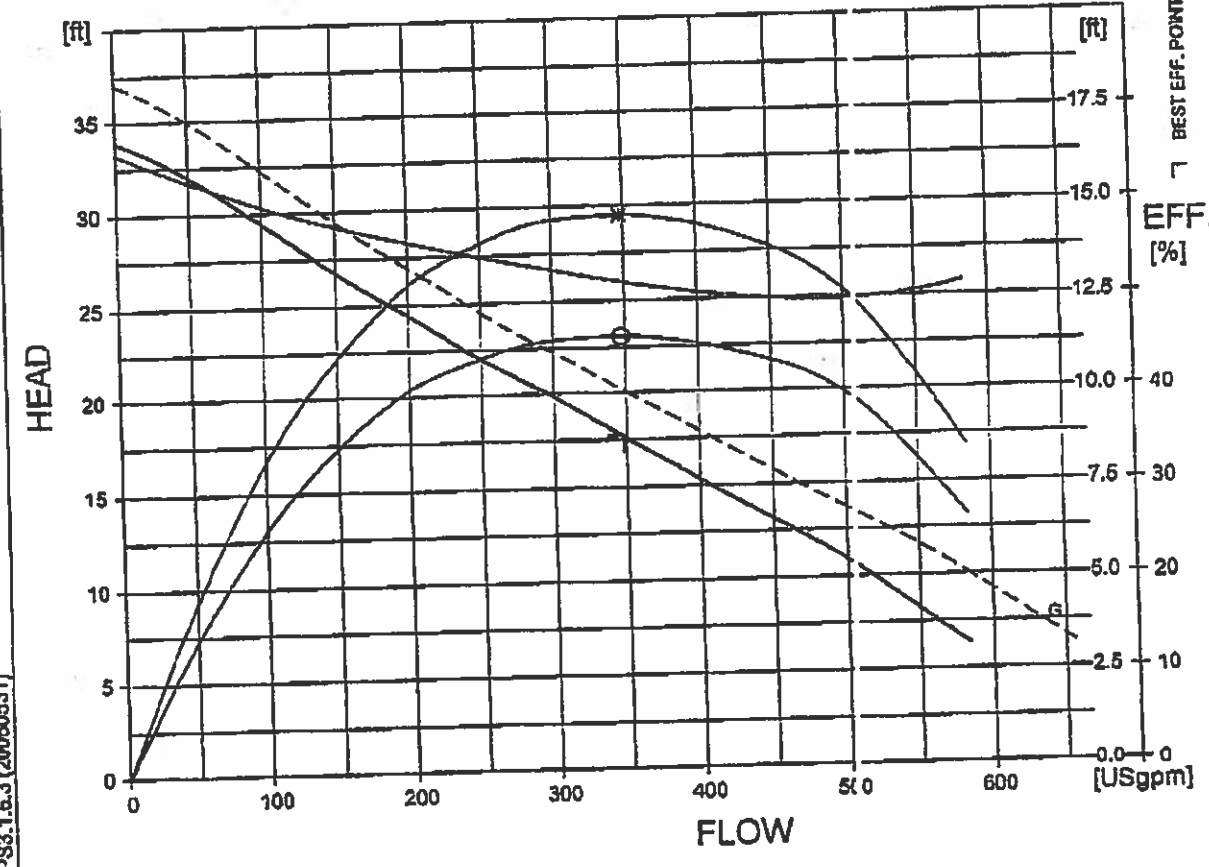
Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

Attn: Brian Miller

FLYGT		PERFORMANCE CURVE				PRODUCT NP3085.183	TYPE MT
DATE 2009-05-20	PROJECT KENDRICK RD / INDUSTRIAL PARK				CURVE NO (13-462-00-5306)	ISSUE 5	
POWER FACTOR EFFICIENCY MOTOR DATA COMMENTS	1/1-LOAD	3/4-LOAD	1/2-LOAD	RATED POWER	3	PELLER DIAMETER 151 mm	
	0.85	0.80	0.70	STARTING CURRENT ...	50	MOTOR # 15-10-4AL	STATOR REV 88Y 10
	77.0 %	79.0 %	78.0 %	RATED CURRENT ...	9.9	FREQ. 60 Hz	PHASES 3
	INLET/OUTLET - / 3.0 inch			RATED SPEED	1690	VOLTAGE 200 V	POLES 4
	IMP. THROUGHLET ---			TOT. MOM. OF INERTIA ...	0.018	GEARTYPE ---	
				NO. OF BLADES	2	RATIO ---	



DUTY-POINT B.E.P. FLOW [USgpm] 348 HEAD [m] 17.7 EFF. [%] 46.2 (59.0) NPSHreq [ft] 13.3 GUARANTEE HI level A



22' Head

FLYPS3.1&3 (20090531)

NPSH_{req} = NPSH_{3%} + min. operational margin
 Performance with clear water and ambient temp 40°C

GUARANTEE BETWEEN LIMITS (G) ACC. TO
HI level A

MAY 20 2009

WWPCF

PUMP STATION CONDITION ASSESSMENT

Pump Station: Kennedy Ln
Address: Kennedy Ln
Wareham MA

Inspection Date: 8-14-13
Inspected By: RML

GENERAL INFORMATION

Year Facility Constructed: _____ Year Facility Modified: 2004
Facility Description: Brick + Concrete w/ Flat Roof P/S
Well + 2 level pump room + Elec Room

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: yes
Pump #1: _____ Motor #1: _____
Year Installed: 2004 Year Installed: 2004
Manufacturer: Cornwell Manufacturer: Reliance Elec
Model and No.: SUNT-VC1808 Model and No.: L002 EG
Type: Centrifugal Type: ELECTRIC
NOM efficiency: _____ Horsepower: 40
Design capacity/TDH: _____ Efficiency: 90%
Pump RPM: _____ Inverter duty: _____
Valve size and type: 10" Clow Kennedy Check Variable/Constant: VFD By ABB
Observed flow: _____ Vertical/Horizontal: Vert
Observed TDH: _____ Motor RPM: 1180
Pump curve available: _____
Comments: LOW HOURS, GOOD CONDITION For Both pumps + Motors

Pump #2: SAME ↑ Motor #2: SAME ↑
Year Installed: _____ Year Installed: _____
Manufacturer: _____ Manufacturer: _____
Model and No.: _____ Model and No.: _____
Type: _____ Type: _____
NOM efficiency: _____ Horsepower: _____
Design capacity/TDH: _____ Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: _____ Variable/Constant: _____
Observed flow: _____ Vertical/Horizontal: _____
Observed TDH: _____ Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available _____

Comments: _____

General Station Comments:

Ventilation is MAIN P/S ISSUE

Lights in Pump room to a lesser Degree, Bldg + SWITCH
 fixtures seem OK.

2 muffin monsters in wetwell from JWC both work w/
 NO issues But should have cutters replaced.

Previous Pump Tests:

Ventilation - 5000 -
 Level sensor - 5000 -
 electrical - 10000 -
 Replace cutters - 10000 -
 muffin monsters

30000

OTHER PIPING AND VALVES

(2) 12" MHV+F CO Gate VALVES (Krite) - 1972

(2) 10" Ahma 250 gate VALVES - 2004

Air relief valves: N/A
 Isolation valves: INSTALLED 1972
 Piping: ADD NEW PIPING
 Comments:

Excellent	Good	Fair	Poor
Excellent	Good	Fair	<u>Poor</u>
Excellent	<u>Good</u>	Fair	Poor

ISOLATION VALVES in Wet well PHYSICALLY FROZEN

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: P/S Prone to Lightning STRIKES, MAIN DISCONNECT REPLACED 2011

Standby Generator: Mnfr: CATERPILLAR
 Model: D100-G
 Year Installed: 2008
 Rating: 100KW
 Fuel Type: DIESEL

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Facility Load:
 Ample capacity (Y/N): Y

Interior Lighting Type: Flourescent
+ Sodium Pump Room

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	<u>Poor</u>

Lighting Level:

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Exterior Lighting Type: Incandescent

Excellent	Good	Fair	Poor
Excellent	Good	Fair	<u>Poor</u>

Panel Boards: SOME EQUIP replaced due to Lightning

Excellent	Good	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor

Motor Control Center: Original Equipment

Excellent	Good	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor

Disconnect Switches:

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Lightning Protection: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Security System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Potential Code Issues:

Comments: Wet well Lighting Good (Incandescent)
Wetwell VENTILATION NOT WORKING - Louvers NOT WORKING
Wetwell Switches FAIR

OTHER: Pump ROOM VENTILATION NOT WORKING today

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Hour Meters

Pressure Gauges: Have had reliability issues w/ Level Control Press. Switched

Other: _____

SCADA: MISSION

Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Consider Changing Level Control to Mercaid type and remove air system

MECHANICAL SYSTEMS INSPECTION

Fuel Source: _____

Heating Type: ELEC WALL MOUNT

Ventilation Type: PUMP ROOM FAN + DUCT

AC System Type: N/A

Dehumidification: N/A

Louvers: _____

Comments: _____

Fuel Storage Capacity: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	<u>Poor</u>

Pump room switches, fans, lights need replacing

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Ventilation Syst Rehab</u>	\$ <u>< 5000.00</u>
2. _____	\$ _____
3. _____	\$ _____
4. _____	\$ _____
5. _____	\$ _____
TOTAL	\$ _____

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$ _____
2. _____	\$ _____
3. _____	\$ _____
4. _____	\$ _____
5. _____	\$ _____
TOTAL	\$ _____

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Leeward ST
 Address: _____

Inspection Date: 8-24-13
 Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 2006 Year Facility Modified: _____
 Facility Description: out door Pump station

PUMP STATION EQUIPMENT

Number of Pumps: 2
 Pump #1:
 Year Installed: 2006
 Manufacturer: FLYGT
 Model and No.: 3102.090
 Type: MT
 NOM efficiency:
 Design capacity/TDH: 29.38 @ 32.61 gpm
 Pump RPM: 1755
 Valve size and type: 4" check
 Observed flow:
 Observed TDH:

Service Area: outside
 Motor #1:
 Year Installed: 2012 2006
 Manufacturer: FLYGT
 Model and No.: 3102.090
 Type: MT
 Horsepower: 3.9
 Efficiency: 52.60
 Inverter duty:
 Variable/Constant: CONSTANT
 Vertical/Horizontal: vertical
 Motor RPM: 1755
 Pump curve available: See Attached.

Comments: P2 Has a cutter on volute.

Pump #2:
 Year Installed: 2012
 Manufacturer: FLYGT
 Model and No.: 3102.181
 Type: MT
 NOM efficiency:
 Design capacity/TDH: 25.86 TDH @ 360.9 gpm
 Pump RPM: 1755
 Valve size and type: 4" check
 Observed flow:
 Observed TDH:

Motor #2:
 Year Installed: 2012
 Manufacturer: FLYGT
 Model and No.: 3102.181
 Type: MT
 Horsepower: 3.9
 Efficiency: 82%
 Inverter duty:
 Variable/Constant: CONSTANT
 Vertical/Horizontal: vertical
 Motor RPM: 1755
 Pump curve available: See Attached

Comments: P2 Has A cutter on volute

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: Needs woodchips for natural surrounding at station
Weed whack station

Previous Pump Tests: _____

Add cutter to P1 - 2000
Paint cabinet 500
2500

OTHER PIPING AND VALVES

Air relief valves: None
 Isolation valves: 4" Gate
 Piping: DI
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mnfr: N/A Portable
 Model: _____
 Year Installed: _____
 Rating: _____
 Fuel Type: _____

Excellent	Good	Fair	Poor
Facility Load:			
Ample capacity (Y/N):			

Interior Lighting Type: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Lighting Level: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Exterior Lighting Type: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Panel Boards: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Motor Control Center: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Disconnect Switches: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: _____

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: _____
 Pressure Gauges: _____
 Other: missions
 SCADA: _____
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A
 Heating Type: small unit inside cabinet
 Ventilation Type: _____
 AC System Type: N/A
 Dehumidification: N/A
 Louvers: _____
 Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Wood chip around Area</u>	\$
2. <u>UPGRADE FI to cutter?</u>	\$
3.	\$
4.	\$
5.	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Repair Cabinet</u>	\$
2.	\$
3.	\$
4.	\$
5.	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1.
2.
3.
4.
5.

PRODUCT

Pump 1 Leonard Str.

Serial No. 3102.090 0620077		Performance curve No. 61- 434-00-3003		Motor module/type 130	Voltage (V) 230
Base module 003	Impeller No. 438 96 01	Gear type	Gear ratio	Imp.diam/Blade angle 173	Water temp °C 16.0

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
48.61	0.0	1.80	232	8.8	0.00
45.56	32.4	1.93	231	9.3	14.41
42.36	76.7	2.10	231	10.0	29.20
39.49	134.8	2.41	231	11.3	41.72
35.97	199.4	2.75	231	12.8	49.20
32.76	263.7	3.08	231	14.2	53.00
29.38	326.3	3.32	231	15.3	54.53
24.04	419.5	3.62	231	16.8	52.60

FLYGT

Accepted after HI	Test facility Lindas LC3 Sweden	Test date 06-03-01	Time 13:02	Chief tester 2138
----------------------	---------------------------------------	-----------------------	---------------	----------------------

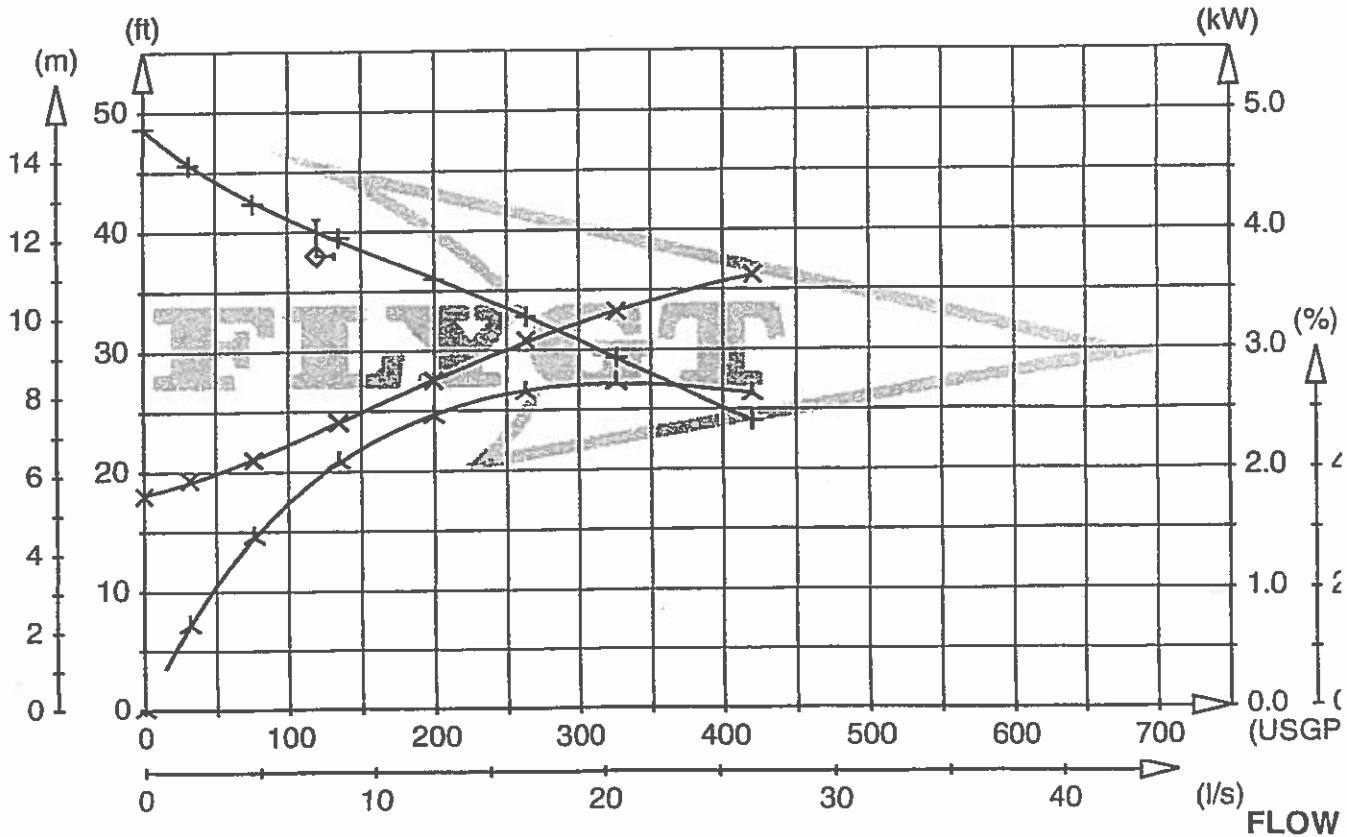
ORDERNR 162066 POS 2

PLOTTED TEST RESULTS

Measured point: + = Q/H
x = Q/P
Duty point: \diamond = Q/H
 \square = Q/P
 \triangle = Q/ETA overall
Calculated point: λ = Q/ETA overall
6

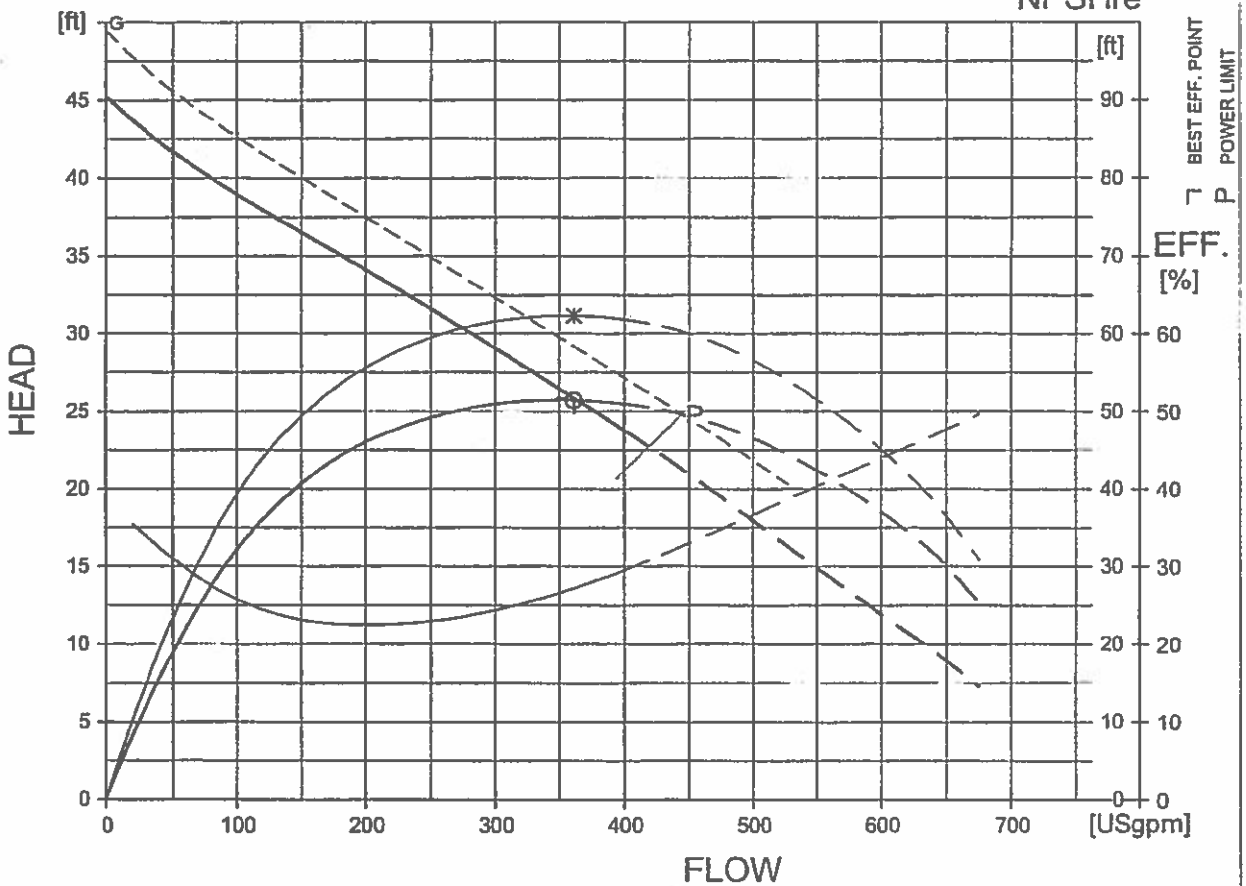
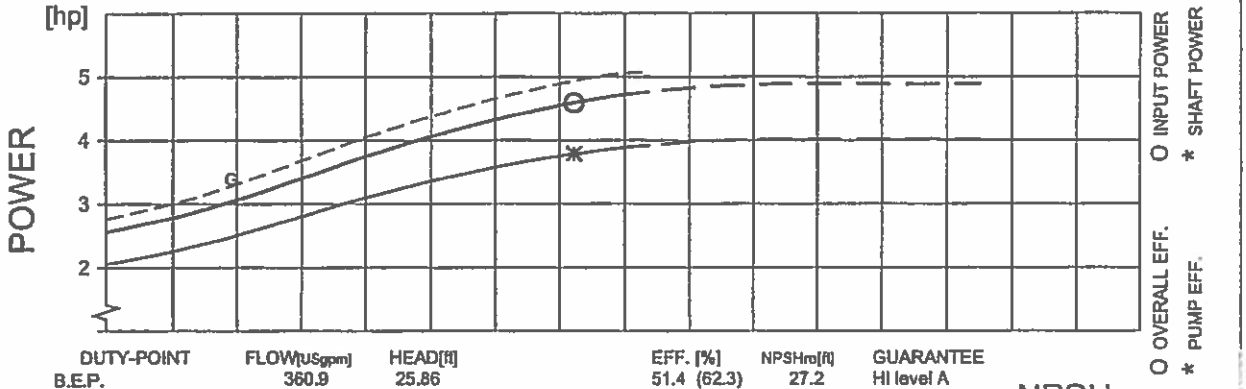
TOTAL HEAD

INPUT POWER



Leonard St.
Pump 2

		PERFORMANCE CURVE			PRODUCT CP3102.181	TYPE MT	
DATE 2012-05-16	PROJECT				CURVE NO 61-434-00-3003	ISSUE 2	
POWER FACTOR 0.94 EFFICIENCY 82.0 % MOTOR DATA —	1/1-LOAD 0.94	3/4-LOAD 0.95	1/2-LOAD 0.95	RATED POWER 3.9 hp	IMPELLER DIAMETER 173 mm		
	—	—	—	STARTING CURRENT ... 45 A	MOTOR # 18-11-4AL	STATOR 01-	REV 12
COMMENTS NEVACLOG	INLET/OUTLET - / 4 inch		RATED CURRENT ... 16 A	RATED SPEED 1755 rpm	FREQ. 60 Hz	PHASES 1	VOLTAGE 230 V
	IMP. THROUGHLET 2.9 inch		TOT. MOM. OF INERTIA ... —	NO. OF BLADES 1	GEARTYPE —		RATIO —



FLYPS3.1.6.6 (20090313)

NPSH_r = NPSH_{3%} + min. operational margin
 Performance with clear water and ambient temp 40 °C

GUARANTEE BETWEEN LIMITS (G) ACC. TO
HI level A

PUMP STATION CONDITION ASSESSMENT

Pump Station: Mattaponisett Road
Address: _____

Inspection Date: 8-20-13
Inspected By: S WARDEN

GENERAL INFORMATION

Year Facility Constructed: 2012 Year Facility Modified: _____
Facility Description: Outside Pump Station

PUMP STATION EQUIPMENT

Number of Pumps: <u>2</u>	Service Area: <u>outside</u>
Pump #1:	Motor #1:
Year Installed: <u>2012</u>	Year Installed: <u>2012</u>
Manufacturer: <u>FLYGT</u>	Manufacturer: <u>FLYGT</u>
Model and No.: <u>CP3085.183</u>	Model and No.: <u>CP3085.183</u>
Type: <u>MT</u>	Type: <u>MT</u>
NOM efficiency:	Horsepower: <u>2.4</u>
Design capacity/TDH: <u>19.70'</u>	Efficiency: <u>80.5%</u>
Pump RPM: <u>1710</u>	Inverter duty:
Valve size and type: <u>4"</u>	Variable/Constant: <u>Constant</u>
Observed flow:	Vertical/Horizontal: <u>Vertical</u>
Observed TDH:	Motor RPM: <u>1710</u>
	Pump curve available: <u>See Attached</u>

Comments: _____

Pump #2:
Year Installed: Same As Above
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #2:
Year Installed: Same As Above
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

New station 2012
Trim Fence Line

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: _____

Previous Pump Tests: _____

OTHER PIPING AND VALVES

Air relief valves:	_____	Excellent	Good	Fair	Poor
Isolation valves:	_____	Excellent	Good	Fair	Poor
Piping:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: Generac
 Model: SG-0035AG034.2N18HBSYA
 Year Installed: 2011
 Rating: 35 kW
 Fuel Type: Natural GAS

_____	Excellent	Good	Fair	Poor
Facility Load:	_____			
Ample capacity (Y/N):	_____			

Interior Lighting Type: _____

_____	Excellent	Good	Fair	Poor
-------	-----------	------	------	------

Lighting Level: _____

_____	Excellent	Good	Fair	Poor
-------	-----------	------	------	------

Exterior Lighting Type: _____

_____	Excellent	Good	Fair	Poor
-------	-----------	------	------	------

Panel Boards: _____

_____	Excellent	Good	Fair	Poor
-------	-----------	------	------	------

Motor Control Center: _____

_____	Excellent	Good	Fair	Poor
-------	-----------	------	------	------

Disconnect Switches: _____

_____	Excellent	Good	Fair	Poor
-------	-----------	------	------	------

Lightning Protection: _____

_____	Excellent	Good	Fair	Poor
-------	-----------	------	------	------

Fire Alarm System: N/A

_____	Excellent	Good	Fair	Poor
-------	-----------	------	------	------

Security System: N/A

_____	Excellent	Good	Fair	Poor
-------	-----------	------	------	------

Potential Code Issues: _____

Comments: _____

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: _____
 Pressure Gauges: N/A
 Other: MISSING
 SCADA: _____
 Comments: _____

<u>Excellent</u>	Good	Fair	Poor
Excellent	Good	Fair	Poor
<u>Excellent</u>	Good	Fair	Poor
<u>Excellent</u>	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: Natural ~~Gas~~ GAS
 Heating Type: Small Electric Heater in cabinet
 Ventilation Type: _____
 AC System Type: N/A
 Dehumidification: N/A
 Louvers: _____
 Comments: _____

Fuel Storage Capacity: _____

<u>Excellent</u>	Good	Fair	Poor
<u>Excellent</u>	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
<u>Excellent</u>	Good	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

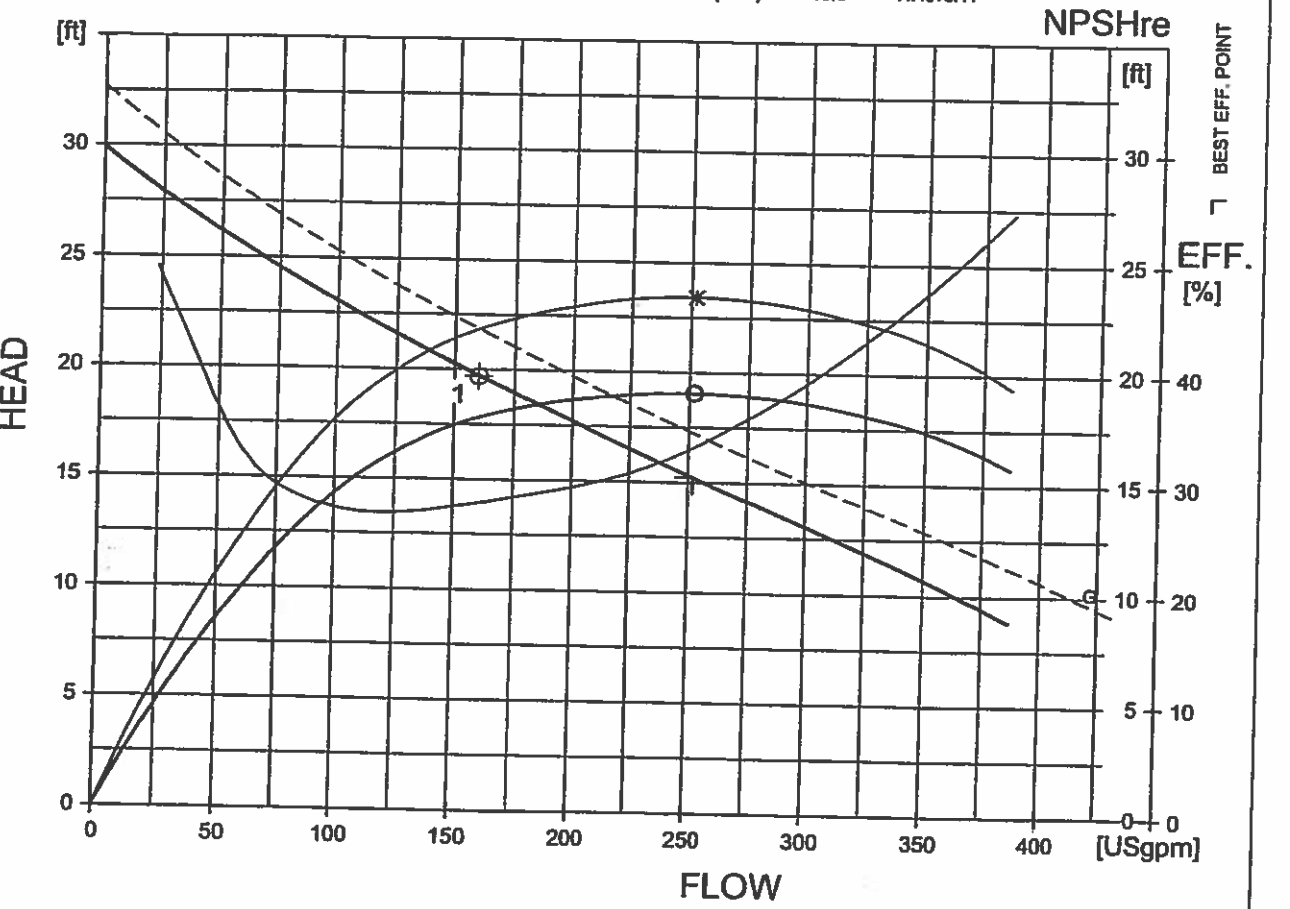
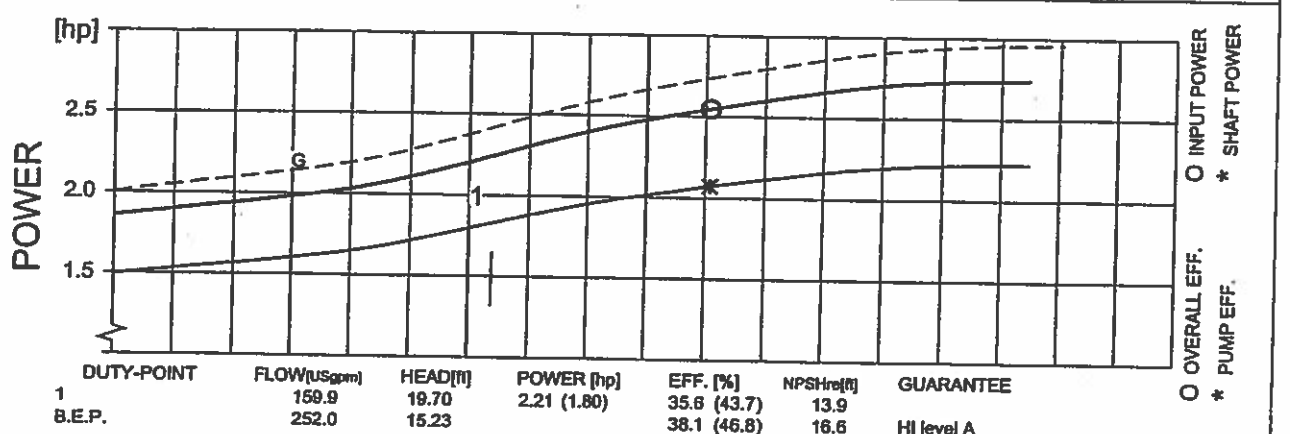
CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

FLYGT		PERFORMANCE CURVE		PRODUCT CP3085.183	TYPE MT	
DATE 2012-03-01	PROJECT Mattapoisett - Wareham, MA			CURVE NO 61-436-00-4503	ISSUE 4	
POWER FACTOR 0.94	1/1-LOAD 0.96	3/4-LOAD 0.95	1/2-LOAD 0.95	RATED POWER 2.4 hp	IMPELLER DIAMETER 146 mm	
EFFICIENCY 80.5 %				STARTING CURRENT ... 47 A	MOTOR # 15-10-4AL	
MOTOR DATA ---				RATED CURRENT ... 10 A	STATOR 12-	
COMMENTS	INLET/OUTLET - / 3.0 inch		RATED SPEED 1710 rpm	FREQ. 60 Hz	PHASES 1	REV 11
	IMP. THROUGHLET 2.9 inch		TOT.MOM.OF INERTIA ... 0.030 kgm2	VOLTAGE 230 V	POLES 4	
			NO. OF BLADES 1	GEARTYPE ---	RATIO ---	



FLYPS3.1.6.6 (20090313)

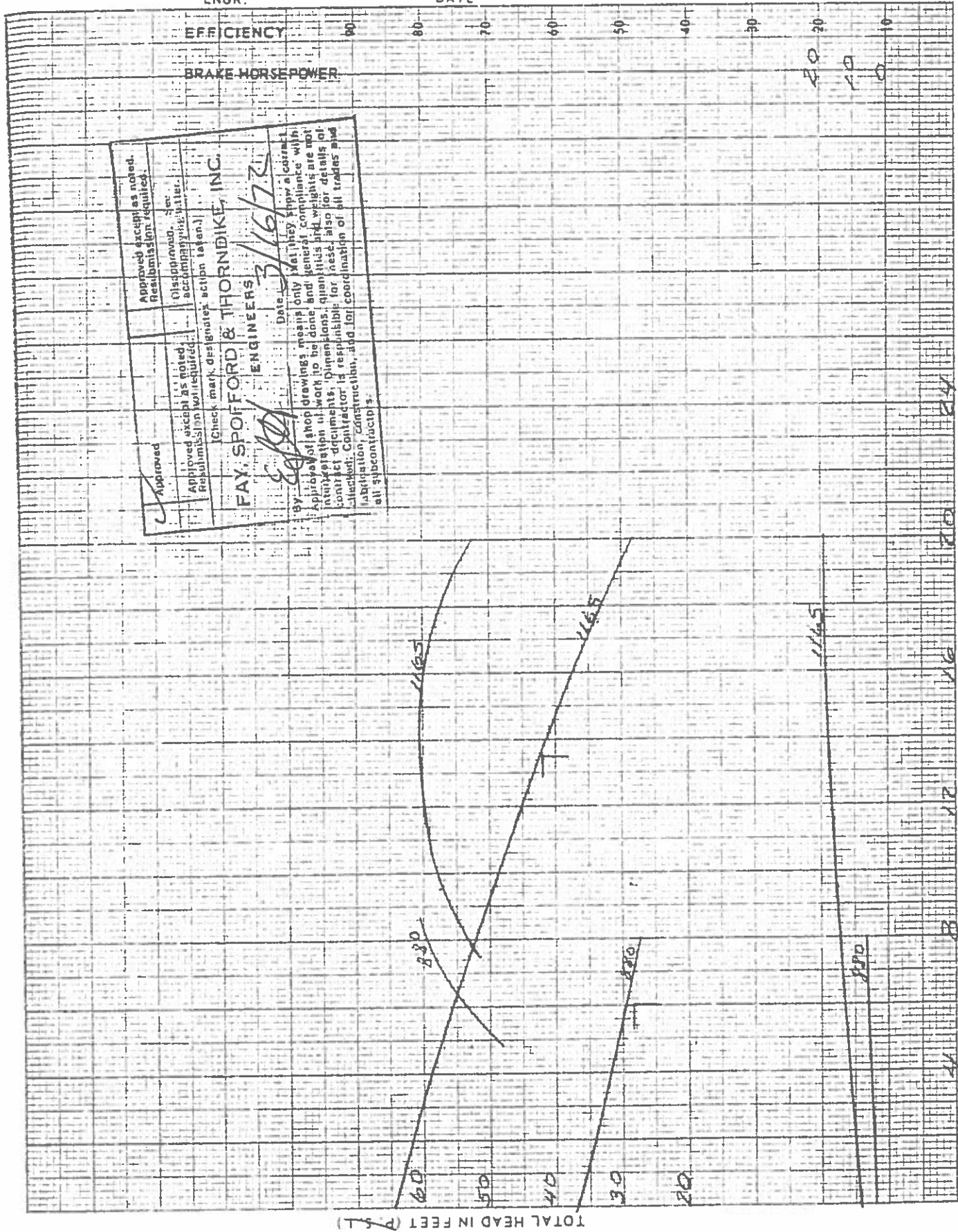
NPSHre = NPSH3% + min. operational margin
 Performance with clear water and ambient temp 40 °C

GUARANTEE BETWEEN LIMITS (G) ACC. TO
HI level A



PUMP NO. K2R-062767 STAGES 1 SIZE-FIGURE 6" 5443R
 TESTED 3-2-72 DRIVER T-MTR 20/11 IMPELLER T6C1CL
 Certified Correct by O. B. Smith 3/72 IMP. DIA. 1 7/8"
 ENGR. DATE R.P.M. 1165-880

CERTIFIED PUMP PERFORMANCE CURVE



Approved Approved except as noted. Resubmission required.
 Disapproved Approved except as noted. Resubmission not required.
 [Check mark designates action taken.]
FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS
 Date: 3/16/72
 By: [Signature]
 I hereby certify that the drawings, specifications, and general compliance with interpretation of work to be done, quantities and weights are not in conflict with the contract documents, specifications, and general details of contract documents. I am responsible for coordination of all trades and fabrication, construction, and for coordination of all trades and all subcontractors.

U. S. GALLONS PER MINUTE X 100





Fairbanks Morse
Pump & Electric Division

Onset Pier #1

IMP TEST LOG

CUSTOMER

Russell Pump & Electric Corp.
Size 6 x 8 CW | -CCP | Fig. 5443R-32 Pump
Branch _____ Order _____
Tested By Richard Wilson Date 9-2-72

OPERATIVE CONDITIONS

1350- 600 G.P.M.
42- 335 Ft. Tot. Hd.
11625- 800 R.P.M.
Motor 20 % Eff. H.P.
Engine 11 (AC-DC)
Serial No. _____

EQUIPMENT

Size of {Piezometer} 775
Venturi-
Disch. Gauge No. HGT H2O 14442
Suction Gauge H4
Misc. Note 111

DATA

Serial No. Pump R2101-062009
Impeller Symbol TG61C1K
Diam. 11 7/8 inches
Material Br
Rating Chart _____

DISCHARGE HEAD "A" ACTUAL GAGE HEAD FEET	SUCTION LIFT FEET	VEL. HEAD FEET "C"	TOTAL HEAD FEET ABC & D	U.S. GALLONS PER MIN.	PRESSURE HEAD ON NOZZLE	SIZE OF NOZZLE	WATER H.P. OUTPUT	% EFF. PUMP	B. H. P. INPUT TO PUMP	SPEED R. P. M.	TORQUE POUNDS	EFF. DRIVER	K. W. INPUT	WATTMETER READING C=	VOLTS	AMPS.	REMARKS
41.9	2.5	5.1	58.5	2000	12.7	5"	72.6	72.6	19.35	1165	48.2						Certified Curve <u>ve</u>
42.5	7.4	3.9	53.8	1750	9.4	"	76.5	76.5	17.55		67.4						Curve Approval <u>ve</u>
48.5	5.7	3.1	59.3	1550	7.0	"	80.1	80.1	17.7		64.3						Test Report
53.7	6.0	2.3	62.0	1350	5.0	"	80.6	80.6	17.75		61.0						<u>10.1 test Test</u>
58.8	5.2	1.7	46.0	1150	3.3	"	79.6	79.6	16.8		57.5						
43.7	4.0	1.2	49.8	950	26.9	"	77.7	77.7	15.35		52.8						
47.8	4.6	0.7	53.1	750	15.9	"	71.5	71.5	14.05		48.3						
61.3	3.8	-	34.6	-	-	"	-	-	9.15		31.5						
52.1	7.6	0.5	77.6	600	10.4	"	79.0	79.0	6.95	200	3.6						
25.1	4.3	0.5	29.9	600	9.3	"	73.4	73.4	6.16	1	28.0						
33.6	3.3	-	26.9	-	-	"	-	-	4.05	1	19.2						

Pump Driven By 3 C H.P. { Dynamometer Sates Motor }
Direct. Conn. { To Pump } Test-Motor-No. A = 4000
Motor Eff. at 1/2 _____, 3/4 _____, 4/4 _____, 5/4 _____ Name Plate Rating _____
Released By _____ Day Log No. _____
Test Log No. 5

Distance Between Gages { Plus _____ Minus _____ Ft. "D" } P.S.I. _____
Pipe Inside Diam. { Suction _____ Inches Discharge _____ Inches }
Max. Pipe Size { Suction _____ Inches Discharge _____ Inches }
Liquid to be Pumped Water Sp. Gr. 1.0



MG1-4.34 Report of Test Form for Induction Motors

CONTINENTAL ELECTRIC CO., Inc.

Newark, N. J.

Rockford, Ill. ONSET PIER # 1

REPORT OF TESTS

INDUCTION MOTOR

Purchaser -
**PURCELL PUMP
Engineering Corp.**

Date of Test 11/24/71

Continental
F. O. No. G3988

Serial No. G39881

Order No. B3947A

W. S. 18438

NAMEPLATE RATING

Hp Output	Syn. Speed Rpm	Full-Load Speed-Rpm	Phase	Cycles	Volts	Amperes Full Load	Type	Frame Number
20/11	1200/900	1165/880	3	60	460	27/17	WV	3640P

TEMPERATURE RISE

Conditions of Test				Temperature Rise—Deg C					
Hours Run	Line Volts	Line Amperes	Cooling Air Deg C	Stator		Rotor		Commutator Bars	Collector Rings
				Core By Thermometer method	Windings (Cross Out One) By Resistance Method By Thermometer Method	Core by Thermometer Method	Windings (Cross Out One) By Resistance Method By Thermometer Method		
4/4	460	27/17	29	40/40	38/37				

CHARACTERISTICS

Slip—Per Cent	Amperes Running Light	Secondary Volts at Standstill	Secondary Amperes per Ring at Full Load	Resistance at 25 C (between lines) Ohms
2.9/2.2	15/10			.458/.946

TORQUE AND STARTING CURRENT

Break-Down Torque Lbs at 1 ft radius	Locked-Rotor Torque Lbs at 1 ft radius with —% volts applied	Starting Current Amperes (locked rotor) with —% volts applied
185/Calc /150	33/30 @ 5190V	73/45 @ 5190V

HIGH-POTENTIAL TESTS

Volts A-c for <u>60</u> Sec.	
Stator	Rotor
2000	

EFFICIENCIES AND POWER FACTOR

Efficiency, Per Cent			Power Factor, Per Cent		
Full Load	½ Load	¼ Load	Full Load	½ Load	¼ Load
88/86	85.5/84	82/80	78.5/70	71/61.5	58.5/49

Notes:

Data from test on this motor.
(this or duplicate)

Approved by Edward Biller
Designing Engineer

Date 11/24/71



PUMP STATION CONDITION ASSESSMENT

Pump Station: ONSET PIER Inspection Date: 8-14-13
Address: ONSET AVE Inspected By: B Miller
ONSET MA

43

GENERAL INFORMATION

Year Facility Constructed: 1971 Year Facility Modified: _____
Facility Description: Brick + Concrete w/ FIAT ROOF 2 level Wetwell
2 level Pump room / ELEC ROOM

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: Y
Pump #1: _____ Motor #1: _____
Year Installed: 1971 Year Installed: 1971
Manufacturer: Fairbanks Morse Manufacturer: AC INDUCTION MOTOR
Model and No.: See Attached Model and No.: See attached
Type: Centrifugal Type: _____
NOM efficiency: _____ Horsepower: _____
Design capacity/TDH: _____ Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: 10" MHV + FCO check Variable/Constant: 2 speed
Observed flow: _____ Vertical/Horizontal: Vert
Observed TDH: _____ Motor RPM: _____
Pump curve available: _____

Comments: Original pumps + motors working fine
eventually will need rebuild +/or replacement, should be painted.

Pump #2: _____ Motor #2: _____
Year Installed: SAME ↑ Year Installed: SAME ↑
Manufacturer: _____ Manufacturer: _____
Model and No.: _____ Model and No.: _____
Type: _____ Type: _____
NOM efficiency: _____ Horsepower: _____
Design capacity/TDH: _____ Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: _____ Variable/Constant: Single Speed
Observed flow: _____ Vertical/Horizontal: _____
Observed TDH: _____ Motor RPM: _____
Pump curve available: _____

Comments: _____



Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

General Station Comments: Roof is original NO Leaks @ this time
All exterior Doors should be replaced
Wet well Louvers - BAD

Previous Pump Tests: _____

2 pumps 30000 -
 Roof - 7000
 2 Doors - 2000
 generator - 50000 -
 windows - 2000 -
 ventilation - 10000
 electrical - 30000 -
 \$100000 -

OTHER PIPING AND VALVES



Air relief valves:	<u>NA</u>	Excellent	Good	Fair	Poor
Isolation valves:	<u>Basically N/G</u>	Excellent	Good	Fair	<u>Poor</u>
Piping:	<u>NEED PAINT</u>	Excellent	Good	<u>Fair</u>	Poor
Comments:					

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: Near Ocean
SALT AIR HAS
Caused Corrosion

Standby Generator: Mnfr: IH. / Demco
Model: 6050
Year Installed: 1971
Rating: 40 KW
Fuel Type: DIESEL

Excellent Good Fair Poor

Facility Load:
Ample capacity (Y/N):

Interior Lighting Type: incandescent / Fluorescent

Excellent Good Fair Poor

Lighting Level:

Excellent Good Fair Poor

Exterior Lighting Type: incandescent

Excellent Good Fair Poor

Panel Boards:

Excellent Good Fair Poor

Motor Control Center:

Excellent Good Fair Poor

Disconnect Switches:

Excellent Good Fair Poor

Lightning Protection:

Excellent Good Fair Poor

Fire Alarm System: N/A

Excellent Good Fair Poor

Security System: N/A

Excellent Good Fair Poor

Potential Code Issues:

Comments: OUT of ALL P/S this Generator is 5th WORST

OTHER:

INSTRUMENTATION AND CONTROLS



Flow Meters/Transmitters:	<u>Fischer 1971</u>	Excellent	Good	Fair	<u>Poor</u>
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	<u>MULTISMAAT CONTROL</u>	Excellent	<u>Good</u>	Fair	Poor
SCADA:	<u>MISSION</u>	Excellent	<u>Good</u>	Fair	Poor
Comments:	<u>ELEC COMPONENTS NEAR SALT AIR</u>				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	<u>N/A</u>	Fuel Storage Capacity: _____			
Heating Type:	<u>ELEC WATT HEAT</u>	Excellent	Good	<u>Fair</u>	Poor
Ventilation Type:	<u>FAW + DUCT WORK</u>	Excellent	Good	Fair	<u>Poor</u>
AC System Type:	<u>N/A</u>	Excellent	Good	Fair	Poor
Dehumidification:	<u>N/A</u>	Excellent	Good	Fair	Poor
Louvers:	_____	Excellent	Good	Fair	<u>Poor</u>
Comments:	_____				

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Repair Ventilation System</u>	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Replace Generator</u>	\$
2. <u>Rebuild pump 1 motor 1</u>	\$ <u>20,000</u>
3. <u>Replace Roof</u>	\$ <u>5,000</u>
4. <u>Replace Doors + Windows</u>	\$ <u>3,000</u>
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

10/10/21



CUMBERLAND CONSTRUCTION CO.
TOWN OF WAREHAM, MASS.
PUMPING STATIONS, CONTRACT NO. 6 SECTION A

DATE 11/24/70
B-3947-3
K2R1-062779
1-UNIT

ITEM NO. 4
LOCATION: SOUTH WATER ST.
PUMP NO. 2

MANUFACTURER: FAIRBANKS MORSE
MODEL: FIG. 5443B-32-BF DISCHARGE: 6" FLANGED
TYPE: VERTICAL CLOSE COUPLED NON-CLOG
DESIGN CAPACITY, GPM: 1000
DESIGN T.D.H. FEET OF WATER: 39.5
RATED SPEED, RPM: 1160
ROTATION: CCW - DISCH. POS. #12

MATERIALS OF CONSTRUCTION:

CASING
IMPELLER
CASING WEAR RING
IMPELLER WEAR RING
SHAFT
SHAFT BELLEVE
STUFFING BOX

CAST IRON
BRONZE
BRONZE
BRONZE
STEEL
STAINLESS STEEL
BRONZE-GREASE SEAL

MOUNTING BASE
COUPLING

CAST IRON
METAL-FLEX

MOTOR:

CONTINENTAL
15 HP 1160 RPM - VSS
3/60/460V 40°C RISE

MG1-4.34 Report of Test Form for Induction Motors

CONTINENTAL ELECTRIC CO., Inc.

Newark, N. J.

Rockford, Ill. SO. WATER ST. #1

REPORT OF TESTS

INDUCTION MOTOR

Purchaser -
**PURCELL PUMP
Engineering Corp.**

Date of Test 11-4-71

Continental
F. O. No. G3990

Serial No. G39901

Order No. B.3947-2A

W. S. 15834

NAMEPLATE RATING

Hp Output	Syn. Speed Rpm	Full-Load Speed—Rpm	Phase	Cycles	Volts	Amperes Full Load	Type	Frame Number
<u>15/8.4</u>	<u>1200/900</u>	<u>1175/880</u>	<u>3</u>	<u>60</u>	<u>460</u>	<u>20.5/13.5</u>	<u>WY</u>	<u>326UF</u>

TEMPERATURE RISE

Conditions of Test				Temperature Rise—Deg C					
Hours Run	Line Volts	Line Amperes	Cooling Air Deg C	Stator		Rotor		Commutator Bars	Collector Rings
				Core By Thermometer Method	Windings (Cross Out One) By Resistance Method By Thermometer Method	Core By Thermometer Method	Windings (Cross Out One) By Resistance Method By Thermometer Method		
<u>4/4</u>	<u>460</u>	<u>20.5/13.5</u>	<u>30/31</u>	<u>39/36</u>	<u>38/37</u>				

CHARACTERISTICS

Slip—Per Cent	Amperes Running Light	Secondary Volts at Standstill	Secondary Amperes per Ring at Full Load	Resistance at 25 C (between lines) Ohms
<u>2.1/2.2</u>	<u>12.5/9</u>			<u>.760/1.414</u>

TORQUE AND STARTING CURRENT

Break-Down Torque Lbs at 1 ft radius	Locked-Rotor Torque Lbs at 1 ft radius with—% volts applied	Starting Current Amperes (locked rotor) with—% volts applied
<u>140/110 Calc</u>	<u>18.5/19 @ 48 90 V</u>	<u>51/32 @ 48 90 V</u>

HIGH-POTENTIAL TESTS

Volts A-c for <u>60</u> Sec.	
Stator	Rotor
<u>2000</u>	

EFFICIENCIES AND POWER FACTOR

Efficiency, Per Cent			Power Factor, Per Cent		
Full Load	½ Load	¼ Load	Full Load	½ Load	¼ Load
<u>87/84.5</u>	<u>85/82</u>	<u>81.5/78</u>	<u>79.5/67.5</u>	<u>73.5/60.5</u>	<u>63.5/48</u>

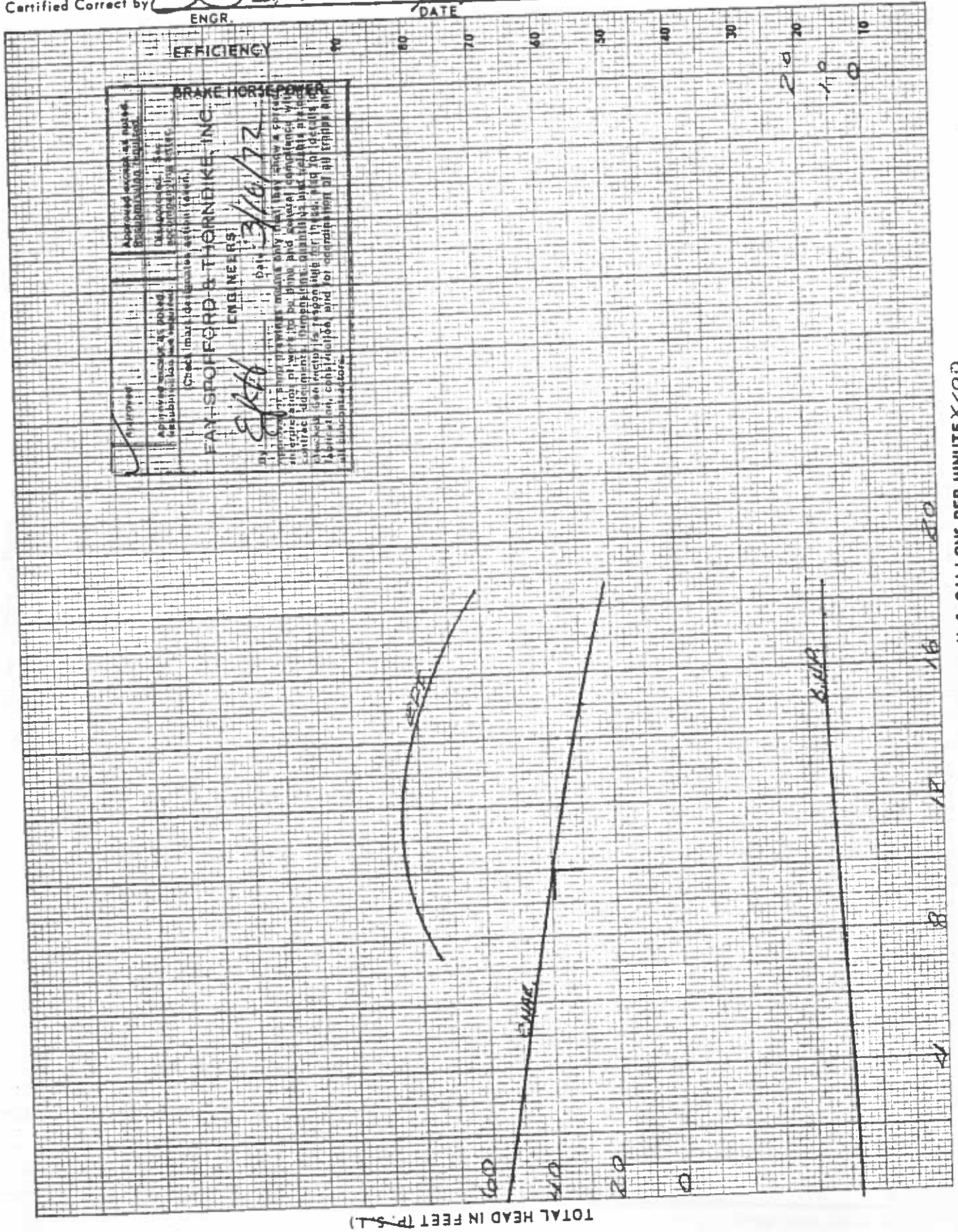
Notes:

Data from test on this motor.
(this or duplicate)

Approved by Edward C. Biller Date 11/24/71
Designing Engineer

PUMP NO. K2R-062770 STAGES 1 SIZE-FIGURE 6" 5443
TESTED 2-22-72 DRIVER T-MTR 15 IMPELLER T4C10M
Certified Correct by [Signature] 2/23/72 IMP. DIA. 1 1/8
ENGR. DATE R.P.M. 1160

CERTIFIED PUMP PERFORMANCE CURVE

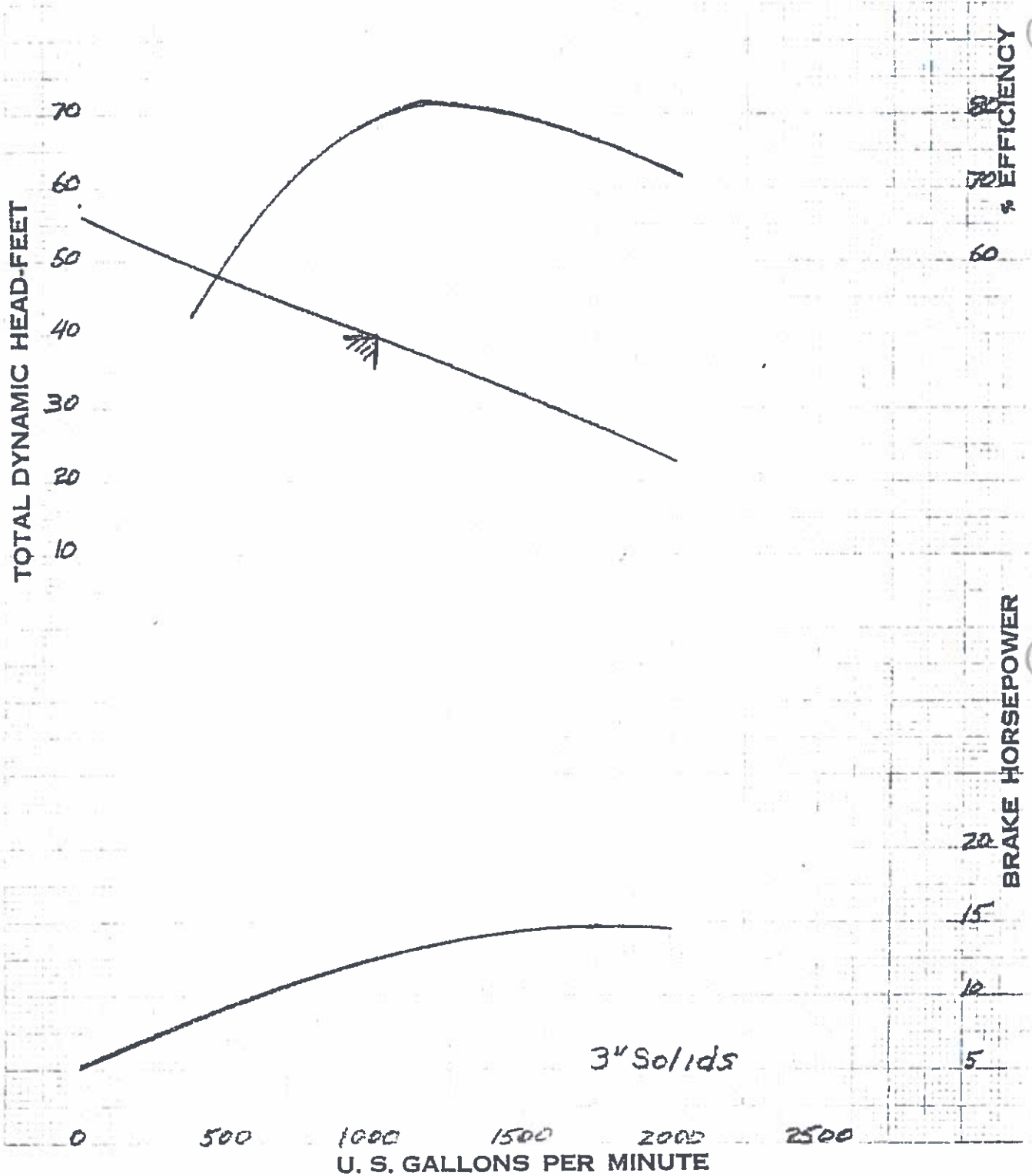


Approved accuracy of pump performance data: _____
Approved accuracy of motor performance data: _____
Approved accuracy of test results: _____
Approved accuracy of test results: _____
Checked by: [Signature] Date: 2/23/72
FAN-SPOFFORD-THORNBIKE, INC.
ENGINEERS

U. S. GALLONS PER MINUTE X 100

TOTAL HEAD IN FEET (P.S.I.)

CENTRIFUGAL PUMP PERFORMANCE



The pump is guaranteed for the set of conditions specified; other points are approximate. Capacity, head and efficiency guarantees are contingent on furnishing the pump with the specified amount of clear, fresh non-aerated water at a temperature of not to exceed 85 degrees F.

CUSTOMER: CUMBERLAND CONST
S. WATER ST. NO 2 - K2R1-062770
6" FIGURE 5443 OPERATED AT 1160 RPM
 IMPELLER T6C1C DIAMETER 11 3/8"
 DRAWN BY: HF DATE: 3/29/71

MG1-4.34 Report of Test Form for Induction Motors

CONTINENTAL ELECTRIC CO., Inc.
Newark, N. J.

Rockford, Ill. 30 WATER ST. #2

REPORT OF TESTS

INDUCTION MOTOR

Purchaser -
**PURCELL PUMP
Engineering Corp.**

Date of Test 11/4/71

Continental F.O. No. G3991

Serial No. G39911

W. S. 13679

Order No. B3947-3A

NAMEPLATE RATING

Hp Output	Syn. Speed Rpm	Full-Load Speed-Rpm	Phase	Cycles	Volts	Amperes Full Load	Type	Frame Number
15	1200	1160	3	60	460	19.2	WV	3240P

TEMPERATURE RISE

Conditions of Test				Temperature Rise—Deg C					
Hours Run	Line Volts	Line Amperes	Cooling Air Deg C	Stator		Rotor		Commutator Bars	Collector Rings
				Core By Thermometer method	Windings (Cross Out One) By Resistance Method By Thermometer Method	Core by Thermometer Method	Windings (Cross Out One) By Resistance Method By Thermometer Method		
4	460	19.2	28	39	39				

CHARACTERISTICS

Slip—Per Cent	Amperes Running Light	Secondary Volts at Standstill	Secondary Amperes per Ring at Full Load	Resistance at 25 C (between lines) Ohms
3.3	10			.680

TORQUE AND STARTING CURRENT

Break-Down Torque Lbs at 1 ft radius	Locked-Rotor Torque Lbs at 1 ft radius with—% volts applied	Starting Current Amperes (locked rotor) with—% volts applied
140 Calc	22 @ 489V	47 @ 489V

HIGH-POTENTIAL TESTS

Volts A-c for <u>60</u> Sec.	
Stator	Rotor
2000	

EFFICIENCIES AND POWER FACTOR

Efficiency, Per Cent			Power Factor, Per Cent		
Full Load	½ Load	¼ Load	Full Load	½ Load	¼ Load
88.5	88	86.5	82.5	77	66

Notes: Data from test on this motor.
(this or duplicate)

Approved by E. J. ... Date 11/27/71
Designing Engineer

Recommended Standard 8-11-1946, NEMA Standard 11-12-1953.

PUMP TEST LOG

Colt Industries
Fairbanks Morse
Pump & Electric Division

So Water St No 2

CUSTOMER
PARCELLS PUMP & ENG. CORP.
 Size 6x8 Fig. 5443B-32A Pump
 Branch LOVELL Order 3-22-72
 Tested By WELLS Date 3-22-72

OPERATIVE CONDITIONS				EQUIPMENT				DATA						
DISCHARGE HEAD "A" FEET	SUCTION HEAD "B" FEET	TOTAL HEAD, FEET A+B+D	U.S. GALLONS PER MIN.	WATER IN P. OUTPUT	% EFF. PUMP	B. H. P. INPUT TO PUMP	SPEED R. P. M.	TORQUE POUNDS	EFF. DRIVER	K. W. INPUT	WATTMETER READING C=	VOLTS	AMPS.	REMARKS
11.5	6.9	22.8	1855		70.9	15.08	1160	52.0						Certified Curve <input checked="" type="checkbox"/>
14.7	6.6	25.3	1750		75.1	14.84	1160	51.1						Curve Approval <input checked="" type="checkbox"/>
21.2	5.6	29.7	1500		78.8	14.3	1160	49.3						Test Report
28.2	5.0	35.2	1250		82.7	13.43	1160	46.4						WITNESS <u>TES</u>
33.9	4.3	39.5	1000		82.2	12.15	1160	41.9						<u>James H. Haman</u>
39.4	3.8	43.9	750		77.5	10.7	1160	37.0						
53.1	3.1	56.2				7.03	1160	24.2						

Serial No. Pump K2R1-062770
 Impeller Symbol T6C1DM
 Diam. 1 3/8 Inches
 Material BR.
 Rating Chart _____

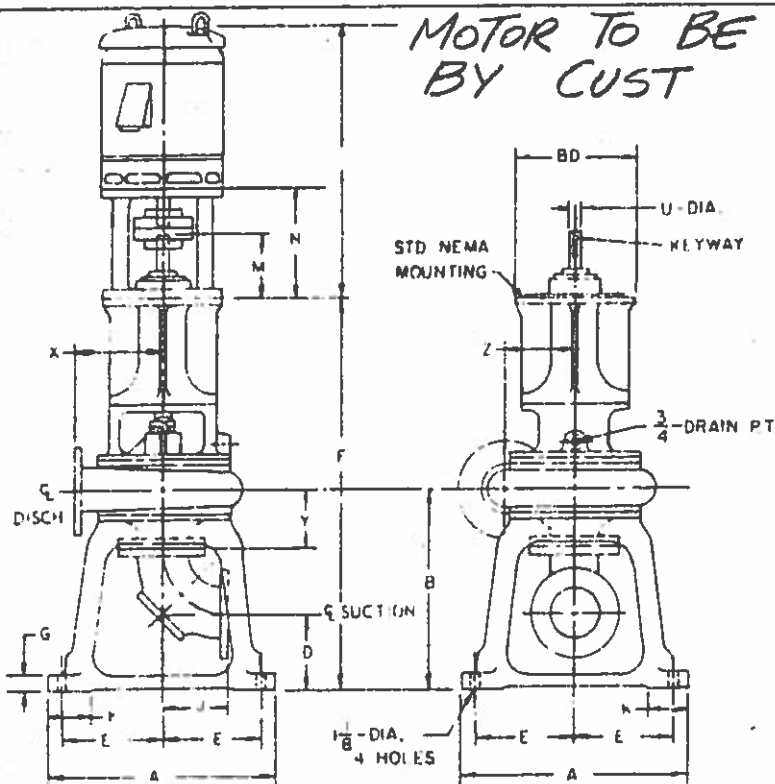
Size of Piezometer 2.75
 Disch. Gauge No. 1160
 Suction Gauge HR.
 Misc. Note 1/2 F1

Motor Engine 15 H. P. (AC-DC)
 Serial No. _____

Pump Driven By 30 H. P. (Dynamometer)
 Direct. Conn. To Pump
 Motor Eff. at 1/2 3/4, 4/4 5/4, 5/4 _____, 5/4 _____
 Same Plate Rating _____

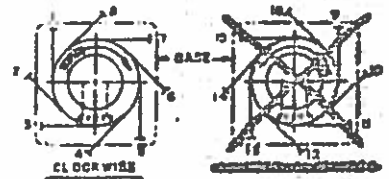
Distance Between Gages { Plus _____ Minus _____ Ft. "D"
 Pipe Inside Diam. { Suction 8 Inches Discharge 6 Inches
 Hydrostatic Press. Test { Suction _____ Inches Discharge _____ Inches

FIGURE 5443B VERTICAL CLOSE-COUPLES NON-CLOG PUMPS
PUMP AND MOTOR DIMENSIONS



MOTOR TO BE FURNISHED & MTD BY CUST

CCW POSITION #12



DRAWINGS ILLUSTRATE THE DISCHARGE POSITIONS AVAILABLE FOR CLOCKWISE & COUNTERCLOCKWISE ROTATION WHEN VIEWED FROM DRIVE END OF PUMP. NO. 1 POSITION IS CONSIDERED STAND. CIRCLE DESIRED POSITION

Pump Size	SUCTION (125*)				DISCHARGE (125*)				B	D	X	Y	Z
	Size	Flange Dia.	Bolts	Bolt Circle	Size	Flange Dia.	Bolts	Bolt Circle					
3	3	7-1/2	(4) 5/8	6	3	7-1/2	(4) 5/8	6	23-3/4	12-3/4	11	5-1/2	7-3/4
4	4	9	(8) 5/8	7-1/2	4	9	(8) 5/8	7-1/2	24-1/4	11-1/2	12	6-1/4	9
6	8	13-1/2	(8) 3/4	11-3/4	6	11	(8) 3/4	9-1/2	24-3/4	7-3/4	13	9	9

Pump Size	Pump Frame	A	E	F	G	J	K	M	N	U	BD	KEYWAY
3	28	24	10-3/4	47-1/2	2	5-1/2	3-7/8	4-1/8	9	1-5/8	12	3/8 x 3/16
3	32	24	10-3/4	47-9/16	2	5-1/2	3-7/8	7-1/8	12	1-7/8	16-1/2	1/2 x 1/4
4	28	24	10-3/4	48-1/2	2	13-1/4	3-7/8	4-1/8	9	1-5/8	12	3/8 x 3/16
4	32	24	10-3/4	48-9/16	2	13-1/4	3-7/8	7-1/8	12	1-7/8	16-1/2	1/2 x 1/4
4	36	24	10-3/4	53-1/8	2	13-1/4	3-7/8	7-1/8	12	2-1/8	16-1/2	1/2 x 1/4
5	28	24	10-3/4	49-1/2	2	7-1/2	3-7/8	4-1/8	9	1-5/8	12	3/8 x 3/16
5	32	24	10-3/4	49-9/16	2	7-1/2	3-7/8	7-1/8	12	1-7/8	16-1/2	1/2 x 1/4
5	36	24	10-3/4	54-1/8	2	7-1/2	3-7/8	7-1/8	12	2-1/8	16-1/2	1/2 x 1/4
6	32	24	10-3/4	49-9/16	2	8	3-7/8	7-1/8	12	1-7/8	16-1/2	1/2 x 1/4

PUMP # 2

CUSTOMER PURCELL PUMP ENG. CORP						P.O. B3947-3			
JOB NAME CUMBERLAND CONST. CO.									
PUMP SIZE & FIGURE NO.		GPM		TDH		RPM		ROT.	
6X8-5443B-32		1000		39.5		1150		CCW	
MOTOR TYPE				H.P.		SYN. R.P.M.			
CUSTOMERS, VSS				15					
PHASE		CYCLES		VOLTS		FRAME			
				460					
CERTIFIED FOR ORDER NO.				CERTIFIED BY				DATE	
KCR1-062770				HEAWTON				11-5-70	

10



CUSTOMER

Size 6 VP CW 1740 Pump
 Branch LOVELACE Order _____
 Tested By NEEL F. THODD Date 2-22-72

OPERATIVE CONDITIONS

120 G.P.M. 300 G.P.M.
 175 F. Tot. Hd. 200 F. Tot. Hd.
 Motor Engine 15-8-TH.P. % Eff. _____
 Serial No. _____ (AC-DC)

EQUIPMENT

Size of { Piezometer } 2.45
 Disch. Gauge No. 43-45-0-1380
 Suction Gage H.G.
 Misc. Note 1041

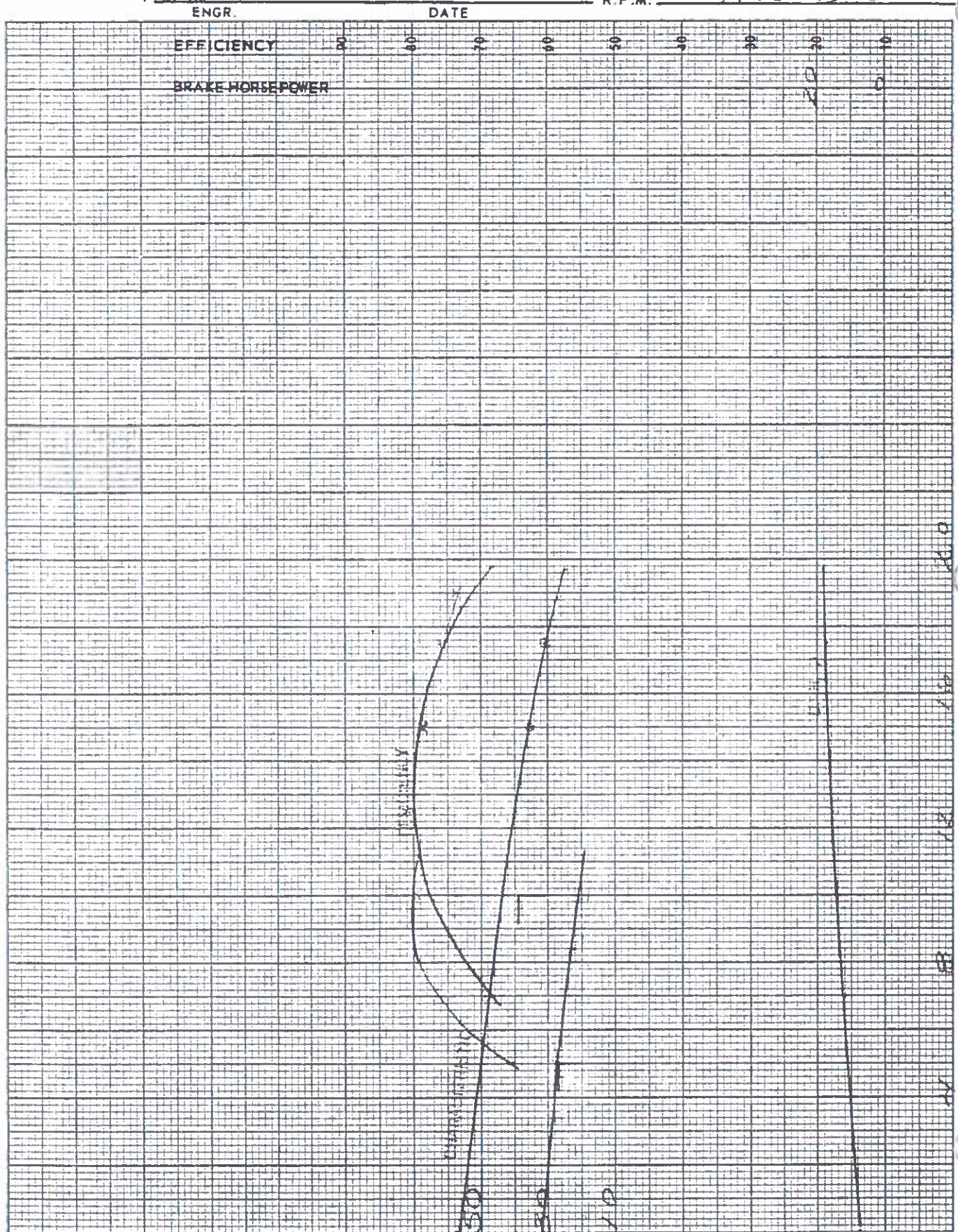
DATA

Serial No. Pump H2R1-062769
 Impeller Symbol T66C12L
 Diam. 1 1/2 Inches
 Material BR.
 Rating Chart _____

DISCHARGE HEAD "A" ACTUAL GAGE HEAD FEET	SUCTION LIFT FEET	VEL. HEAD DIFF. FEET "C"	TOTAL HEAD FEET "A B C D"	U.S. GALLONS PER MIN.	PRESSURE HEAD ON NOZZLE	SIZE OF NOZZLE	WATER H.P. OUTPUT	% EFF. PUMP	B. H. P. INPUT TO PUMP	SPEED R. P. M.	TORQUE POUNDS	EFF. DRIVER	K. W. INPUT	WATTMETER READING C	VOLTS	AMPS.	REMARKS
16.6	6.8	4.6	29.0	1900	11.3	5"		73.5	18.3	1175	62.1						Certified Curve
20.7	6.3	3.9	30.9	1750	9.7	"		75.9	18.0	1175	61.3						Curve Approval
27.1	5.4	3.0	35.4	1500	6.5	"		78.8	17.0	1175	58.0						Test Report
33.6	4.6	2.0	40.2	1250	4.1	"		81.0	15.7	1175	53.4						
39.3	4.0	1.3	44.6	1000	2.1	"	*	79.7	14.15	1175	48.2		5.1	114.1			
44.7	3.5	0.6	48.8	750	13.5	3"		71.1	12.1	1175	41.1						End of Run
58.6	3.1	—	61.7	—	—	"		—	8.39	1175	28.5						
14.3	4.3	1.5	20.1	1100	2.8	5"		78.9	2.08	880	32.2						
19.8	3.7	0.8	24.3	800	18.4	3"		78.4	6.25	880	28.4						
23.8	3.3	0.3	27.4	500	5.9	"	*	47.0	5.17	880	23.5						
31.3	3.1	—	34.4	—	—	"		—	3.54	880	16.1						

Distance Between Gages { Plus _____ Minus _____ } Ft. "D"
 Pipe Inside Diam. { Suction _____ Discharge _____ } Inches
 Max. Pipe Size { Suction _____ Discharge _____ } Inches
 Hydrostatic Press. Test _____ P. S. I.
 Pump Driven By 30 H. P. { Dynamometer _____ Series-Motor _____ Test-Motor No. 4000 }
 Direct. Conn. } To Pump
 Motor Eff. at 1/2 _____, 3/4 _____, 4/4 _____, 5/4 _____ Name Plate Rating
 Released By _____ Day Log No. _____
 Test Log No. _____

PUMP NO. 52R-002769 STAGES 1 SIZE-FIGURE 6" - 5443 B
 TESTED 7-7-71 DRIVER T-MTR 15 IMPELLER T6C12L
 IMP. DIA. 11 7/16"
 Certified Correct by _____ R.P.M. 1175-220



CERTIFIED PUMP PERFORMANCE CURVE

U. S. GAL PER MINUTE 100

SOUTH WATER ST No 1

So. WATER - T.

TOTAL HEAD IN FEET (P.S.L.)

PUMP STATION CONDITION ASSESSMENT

Pump Station: NANUMETTE AIR STN
Address: NANUMETTE AVE
DNSET MA

Inspection Date: 8-16-13
Inspected By: R. WIL

GENERAL INFORMATION

Year Facility Constructed: 1989 Year Facility Modified: _____
Facility Description: Concrete Block Structure, 1 Floor w/ ASPHALT roof
Shingles + Cedar Siding

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: _____
Pump #1: _____ Motor #1: _____
Year Installed: Approx 1997 Year Installed: _____
Manufacturer: Ingersoll Rand Manufacturer: MARATHON ELEC.
Model and No.: U20H-5P Model and No.: _____
Type: COMPRESSOR PACKAGE Rotary Screw Type: _____
NOM efficiency: _____ Horsepower: 20 HP
Design capacity/TDH: 77CFM / 20HP Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: _____ Variable/Constant: _____
Observed flow: _____ Vertical/Horizontal: _____
Observed TDH: _____ Motor RPM: _____
Pump curve available: _____

Comments: AIR SUPPLY STATION ONLY, for 3 STATIONS
w/ Veomans Kettle pumps

Pump #2: _____ Motor #2: _____
Year Installed: Approx 2002 Year Installed: _____
Manufacturer: Quincy Manufacturer: _____
Model and No.: QMB 10ACA 32C Model and No.: _____
Type: COMPRESSOR PACKAGE Type: _____
NOM efficiency: _____ Horsepower: _____
Design capacity/TDH: _____ Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: _____ Variable/Constant: _____
Observed flow: _____ Vertical/Horizontal: _____
Observed TDH: _____ Motor RPM: _____
Pump curve available: _____

Comments: Both compressors in good shape will need routine
MAINTENANCE Bearing replacement, VALVE replacement etc in
next 5+ years per COMPRESSOR MAINT CONTRACTOR.

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

General Station Comments: EXTENSION NEEDS PAINT, ROOF REPLACED, + TRIM
 REPLACED AS NECESSARY.

WE SHOULD CONSIDER ADDING A ROTARY ROOF VENT AS GENSETS
 CREATE A LOT OF HEAT WHICH CAN CAUSE MOTORS TO SHUT
 DOWN.

Previous Pump Tests: _____

Roof 5000 -
 Wood TRIM/SINGLES 5000 -
 Rotary Roof Vent - 1000 -
 12000 - 15000 -

OTHER PIPING AND VALVES

Air relief valves: _____
 Isolation valves: _____
 Piping: _____
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: _____
 Model: _____
 Year Installed: _____
 Rating: _____
 Fuel Type: _____

Excellent	Good	Fair	Poor
Facility Load:			
Ample capacity (Y/N):			

Interior Lighting Type: Flourescent

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: INCANDESCENT

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: Panel has been upgraded + changed many times by several CONTRACTORS w/ NO good electrical drawings AT OUR DISPOSAL. HOWEVER the STATION MOSTLY performs w/OVT problem

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: N/A
 Pressure Gauges: _____
 Other: _____
 SCADA: MISSION
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A
 Heating Type: ELEC HEAT
 Ventilation Type: Louvers + Fans
 AC System Type: N/A
 Dehumidification: N/A
 Louvers: _____
 Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	<u>Fair</u>	Poor
Excellent	Good	<u>Fair</u>	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor

Heat NOT needed in P/S compressors keep but @ 80° +/-

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation
 1. Roof Re
 2. _____
 3. _____
 4. _____
 5. _____

Estimated Capital Project Cost

\$
\$
\$
\$
\$
\$

TOTAL \$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation
 1. Roof Replacement
 2. Compressor Rehab
 3. _____
 4. _____
 5. _____

Estimated Capital Project Cost

\$ 4000.
\$
\$
\$
\$
\$

TOTAL \$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Narrows
Address: Merchants Way
Wareham

Inspection Date: 8-14-13
Inspected By: ES Miller

GENERAL INFORMATION

Year Facility Constructed: 1970 Year Facility Modified: 2004
Facility Description: Concrete + Brick, FLAT ROOF, w/wetwell + 3 levels on
Dry side

PUMP STATION EQUIPMENT

Number of Pumps: 3 Service Area: Yes
Pump #1: 2004 Motor #1: 2004
Year Installed: 2004 Year Installed: 2004
Manufacturer: Cornell Manufacturer: Reliance Elec
Model and No.: 8N7A-VC180B Model and No.: L005EG
Type: Centrifugal Type: Elec Motor
NOM efficiency: _____ Horsepower: 60
Design capacity/TDH: _____ Efficiency: 91.5
Pump RPM: _____ Inverter duty: _____
Valve size and type: CHECK VALVE 10" CLOW Kennedy Variable/Constant: ABB VFD 2004
Observed flow: _____ Vertical/Horizontal: vert
Observed TDH: _____ Motor RPM: 1185
Pump curve available: _____

Comments: HAVE HAD PUMP IMPELLERS + WEAR RINGS REPLACED
SINCE MOW MOTORS GOOD

Pump #2: SAME ↑
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #2: SAME ↑
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

SAME AS 1+2

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

SAME AS 1+2

Comments: _____

~~Pump #4~~ Grinder
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

2012
MONU FLOW
Series A
Muncher

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available _____

Comments: Muncher w/ 6' extension installed in wetwell 2012, controls in 2004

General Station Comments: NEW 2012 DR compressor on 2nd level for Surge tank and Bubbler System

Previous Pump Tests:

30000

Level Control - 5000 -
Roof - 5000 - 7000 -
electrical - 10000 - 15000

OTHER PIPING AND VALVES

- 10" Mueller Chth TN. for Surge Tank new 2012
- (3) MHV+FCO 12 Knife VALVES 1972
- (3) CLOW Kennedy 10" safe VALVES new 2004

Air relief valves:

N/A

Excellent Good Fair Poor

Isolation valves:

Wetwell size

Excellent Good Fair Poor

Piping:

Excellent Good Fair Poor

Comments:

NEW COAT OF PAINT

ELECTRICAL SYSTEMS INSPECTION

Location Classification:

- Dry Location
- Wet or Damp Location
- Wet Corrosive Location

Comments:

Standby Generator:

Mnfr: Caterpillar
 Model: C 6.6 / D1256
 Year Installed: 2008
 Rating: 125 KW
 Fuel Type: Diesel

Excellent Good Fair Poor

Facility Load:

Ample capacity (Y/N):

Interior Lighting Type:

Flourescent

Excellent Good Fair Poor

Lighting Level:

Excellent Good Fair Poor

Exterior Lighting Type:

incandescent

Excellent Good Fair Poor

Panel Boards:

Excellent Good Fair Poor

Motor Control Center:

Excellent Good Fair Poor

Disconnect Switches:

Excellent Good Fair Poor

Lightning Protection:

Excellent Good Fair Poor

Fire Alarm System:

N/A

Excellent Good Fair Poor

Security System:

N/A

Excellent Good Fair Poor

Potential Code Issues:

Comments:

OTHER:

INSTRUMENTATION AND CONTROLS

Have had some issues w/ Pressure
 Switches used for Ld/LAS + level control. Debris + moisture have caused issues
 in Air Lines to Press Switches.

Flow Meters/Transmitters: Hour meters
 Pressure Gauges: _____
 Other: _____
 SCADA: MISSION
 Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A
 Heating Type: EIEC WAM Heaters
 Ventilation Type: LOWERS + FANS w/ DUCTWORK
 AC System Type: N/A
 Dehumidification: N/A
 Louvers: _____
 Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: North BLVD
 Address: North BLVD
ONSET, MA

Inspection Date: 8-16-13
 Inspected By: B Miller

GENERAL INFORMATION

Year Facility Constructed: 1971 Year Facility Modified: 2009
 Facility Description: Brick + Concrete Structure 2 level pump room + Elec Room on
DRY side. Wet well is concrete VAULT, UNDERGROUND, accessible
through a manhole PUMP room IS METAL CAN

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: Y

Pump #1: 2009 Motor #1: 2009
 Year Installed: 2009 Year Installed: 2009
 Manufacturer: FAIRBANKS MORSE Manufacturer: US MOTOR
 Model and No.: 1832783-0 Model and No.: 98697374-100
 Type: CENTRIFUGAL Type: EIEC
 NOM efficiency: _____ Horsepower: 7.5
 Design capacity/TDH: _____ Efficiency: 91%
 Pump RPM: _____ Inverter duty: _____
 Valve size and type: check valve 8" Fairbanks Variable/Constant: CONSTANT
 Observed flow: _____ Vertical/Horizontal: VERT
 Observed TDH: _____ Motor RPM: 1175
 Pump curve available: _____

Comments: 5400 series Pumps installed by Pumping Systems INC.
Whitman, MA.

Pump #2: SAME ↑
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Comments: _____

Motor #2: SAME ↑
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available _____

Comments: _____

General Station Comments: Roof was replaced 2012

Wetwell should be checked out before anyone is allowed to enter.
LAST ENTRY ATTEMPT found stairs + Hand railings in VERY POOR CONDITION
and I would suspect they are unsafe for use at this time

PAINT INTERIOR WALLS, PIPES + PUMPS

Previous Pump Tests:

Wetwell stairs + Railing to be replaced 5000-
Electrical - 10000 -
expans/Door - 1000
generator - 50000
Heaters - 2000

~~70000 - 80000~~
60000

OTHER PIPING AND VALVES

(3) 8" Gate Valves Fairbanks
(2) 6" " " " " " " }
to 70000
PAINT ALL

Air relief valves:	<u>N/A</u>	Excellent	Good	Fair	Poor
Isolation valves:	<u>FROZEN</u>	Excellent	Good	Fair	<u>Poor</u>
Piping:	<u>PAINT ALL</u>	Excellent	Good	<u>Fair</u>	Poor
Comments:					

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: DEMCO
 Model: 30SX 90E
 Year Installed: 1971
 Rating: _____
 Fuel Type: Diesel

Excellent	Good	Fair	<u>Poor</u>
Facility Load:			
Ample capacity (Y/N): <u>RUNS 1 PUMP ONLY</u>			

Interior Lighting Type: INCANDESCENT + FLOUORESCENT

Excellent	Good	<u>Fair</u>	Poor
-----------	------	-------------	------

Lighting Level: _____

Excellent	Good	<u>Fair</u>	Poor
-----------	------	-------------	------

Exterior Lighting Type: INCANDESCENT

Excellent	Good	Fair	<u>Poor</u>
-----------	------	------	-------------

Panel Boards: _____

Excellent	Good	<u>Fair</u>	Poor
-----------	------	-------------	------

Motor Control Center: _____

Excellent	Good	Fair	<u>Poor</u>
-----------	------	------	-------------

Disconnect Switches: _____

Excellent	Good	<u>Fair</u>	Poor
-----------	------	-------------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: Generators unreliable old, should be replaced before any others. NPGA SALT WATER HAVE HAD ISSUES + HAVE REPLACED DISCONNECT SWITCHES, MCC PANEL EQUIPMENT ALSO.

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	_____	Excellent	Good	Fair	Poor
SCADA:	Mission	Excellent	Good	Fair	Poor
Comments:	OCDen Bubbler tube system works fine but use of low should plan to replace w/ MULTITRODE or similar type device				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	N/A	Fuel Storage Capacity:	N/A		
Heating Type:	FLEC with HEATER	Excellent	Good	Fair	Poor
Ventilation Type:	Fans + Duct work MOTORS N/G	Excellent	Good	Fair	Poor
AC System Type:	N/A	Excellent	Good	Fair	Poor
Dehumidification:	N/A	Excellent	Good	Fair	Poor
Louvers:	works	Excellent	Good	Fair	Poor
Comments:	_____				

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. Generator Replacement	\$ see ASNE PROPOSAL
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. Wetwell integrity should be checked - see notes.	\$ 5000.
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation	Estimated Capital Project Cost
1. LEVEL CONTROL Equipment +/- \$5000	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$

PUMP STATION CONDITION ASSESSMENT

Pump Station: Oak ST
 Address: _____

Inspection Date: 7-17-13
 Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 2010 Year Facility Modified: _____
 Facility Description: outside Pump Station with Weather tight control Panel

PUMP STATION EQUIPMENT

Number of Pumps: <u>2</u>	Service Area: <u>Outside</u>
Pump #1:	Motor #1:
Year Installed: <u>2010</u>	Year Installed: <u>2010</u>
Manufacturer: <u>ABS</u>	Manufacturer: <u>ABS</u>
Model and No.: <u>AFPK1049.5M75/4FM</u>	Model and No.: <u>AFPK1049.5M75/4FM</u>
Type: <u>Submersible Pump</u>	Type: <u>Submersible Pump</u>
NOM efficiency: <u>63%</u>	Horsepower: <u>10</u>
Design capacity/TDH: <u>44</u>	Efficiency: _____
Pump RPM: <u>1750</u>	Inverter duty: _____
Valve size and type: <u>4" check valve</u>	Variable/Constant: <u>Constant VFD</u>
Observed flow: _____	Vertical/Horizontal: <u>Vertical</u>
Observed TDH: _____	Motor RPM: <u>1750</u>
Comments: _____	Pump curve available: <u>Pump + motor Attached.</u>

Pump #2:	Motor #2:
Year Installed: <u>Same as Above</u>	Year Installed: <u>Same as Above</u>
Manufacturer: _____	Manufacturer: _____
Model and No.: _____	Model and No.: _____
Type: _____	Type: _____
NOM efficiency: _____	Horsepower: _____
Design capacity/TDH: _____	Efficiency: _____
Pump RPM: _____	Inverter duty: _____
Valve size and type: _____	Variable/Constant: _____
Observed flow: _____	Vertical/Horizontal: _____
Observed TDH: _____	Motor RPM: _____
Comments: _____	Pump curve available: _____

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: Outside station - good shape

*Paint cabinet
500 - Control
8/11/15*

Previous Pump Tests: _____

OTHER PIPING AND VALVES

Air relief valves: N/A

Isolation valves: 6" GAP

Piping: _____

Comments: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location

Wet or Damp Location

Wet Corrosive Location

Comments: _____

Standby Generator: Mnfr: Generac

Model: 11573580100

Year Installed: 2010

Rating: 35 KW

Fuel Type: Natural GAS

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Facility Load: _____

Ample capacity (Y/N): _____

Interior Lighting Type: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Lighting Level: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Exterior Lighting Type: None

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Panel Boards: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Motor Control Center: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Disconnect Switches: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Lightning Protection: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Security System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Potential Code Issues: _____

Comments: _____

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Multi SMART
 Pressure Gauges: None
 Other: Multi SMART
 SCADA: Mission Communication
 Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: _____
 Heating Type: _____
 Ventilation Type: _____
 AC System Type: N/A
 Dehumidification: N/A
 Louvers: _____

Fuel Storage Capacity: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Comments: May want to beef up retuning wall. saw that a rock has fallen down from the wall. Use Flow Fill to fill in crevices.

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Painting Cabinet</u>	\$
2. <u>Painting generator</u>	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____



Pump performance curves AFP 1049 60 HZ

Curve number

Reference curve
AFP 1049

405GPM @ 44"TDH

Discharge
DN100

Frequency
60 Hz

Density
62.43 lb/ft³

Viscosity
0.0000169 ft²/s

Testnorm
Hydraulic Institute

Rated speed
1700 rpm

Date
2009-05-07

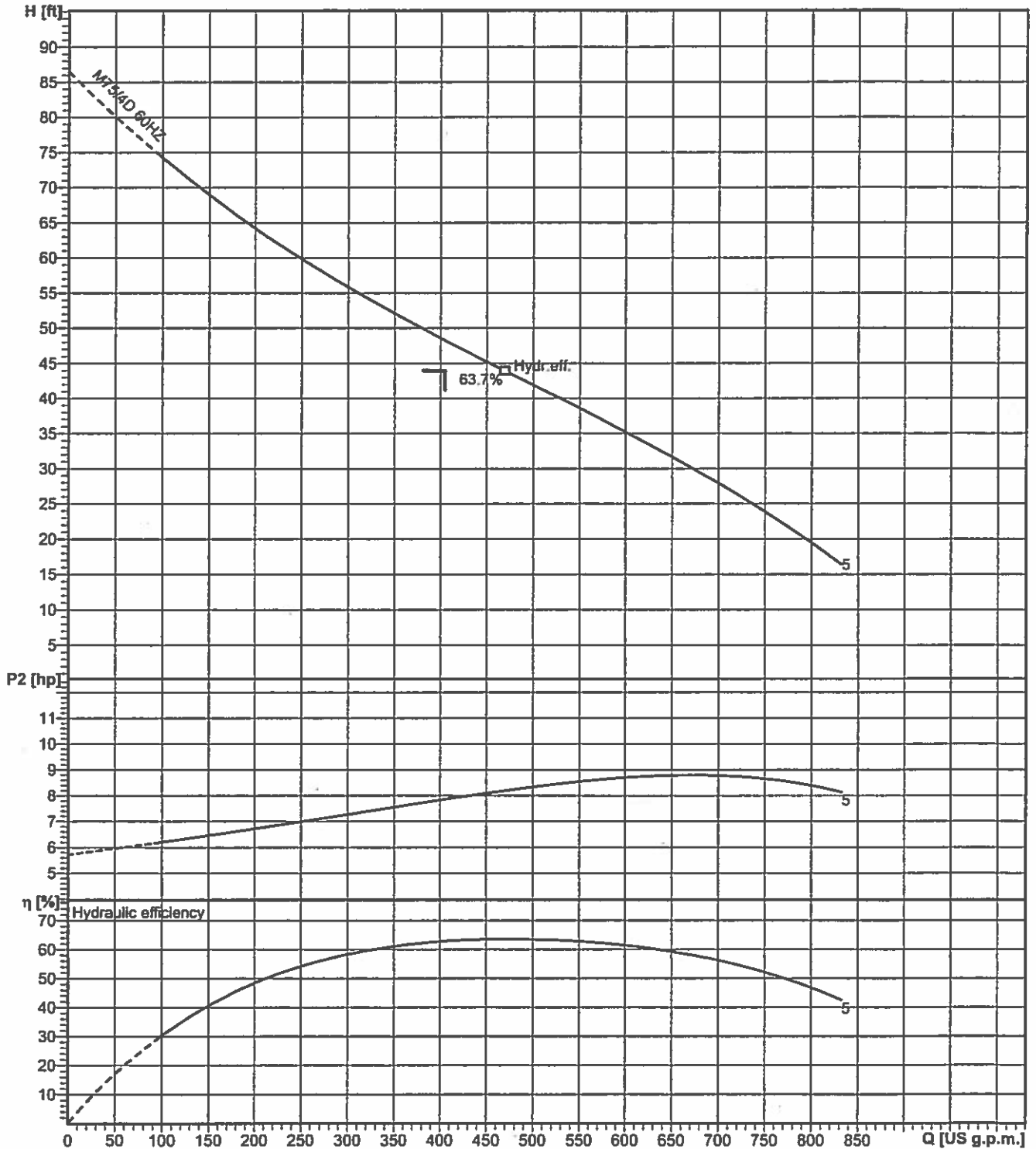
Flow
420 US g.p.m.

Head
47.3 ft

Rated power
7.93 hp

Hydraulic efficiency
63.2 %

NPSH
4.6 ft



Impeller size
8.82 inch

N° of vanes
1

Impeller
ContraBlock impeller, 1 vane

Solid size
3 1/8"

Revision 2007-04-20

ABS reserves the right to change any data and dimensions without prior notice and can not be held responsible for the use of information contained in this software.

ABSEL PRO 1.7.2 / 2007-02-08

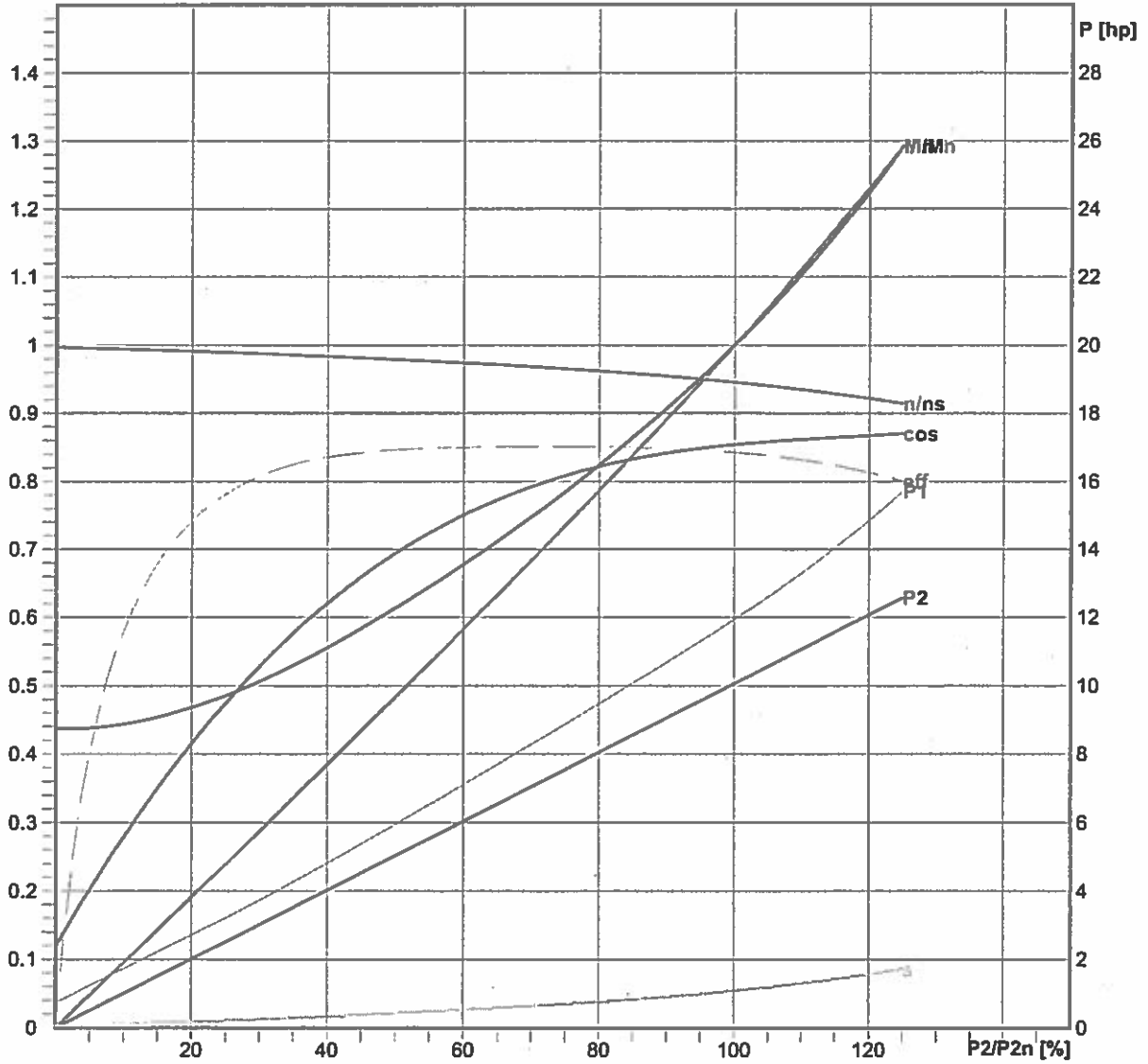


Motor performance curve M75/4D 60HZ

Frequency
60 Hz

405GPM @ 44'TDH

Rated power 10.1 hp	Service factor	Nominal speed 1700 rpm	Number of poles 4	Rated voltage 230 V	Date 2009-05-07
------------------------	----------------	---------------------------	----------------------	------------------------	--------------------



Loading	No load	25 %	50 %	75 %	100 %	125 %
P1 [hp]	0.7305	3.217	5.945	8.871	11.94	15.71
P2 [hp]	0	2.514	5.029	7.543	10.06	12.57
I [A]	11.44	12.7	16.04	20.54	26.16	33.8
eff [%]	0	78.15	84.59	85.03	84.26	80.02
cos	0.1195	0.4743	0.6938	0.8087	0.854	0.8701
n [rpm]	1794	1781	1762	1738	1702	1646
M [lbf ft]	0	7.416	14.99	22.8	31.04	40.12
s [%]	0.3318	1.063	2.096	3.46	5.437	8.557

Tolerance according to VDE 0530 T1 12.84 for rated power

Starting current 141 A	Starting torque 51.6 lbf ft	Moment of inertia 0.247 lb ft ²	
---------------------------	--------------------------------	---	--

PUMP STATION CONDITION ASSESSMENT

Pump Station: Parkwood
Address: _____

Inspection Date: _____
Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 2010 Year Facility Modified: _____
Facility Description: weather tight control Panel

PUMP STATION EQUIPMENT

Number of Pumps: 2

Service Area: outside

Pump #1:
Year Installed: April 2010
Manufacturer: ABS
Model and No.: AFPK1049.3 M105/4FM
Type: 4" submersible Pump
NOM efficiency: _____
Design capacity/TDH: 69
Pump RPM: 1750
Valve size and type: 6" 3" check valve
Observed flow: _____
Observed TDH: _____

Motor #1:
Year Installed: April 2010
Manufacturer: ABS
Model and No.: AFPK1049.3 M105/4FM
Type: 4" submersible Pump
Horsepower: 14
Efficiency: 84.5 @ 100%
Inverter duty: _____
Variable/Constant: Constant / soft starters
Vertical/Horizontal: Vertical
Motor RPM: 1750
Pump curve available: Attached.

Comments: _____

Pump #2:
Year Installed: Same as Above
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #2:
Year Installed: Same as Above
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #3:
Year Installed: N/A
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: N/A
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: _____

Previous Pump Tests: _____

Paint 500 -

OTHER PIPING AND VALVES

Air relief valves: N/A
 Isolation valves: New 2010 6" Gate
 Piping: New 2010
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: Weather-tight Control Panel

Standby Generator: Mnfr: Generac
 Model: 11575480100
 Year Installed: 2010
 Rating: 35 KW
 Fuel Type: Natural GAS

Excellent	Good	Fair	Poor
-----------	------	------	------

Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: Weather tight lighting

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: Outside no lights

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: New 2010

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: New 2010

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: _____

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	_____	Excellent	Good	Fair	Poor
SCADA:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	<u>Natural Gas for generator</u>	Fuel Storage Capacity:	<u>N/A</u>		
Heating Type:	<u>Small Heater in weather tight control panel</u>	Excellent	<u>Good</u>	Fair	Poor
Ventilation Type:	<u>N/A</u>	Excellent	Good	Fair	Poor
AC System Type:	<u>N/A</u>	Excellent	Good	Fair	Poor
Dehumidification:	<u>N/A</u>	Excellent	Good	Fair	Poor
Louvers:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

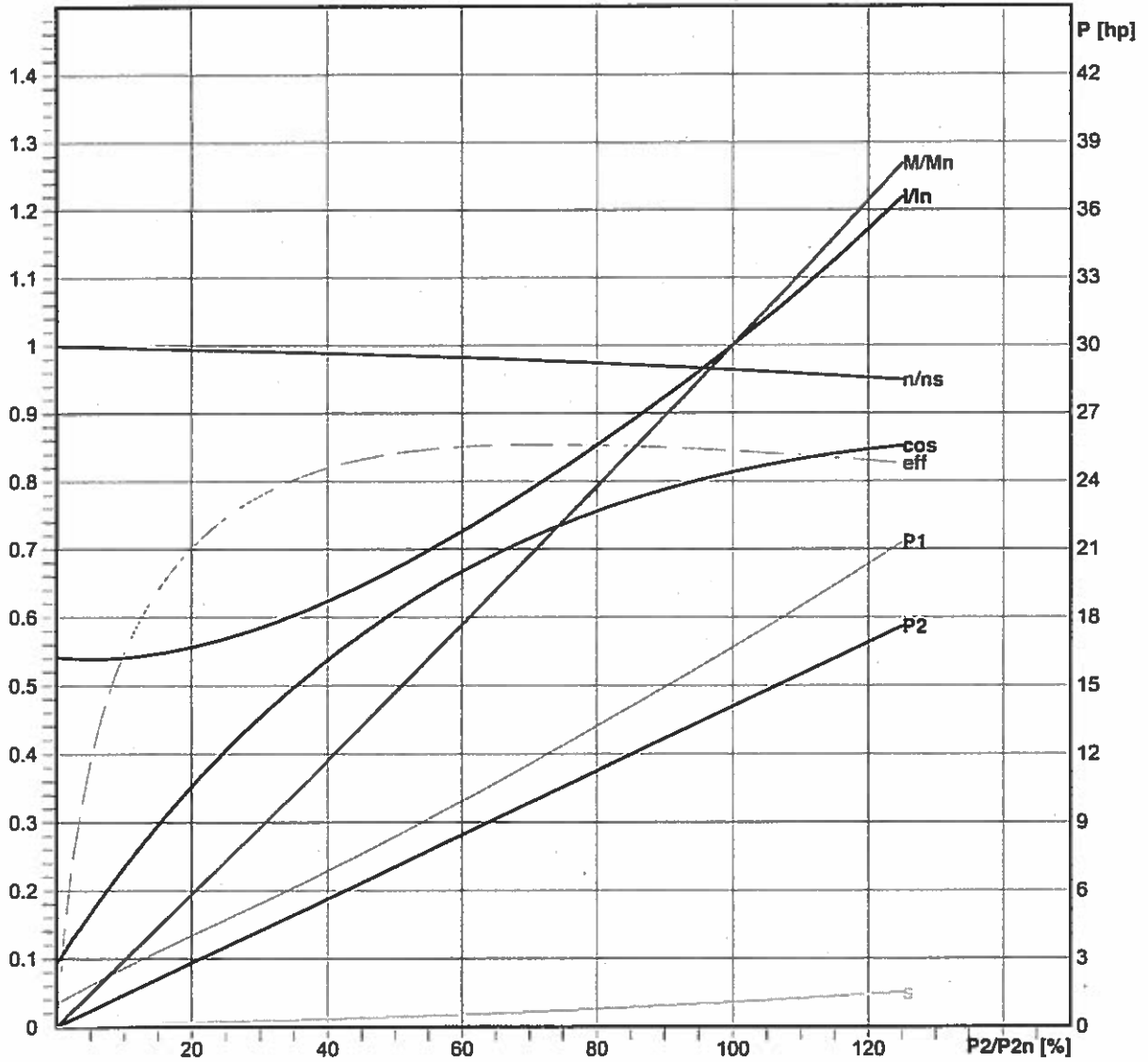


Motor performance curve M105/4D 60HZ

Frequency
60 Hz

330GPM @ 69"TDH

Rated power 14.1 hp	Service factor	Nominal speed 1735 rpm	Number of poles 4	Rated voltage 208 V	Date 2009-05-08
------------------------	----------------	---------------------------	----------------------	------------------------	--------------------



Loading	No load	25 %	50 %	75 %	100 %	125 %
P1 [hp]	1.023	4.719	8.373	12.37	16.67	21.3
P2 [hp]	0	3.52	7.04	10.56	14.08	17.6
I [A]	23	24.13	28.48	34.77	42.44	51.75
eff [%]	0	74.6	84.09	85.36	84.45	82.62
cos	0.09204	0.4048	0.6084	0.7366	0.8132	0.852
n [rpm]	1799	1786	1774	1757	1735	1709
M [lbf ft]	0	10.35	20.85	31.57	42.63	54.09
s [%]	0.05666	0.7723	1.455	2.378	3.617	5.054

Tolerance according to VDE 0530 T1 12.84 for rated power

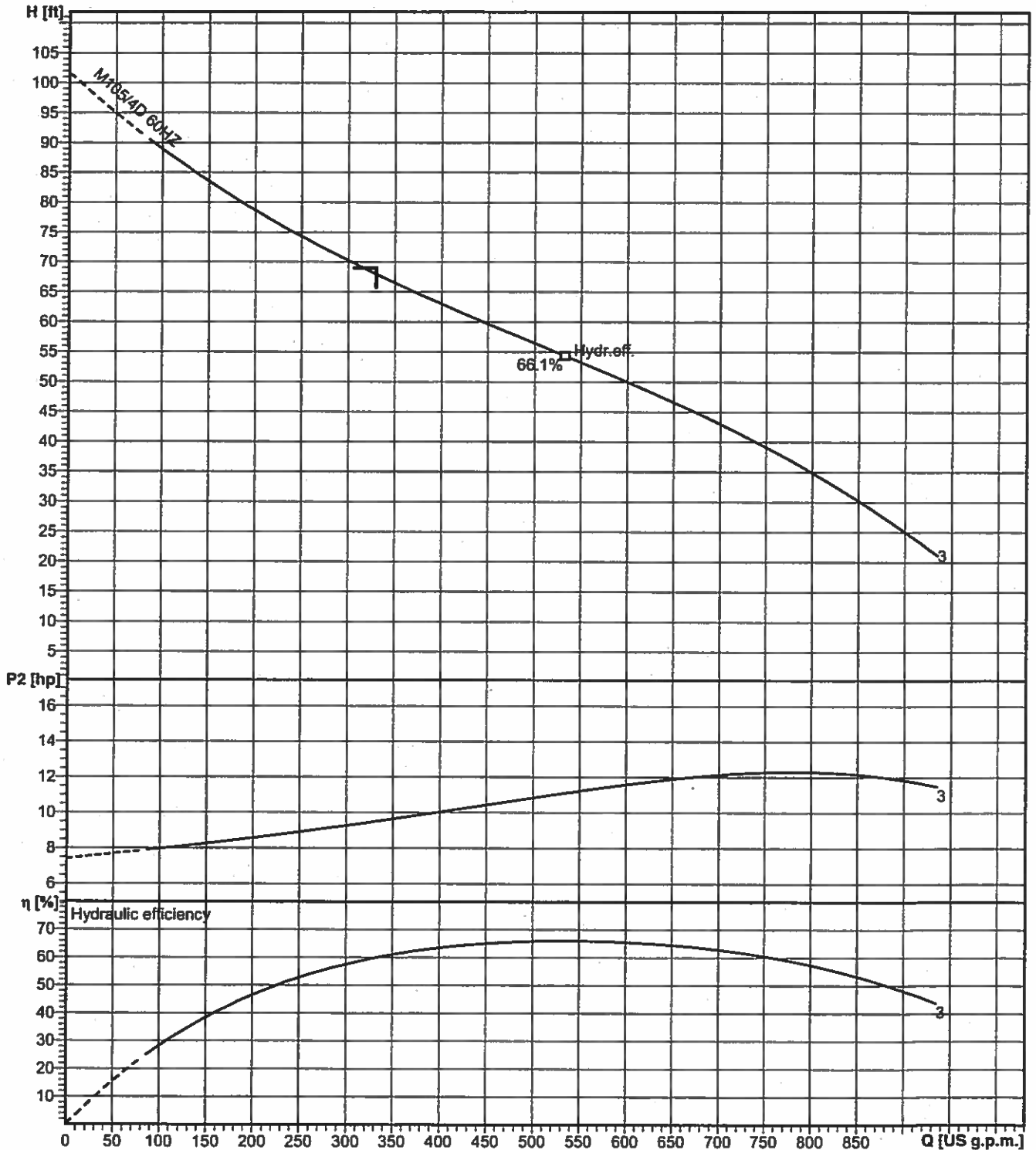
Starting current 243 A	Starting torque 95.9 lbf ft	Moment of inertia	
---------------------------	--------------------------------	-------------------	--



Pump performance curves AFP 1049 60 HZ

Curve number
Reference curve
AFP 1049

330GPM @ 69"TDH			Discharge DN100	Frequency 60 Hz
Density 62.43 lb/ft ³	Viscosity 0.0000169 ft ² /s	Testnorm Hydraulic Institute	Rated speed 1735 rpm	Date 2009-05-08
Flow 328 US g.p.m.	Head 68.1 ft	Rated power 9.46 hp	Hydraulic efficiency 59.6 %	NPSH 3.9 ft



Impeller size 9.33 inch	N° of vanes 1	Impeller ContraBlock impeller, 1 vane	Solid size 3 1/8"	Revision 2007-04-20
----------------------------	------------------	--	----------------------	------------------------

ABS reserves the right to change any data and dimensions without prior notice and can not be held responsible for the use of information contained in this software.

ABSEL PRO 1.7.2 / 2007-02-08

PUMP STATION CONDITION ASSESSMENT

Pump Station: Peter Cooper
 Address: P. Cooper Drive
Wareham

Inspection Date: 8-16-13
 Inspected By: R. Miller

GENERAL INFORMATION

Year Facility Constructed: 1989? Year Facility Modified: 2012
 Facility Description: Submersible pumps in metal can. Free standing Electrical enclosures

PUMP STATION EQUIPMENT

Number of Pumps:	<u>2</u>	Service Area:	<u>N</u>
SUBMERSIBLE		Motor #1:	
Pump #1:	<u>2012</u>	Year Installed:	<u>2012</u>
Year Installed:		Manufacturer:	
Manufacturer:	<u>ABS</u>	Model and No.:	
Model and No.:	<u>Piranha S18/2w</u>	Type:	
Type:	<u>Submersible</u>	Horsepower:	<u>2.4 Hp</u>
NOM efficiency:		Efficiency:	
Design capacity/TDH:	<u>max 426 gpm / 105' TDH</u>	Inverter duty:	
Pump RPM:	<u>3450</u>	Variable/Constant:	<u>CONSTANT</u>
Valve size and type:		Vertical/Horizontal:	
Observed flow:		Motor RPM:	
Observed TDH:	<u>32.8'</u>	Pump curve available:	

Comments: Control panel pumps + floats upgraded 2012
by Williamson FIEC PUMPS INCLUDE MOTORS

Pump #2: SAME ↑
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #2: SAME ↑
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: Single ph 230V

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments:

Mechanicals recently upgraded
F/m could use ATW
Remove old Genset motor + Box.

Previous Pump Tests:

~~ATW~~ Force MAIN in VALVE Chambers
5000 -

OTHER PIPING AND VALVES

2" Discharge Piping in Concrete VAULT

(2) check valves + Piping should be painted
(2) gate valves

POOR DESIGN
unable to remove
VALVES w/o Draining F/m

Air relief valves: _____
 Isolation valves: _____
 Piping: _____
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

They show some rust from DAMP LOCATION SHOULD BE PAINTED

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: IN NEMA BOXES

Standby Generator: Mnfr: SEE
 Model: _____
 Year Installed: _____
 Rating: _____
 Fuel Type: _____

Excellent	Good	Fair	Poor
Facility Load:			
Ample capacity (Y/N):			

Interior Lighting Type: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: TRANSFER SWITCH for PORTABLE PORTABLE Generator installed 2002

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: N/A

Pressure Gauges: N/A

Other: N/A

B/CADA: MISSION

Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A

Heating Type: _____

Ventilation Type: _____

AC System Type: _____

Dehumidification: _____

Louvers: _____

Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. <u>✓ E/M valves paint etc.</u>	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Pinehurst
 Address: _____

Inspection Date: 8-16-2013
 Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 1978-79 Year Facility Modified: 2011
 Facility Description: Brick building, ~~Asph~~ Shingles

PUMP STATION EQUIPMENT

Number of Pumps: <u>2</u>	Service Area: <u>No</u>
Pump #1:	Motor #1:
Year Installed: <u>2011</u>	Year Installed: <u>U.S. Motor/2011</u>
Manufacturer: <u>ITT FIYGT</u>	Manufacturer: <u>U.S. Motor</u>
Model and No.: <u>01 0860 76503B</u>	Model and No.: <u>9869 9295-100</u>
Type: <u>Centrifugal Pump</u>	Type: <u>cc AKE</u>
NOM efficiency: <u>90.2</u>	Horsepower: <u>15</u>
Design capacity/TDH: _____	Efficiency: <u>90.2 88.5</u>
Pump RPM: <u>1160</u>	Inverter duty: _____
Valve size and type: <u>6" 1/2" Discharge side Knife Gate</u>	Variable/Constant: <u>VFD</u>
Observed flow: _____	Vertical/Horizontal: <u>VERTICAL</u>
Observed TDH: <u>54'</u>	Motor RPM: <u>1175</u>
	Pump curve available: _____

Comments: Frame Number F7-113

Pump #2:	Motor #2:
Year Installed: <u>Same As Above</u>	Year Installed: <u>Same As Above</u>
Manufacturer: <u>ITT FIYGT</u>	Manufacturer: _____
Model and No.: _____	Model and No.: _____
Type: _____	Type: _____
NOM efficiency: _____	Horsepower: _____
Design capacity/TDH: _____	Efficiency: _____
Pump RPM: _____	Inverter duty: _____
Valve size and type: _____	Variable/Constant: _____
Observed flow: _____	Vertical/Horizontal: _____
Observed TDH: _____	Motor RPM: _____
	Pump curve available: _____

Comments: _____

Clear Back fence line
Paint stairs

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

General Station Comments: *Gutter Down spouts missing
 Needs to be reshingled and new trim
 Asphalt shingles okay - may want to replace snow - look worn
 Lights outside should be fixed or replaced
 New doors or at least repaint*

Previous Pump Tests: _____

*Roof 5000 -
 wood trim 5000 -
 wood shingles 5000 -
 generator 5000 -
 Electrical 10000
 70000 -*

OTHER PIPING AND VALVES

Air relief valves: _____
 Isolation valves: Isolation inflow
VALVE DOES NOT WORK
 Piping: REPAIRED PIPING WHEN
STATION WAS REBIDDED.
 Comments: 4KG CHECK VALVE

Excellent	Good	Fair	Poor
Excellent	Good	Fair	<u>Poor</u>
Excellent	<u>Good</u>	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mnfr: Superior
 Model: 60R131
 Year Installed: 1978
 Rating: 60 KW 1800 RPM
 Fuel Type: Diesel

Excellent Good Fair Poor
OLD
 Facility Load: _____
 Ample capacity (Y/N): Yes

Interior Lighting Type: Fluorescent

Excellent Good Fair Poor

Lighting Level: ---

Excellent Good Fair Poor

Exterior Lighting Type: needs replacing

Excellent Good Fair Poor

Panel Boards: Sylvania

Excellent Good Fair Poor

Motor Control Center: _____

Excellent Good Fair Poor

Disconnect Switches: _____

Excellent Good Fair Poor

Lightning Protection: _____

Excellent Good Fair Poor

Fire Alarm System: NONE

Excellent Good Fair Poor

Security System: NONE

Excellent Good Fair Poor

Potential Code Issues: _____

Comments: Generator - OLD

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	<u>Mission's MT&PC</u>	Excellent	<u>Good</u>	Fair	Poor
SCADA:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	_____	Fuel Storage Capacity: _____			
Heating Type:	<u>Electric</u>	Excellent	Good	Fair	Poor
Ventilation Type:	_____	Excellent	Good	Fair	Poor
AC System Type:	<u>NONE</u>	Excellent	Good	Fair	Poor
Dehumidification:	<u>Installed 8-12</u>	Excellent	<u>Good</u>	Fair	Poor
Louvers:	_____	Excellent	<u>Good</u>	Fair	Poor

Comments: May want to replace thermostats for heaters. Work but very old.
Missing Down Spouts for Gutters.

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
<u>1. Shingles (side) Trim Boards</u>	\$
<u>2. Gutter Down spouts missing</u>	\$
<u>3.</u>	\$
<u>4.</u>	\$
<u>5.</u>	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
<u>1.</u>	\$
<u>2.</u>	\$
<u>3.</u>	\$
<u>4.</u>	\$
<u>5.</u>	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
<u>1.</u>
<u>2.</u>
<u>3.</u>
<u>4.</u>
<u>5.</u>

PUMP STATION CONDITION ASSESSMENT

Pump Station: Riverside
Address: Riverside Dr
CONSET MA

Inspection Date: 9-10-11
Inspected By: BNA

GENERAL INFORMATION

Year Facility Constructed: 1999 1996 Year Facility Modified: _____
Facility Description: Remold Prefab wetwell - METAL ENCLOSURES 1) for Genet, 1) for
ELEC EQUIPMENT

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: NO
Pump #1: _____ Motor #1: _____
Year Installed: 1996 Year Installed: _____
Manufacturer: Flygt Manufacturer: _____
Model and No.: CP 3102 MT Model and No.: _____
Type: Submersible Type: _____
NOM efficiency: _____ Horsepower: 5
Design capacity/TDEH: _____ Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: 6" V VALVE Variable/Constant: _____
Observed flow: _____ Vertical/Horizontal: _____
Observed TDEH: _____ Motor RPM: _____
Pump curve available: _____
Comments: 50 Amp Breaker

Pump #2: _____ Motor #2: _____
Year Installed: 1996 SAME ↑ Year Installed: _____
Manufacturer: _____ Manufacturer: _____
Model and No.: _____ Model and No.: _____
Type: _____ Type: _____
NOM efficiency: _____ Horsepower: _____
Design capacity/TDEH: _____ Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: _____ Variable/Constant: _____
Observed flow: _____ Vertical/Horizontal: _____
Observed TDEH: _____ Motor RPM: _____
Pump curve available: _____

Comments: 30 Amp Breaker

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments:

Brush could be trimmed from around
enclosures. Clean elec. area near/AT transfer switch

Replace cabinet
Electrical

5000 -

5000 -

10000

Previous Pump Tests:

Original pump test report available @ P/S
280 gpm @ 27 TDH

10,000
gpm

OTHER PIPING AND VALVES

Air relief valves:	<u>N/A</u>	Excellent	Good	Fair	Poor
Isolation valves:	<u>6" LUBE + EXERCISE</u>	Excellent	Good	Fair	Poor
Piping:	<u>6"</u>	Excellent	Good	Fair	Poor
Comments:	<u>6" PIPING + VALVES IN MANHOLE - LUBE + EXERCISE EVERY 1/4</u>				

ELECTRICAL SYSTEMS INSPECTION

Location Classification:	<input checked="" type="checkbox"/> Dry Location <input type="checkbox"/> Wet or Damp Location <input type="checkbox"/> Wet Corrosive Location	Comments:
--------------------------	--	-----------

Standby Generator:	Mnfr: <u>Generac</u> Model: <u>96A07032-S</u> Year Installed: <u>1996</u> Rating: Fuel Type: <u>NAT GAS</u>	Excellent <u>Good</u> Fair Poor Facility Load: Ample capacity (Y/N): <u>Y</u>
--------------------	---	--

Interior Lighting Type:	<u>INCANDESCENT</u>	Excellent	<u>Good</u>	Fair	Poor
-------------------------	---------------------	-----------	-------------	------	------

Lighting Level:		Excellent	Good	<u>Fair</u>	Poor
-----------------	--	-----------	------	-------------	------

Exterior Lighting Type:	<u>N/A</u>	Excellent	Good	Fair	Poor
-------------------------	------------	-----------	------	------	------

Panel Boards:		Excellent	<u>Good</u>	Fair	Poor
---------------	--	-----------	-------------	------	------

Motor Control Center:		Excellent	Good	<u>Fair</u>	Poor
-----------------------	--	-----------	------	-------------	------

Disconnect Switches:		Excellent	<u>Good</u>	Fair	Poor
----------------------	--	-----------	-------------	------	------

Lightning Protection:		Excellent	Good	Fair	Poor
-----------------------	--	-----------	------	------	------

Fire Alarm System:		Excellent	Good	Fair	Poor
--------------------	--	-----------	------	------	------

Security System:		Excellent	Good	Fair	Poor
------------------	--	-----------	------	------	------

Potential Code Issues:					
------------------------	--	--	--	--	--

Comments: SHORTLY AFTER original installation PL load Breaker updated to 50 Amp #2 remained a 30 Amp Breaker

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Hour meters
 Pressure Gauges: N/A
 Other: N/A
 SCADA: MISSION
 Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A
 Heating Type: Elec Barrier Heaters
 Ventilation Type: N/A
 AC System Type: N/A
 Dehumidification: N/A
 Louvers: MOTOR in Generator Housing BAD
 Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	<u>Fair</u>	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	<u>Poor</u>

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

- Item/Recommendation
 1. Upgrade to 50 Amp Breaker
 2. _____
 3. _____
 4. _____
 5. _____

Estimated Capital Project Cost
 \$ 1000.
 \$
 \$
 \$
 \$
 \$
 \$
 \$
 \$
 \$

TOTAL \$

CATEGORY B ITEMS (Implement within 5 years)

- Item/Recommendation
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____

Estimated Capital Project Cost
 \$
 \$
 \$
 \$
 \$
 \$
 \$
 \$
 \$
 \$

TOTAL \$

CATEGORY C ITEMS (Implement between 6 and 10 years)

- Item/Recommendation
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Ruggles Pump Station
Address: _____

Inspection Date: 8-16-13
Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 1978-79 Year Facility Modified: _____
Facility Description: Wood structure Asphalt Shingles

PUMP STATION EQUIPMENT

Number of Pumps: 2
Pump #1:
Year Installed: 2012
Manufacturer: ABBA
Model and No.: 4X4X10 SC NSWV 300
Type: Centrifugal
NOM efficiency: _____
Design capacity/TDH: 300
Pump RPM: 1150
Valve size and type: 8" Knife Gate
Observed flow: _____
Observed TDH: _____

Service Area: NO
Motor #1:
Year Installed: 2012
Manufacturer: ABBA
Model and No.: 4X4X10 SC NSWV 300
Type: _____
Horsepower: 5 HP
Efficiency: _____
Inverter duty: _____
Variable/Constant: VFD
Vertical/Horizontal: Vertical
Motor RPM: 1150
Pump curve available: _____

Comments: _____

Pump #2:
Year Installed: SAME AS ABOVE
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #2:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: ~~2~~ New pumps and motors 2012

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available _____

Comments: _____

General Station Comments: *Roof just replaced in 2013
 needs exterior lights, wood shingles and trim with paint
 Replace doors or repaint*

Mercoid Level/Pump Controller installed 2013

Previous Pump Tests: _____

*Wood trim 75000 -
 Wood shingles 10000 -
 2-Exterior Doors 500 -
 exterior lights 500 -
 Generator 50000
 electrical 10000*

67000

OTHER PIPING AND VALVES

Air relief valves: _____
 Isolation valves: Repair - 6" Gate
 Piping: Re-painted where motors & pumps are.
 Comments: YRC check valve.

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mnfr: Superior 1978
 Model: 4SR/31
 Year Installed: 1978
 Rating: 45 KW
 Fuel Type: Diesel

Excellent	Good	<u>Fair</u>	<u>Poor</u>
Facility Load:			
Ample capacity (Y/N):			

Interior Lighting Type: Flourescent

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Lighting Level: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Exterior Lighting Type: Needs Replacing

Excellent	Good	Fair	<u>Poor</u>
-----------	------	------	-------------

Panel Boards: Sylvania

Excellent	Good	<u>Fair</u>	Poor
-----------	------	-------------	------

Motor Control Center: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Disconnect Switches: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Lightning Protection: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: Generator needs Replacement - Old

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	<u>missions</u>	Excellent	Good	Fair	Poor
SCADA:	<u>Mercoid Pump Controller</u>	Excellent	<u>Good</u>	Fair	Poor
Comments:	_____				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	_____	Fuel Storage Capacity: _____			
Heating Type:	<u>electric</u>	Excellent	Good	Fair	Poor
Ventilation Type:	_____	Excellent	Good	Fair	Poor
AC System Type:	<u>none</u>	Excellent	Good	Fair	Poor
Dehumidification:	_____	Excellent	<u>Good</u>	Fair	Poor
Louvers:	_____	Excellent	<u>Good</u>	Fair	Poor

Comments: only 1 heater works in Building
Influent valve to wetwell does not work

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
<u>1. Replace separator</u>	\$
<u>2. Re shingle (sides)</u>	\$
<u>3. TRIM</u>	\$
<u>4. Extend gutters to ground possible rain barrels</u>	\$
<u>5. Replace control panel due to age</u>	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$

Parts Quotation

ABBA

ABBA PUMP PARTS & SERVICE
www.abbaparts.com

Date: February 15, 2012
Quote Number: W-ACNA-19999-1
ABBA Job #
Customer Order#
Order Date:
Phone:
Fax:

Customer: WAREHAM WATER POLLUTION CONTROL FACILITY
Contact: Brian Miller
E-Mail: bmillier@wareham.ma.us
Reference:

Genuine ABBA Performance™ + Parts to Fit:

Make: Allis Chalmers Serial #/Year: 791-29935-1-1
Size/Model: 4x4x10SC NSWV 300 Power Frame #: F7-M1
Capacity: 300 GPM Rotation: *** When Viewed From Driver End
Head: 26 Feet Wear Rings Option***
Speed: 1150 RPM Stuffing Box Packed***
Imp Dia.: (8.63) Inches Motor: 5 HP: Frame:

*** Please Confirm When Placing Order

QTY	Part #/Name	Material	ABBA #	OEM #	Net Price (Each)
-----	-------------	----------	--------	-------	------------------

2 Complete ABBA replacement pump model ACN0442/F7M. Includes base, 4x4 suction elbow, suction cover, casing, impeller, shaft, sleeve, packing set, packing gland set, stuffing box cover, frame, bearing housing, bearings, lip seals, deflectors, steel adjusting shims, gaskets, high ring motor base, motor coupling, and miscellaneous items to complete the replacement pump. All components in standard materials and construction. Would be a drop in replacement. Does not include 5 hp motor.
TOTAL NET PRICE (EACH REPLACEMENT PUMP) \$9,022.00

OPTION FOR WEAR RINGS AND MECHANICAL SEAL (NET ADDER):

1 Wear ring (impeller) 410 St. St. \$ 322.00
1 Wear ring (suction cover) 410 St. St. \$ 297.00
1 Mechanical seal (double) \$ 320.00

P/O # 5092

Net deduct for motor coupling(-\$ 125.00)

+ Freight 400⁰⁰ for both \$9,822⁰⁰ each

Freight: Extra Shipment: 8 to 10 weeks
Taxes: Extra if Applicable Terms: Per APS-Schedule C - (see attached)
Price Valid For 30 Days FOB: Burlington, Ont., Canada
Payment Terms: Net 30 Days (O.A.C.). We also accept VISA (a 3% charge will be applied)

Quoted by: Trevor Allen

5370 Munro Court - Burlington, Ontario, Canada - L7L 5N8 - Tel: 905.333.2720 1.800.268.5142 Fax: 905.333.0973

Replacement pumps, parts, & assemblies for major brand pumps used in Municipal water and wastewater applications, particularly Allis Chalmers & Fairbanks Morse

American Wellwork • Aurora • Chicago • Clow/Yeomans • Cornell • Crane Deming • De Laval • Gorman Rupp • Goulds • Marlow • Mather & Pratt • Morris • Paco • Patterson • Smart Turner • Smith & Loveless • Wemco • Worthington (Flowsolve IDP)

NOTE: ALL OEM NAMES, NUMBERS, SYMBOLS & DESCRIPTIONS ARE FOR REFERENCE PURPOSES ONLY. IT IS NOT IMPLIED THAT ANY PART LISTED IS THE PRODUCT OF THE OEM.

ABBA PARTS & SERVICE IS NOT A DISTRIBUTOR OF, AGENT FOR, NOR AFFILIATED IN ANY WAY WITH A REFERENCED OEM.

\$ w/SS. wear rings \$ 9,841⁰⁰ delivered w-9

Parts Quotation

ABBA.

ABBA PUMP PARTS & SERVICE
www.abbaparts.com

Date: February 15, 2012
Quote Number: W-ACNP-19999-2
ABBA Job #
Customer Order#
Order Date:
Phone: -
Fax: -

Customer: WAREHAM WATER POLLUTION CONTROL FACILITY
Contact: Brian Miller
E-Mail: bmiller@wareham.ma.us
Reference:

Genuine ABBA Performance™ + Parts to Fit:

Make: Allis Chalmers Serial #/Year: 791-29935-1-1
Size/Model: 4x4x10SC NSWV 300 Power Frame #: F7-M1
Capacity: 300 GPM Rotation: When Viewed From Driver End
Head: 26 Feet Wear Rings
Speed: 1150 RPM Stuffing Box
Imp Dia.: (8.63) inches Motor: HP: 5 Frame:

*** Please Confirm When Placing Order

QTY	Part #/Name	Material	ABBA #	OEM #	Net Price (Each)
2	5 HP ELECTRIC MOTOR 1150 RPM, 230/460V/3/60				\$800.00

Used P/O # 509,

Freight: Extra Shipment: 8 to 10 weeks
Taxes: Extra if Applicable Terms: Per APS-Schedule C - (see attached)
Price Valid For 30 Days FOB: Burlington, Ont., Canada
Payment Terms: **Net 30 Days (O.A.C.). We also accept VISA (a 3% charge will be applied)**

Quoted by: Trevor Allen

5370 Munro Court - Burlington, Ontario, Canada - L7L 5N8 - Tel: 905.333.2720 1.800.268.5142 Fax: 905.333.0973

Replacement pumps, parts, & assemblies for major brand pumps used in Municipal water and waste-water applications, particularly
Allis Chalmers & Fairbanks Morse

American Wellwork • Aurora • Chicago • Clow/Yeomans • Cornell • Crane Deming • De Laval • Gorman Rupp • Goulds • Marlow • Mather & Pratt • Morris
• Paco • Patterson • Smart Turner • Smith & Loveless • Wemco • Worthington (Flowserve IDP)

NOTE: ALL OEM NAMES, NUMBERS, SYMBOLS & DESCRIPTIONS ARE FOR REFERENCE PURPOSES ONLY. IT IS NOT IMPLIED THAT ANY PART LISTED IS THE PRODUCT OF THE OEM.

ABBA PARTS & SERVICE IS NOT A DISTRIBUTOR OF, AGENT FOR, NOR AFFILIATED IN ANY WAY WITH A REFERENCED OEM.

PUMP STATION CONDITION ASSESSMENT

Pump Station: Saltworks Rd
 Address: SALTWORKS RD
BUZZARDS BAY AV

Inspection Date: 7-3-13
 Inspected By: RM

GENERAL INFORMATION

Year Facility Constructed: _____ Year Facility Modified: _____
 Facility Description: CONCRETE BLOCK w/ ASPHALT Roof, ^{BRICK} Siding Dry elec room
concrete wet well

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: N
 Pump #1: _____ Motor #1: _____
 Year Installed: 1990 Year Installed: _____
 Manufacturer: FLYST Manufacturer: _____
 Model and No.: CP 3127 S/N 180.9020694 Model and No.: _____
 Type: Submersible Type: _____
 NOM efficiency: _____ Horsepower: 7.5
 Design capacity/TDH: _____ Efficiency: _____
 Pump RPM: _____ Inverter duty: _____
 Valve size and type: _____ Variable/Constant: CONST
 Observed flow: _____ Vertical/Horizontal: Vert
 Observed TDH: _____ Motor RPM: _____
 Comments: Impeller code 433 Pump curve available: original should be rebuilt or replaced

Pump #2: _____ Motor #2: _____
 Year Installed: 1990 Year Installed: _____
 Manufacturer: FLYST Manufacturer: _____
 Model and No.: 3127 S/N 180.9020693 Model and No.: _____
 Type: Submersible Type: _____
 NOM efficiency: _____ Horsepower: _____
 Design capacity/TDH: _____ Efficiency: _____
 Pump RPM: _____ Inverter duty: _____
 Valve size and type: _____ Variable/Constant: _____
 Observed flow: _____ Vertical/Horizontal: _____
 Observed TDH: _____ Motor RPM: _____
 Comments: P2 Pump curve available: _____
Rebuilt by ITC Flyst Corp 5/19/03 @ 3403.87 hours, new cable wear
Rins + BASIC Ream kit

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available _____

Comments: _____

General Station Comments: DOORS + TRIM NEED PAINT. History of
Recesses in Ceiling, Ceiling tiles missing

Previous Pump Tests: _____

1 Pump - 5000
 Roof - 5000
 WW ventilation 2000
 Ass. wood shingles 2000
 Level sensor 5000
19000
 generator - 50000
total 69000

OTHER PIPING AND VALVES

Air relief valves:	_____	Excellent	Good	Fair	Poor
Isolation valves:	FROZEN - need to be freed up	Excellent	Good	Fair	Poor
Piping:	4" _____	Excellent	Good	Fair	Poor

Comments: in Man hole (2) 4" check valves + (2) 4" gate valves to isolate
F/m. Manhole should be pumped out (sump pump) valves lubed + exercised 1/4/10

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: Superior
 Model: 40R163
 Year Installed: 1990
 Rating: 30KW
 Fuel Type: Diesel

Excellent	Good	Fair	Poor
-----------	------	------	------

Facility Load:
 Ample capacity (Y/N):

Interior Lighting Type: Fluorescent

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: wetwell lighting good, wetwell exhaust fan N/G
 wetwell ELEC situation Box needs paint

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:

Flow meters only

Excellent Good Fair Poor

Pressure Gauges:

Excellent Good Fair Poor

Other:

Excellent Good Fair Poor

SCADA:

MISSION

Excellent Good Fair Poor

Comments:

MECHANICAL SYSTEMS INSPECTION

Fuel Source:

N/A

Fuel Storage Capacity:

Heating Type:

ERC wall mount

Excellent Good Fair Poor

Ventilation Type:

Wetwell DUCT
WORK, Fan N/G

Excellent Good Fair Poor

AC System Type:

N/A

Excellent Good Fair Poor

Dehumidification:

N/A

Excellent Good Fair Poor

Louvers:

Excellent Good Fair Poor

Comments:

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation

1. Wetwell exhaust fan
2. _____
3. _____
4. _____
5. _____

Estimated Capital Project Cost

\$ 2000

\$
\$
\$
\$
\$
\$

TOTAL \$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation

1. Rebuild Panel 1
2. _____
3. _____
4. _____
5. _____

Estimated Capital Project Cost

\$ 3000

\$
\$
\$
\$
\$
\$

TOTAL \$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation

1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Smith
 Address: _____

Inspection Date: 8-17-13
 Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 1978-79 Year Facility Modified: _____
 Facility Description: Waxed Shingle Building

PUMP STATION EQUIPMENT

Number of Pumps: <u>2</u>	Service Area: <u>No</u>
Pump #1:	Motor #1:
Year Installed: <u>1978 Rebuilt 2006</u>	Year Installed: <u>1978 Rebuilt 2006</u>
Manufacturer: <u>Worthington Pump</u>	Manufacturer: <u>Reliance</u>
Model and No.: <u>4MF-75</u>	Model and No.: <u>1MA483667-G1-Y</u>
Type: <u>Centrifugal Pump</u>	Type: <u>PM</u>
NOM efficiency: _____	Horsepower: <u>50/28.10</u>
Design capacity/TDH: <u>1200 GPM @ 75' TDH</u>	Efficiency: _____
Pump RPM: <u>1200</u>	Inverter duty: _____
Valve size and type: <u>8" Gate / 8" Check valve</u>	Variable/Constant: <u>VFD</u>
Observed flow: _____	Vertical/Horizontal: <u>VERTICAL</u>
Observed TDH: _____	Motor RPM: <u>1190 / 895</u>
	Pump curve available: _____

Comments: Rebuilt by Delta Electric 2006 (motors 1+2)

Pump #2:	Motor #2:
Year Installed: <u>SAME AS ABOVE</u>	Year Installed: <u>SAME AS ABOVE</u>
Manufacturer: _____	Manufacturer: _____
Model and No.: _____	Model and No.: _____
Type: _____	Type: _____
NOM efficiency: _____	Horsepower: _____
Design capacity/TDH: _____	Efficiency: _____
Pump RPM: _____	Inverter duty: _____
Valve size and type: _____	Variable/Constant: _____
Observed flow: _____	Vertical/Horizontal: _____
Observed TDH: _____	Motor RPM: _____
	Pump curve available: _____

Comments: _____

*Ventilation - Does NOT work - Dry & wet side
 Wear Rings on Volute - may want to replace both pumps
 Needs new Level indicator*

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

General Station Comments: Pumps, motors, and piping need to be scrapped and repainted.
Replace trim + wood shingles (siding)
outside lighting fix or replace
Doors - Paint

Previous Pump Tests: _____

Generator 50000 -
 Wood trim + wood shingles 5000 -
 Electrical 10000 -
 Doors 2000 -
 Windows 1000 -
 Heaters 3000 -
 70000

OTHER PIPING AND VALVES

2 - 8" Check valves
 Sluice Gates - Do not work (wet well side)

Air relief valves: _____
 Isolation valves: Need paint 8" Gate valve
8" 8" check valve
 Piping: needs Re painting
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: Generator old - hard to
get replacement parts if at all.

Standby Generator: Mnfr: Superior
 Model: 100R131
 Year Installed: 1978-79
 Rating: 100 KW
 Fuel Type: Diesel

Excellent	Good	Fair	Poor
-----------	------	------	------

Facility Load:
 Ample capacity (Y/N): Bugs Down when pump turns
ON.

Interior Lighting Type: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: Needs repair or replacement

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: Original 1978

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: Original 1978

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: Generator is in need of replacement

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	_____	Excellent	Good	Fair	Poor
SCADA:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	_____	Fuel Storage Capacity: _____			
Heating Type:	_____	Excellent	Good	Fair	Poor
Ventilation Type:	Does not work - Pump side (Dry) and wet side	Excellent	Good	Fair	Poor
AC System Type:	N/A	Excellent	Good	Fair	Poor
Dehumidification:	Does not work	Excellent	Good	Fair	Poor
Louvers:	Need new motor for ventilation	Excellent	Good	Fair	Poor
Comments:	_____				

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. Generator - Mercoid Pump Controller	\$
2. Ventilation	\$
3. Wood shingles + trim	\$
4. outside lighting	\$
5. Painting of pumps, motor, pipes	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1.	\$
2.	\$
3.	\$
4.	\$
5.	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1.
2.
3.
4.
5.

Delta Electric Motor & Generator Co Inc

379 Alden Road
Fairhaven, Ma 02719

Phone 508 997-0582 FAX 508 997-0980

Invoice #: 259159
Date: 12/21/2005
PO #: 2279

Reference #:
Due Date: 1/20/2006
Job #: 51459

Invoice

Terms: 2% 10 NET 30
Discount Date: 12/31/2005

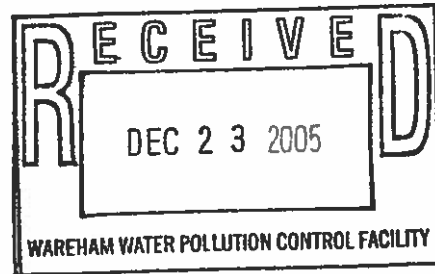
BILL TO:

WAREHAM WATER POLLUTION CONTROL 1499
6 TONY'S LANE
WAREHAM, MA 02571 USA

Make:RELIANCE Item:VERTICAL MOTOR Model:1MA483667-G1-YD HP:50/28.10 Type:PM Frame:445TSC Volts:460 RPM:1190/895
Encl:DP Cycles:60 Ph:3 Amps/67.2/47/

Quantity	Description	Disc.	Unit Price	Extended
	DISASSEMBLE, CLEAN & INSPECT ALL MACHINE FITS PERFORM CORE LOSS TEST, REWIND STATOR DIP & BAKE FURNISH & INSTALL BEARINGS ASSEMBLE LOAD TEST & PAINT RUSH REPAIR			
1	REWIND & RECONDITION		\$3,586.00	\$3,586.00
			Total	\$3,586.00

Smith Ave - Pump #1



Service Charge: 1.5% Per Month, 18 % Per Annum on Balance

379 Alden Road
Fairhaven, Ma 02719

Phone 508 997-0582 FAX 508 997-0980

Date: 1/4/2006
PO #: 2298

Reference #:
Due Date: 2/3/2006
Job #: 51476

Invoice

Terms: 2% 10 NET 30
Discount Date: 1/14/2006

BILL TO:

WAREHAM WATER POLLUTION CONTROL 1499
6 TONY'S LANE
WAREHAM, MA 02571 USA

24-17

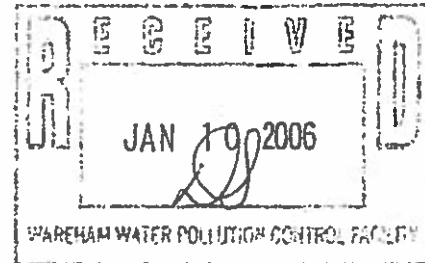
Make: RELIANCE Item: MOTOR Model: 1MA83668-G1-YD HP: 50 Type: P Frame: 405TSC Volts: 460 RPM: 1185 Encl: DP Cycles: 60 Ph: 3
Amps: 62.4/

Quantity	Description	Disc.	Unit Price	Extended
	TEST DISASSEMBLE CLEAN & INSPECT ALL MACHINE FITS STEAM CLEAN & BAKE ALL COMPONENTS PERFORM CORE LOSS TEST REWIND, DIP, BAKE & POOR EPOXY STATOR CHECK ROTOR VIBRATION LEVEL DYNAMICALLY BALANCE ROTOR ASSEMBLY METALIZE & MACHINE BEARING HOUSING(S) FURNISH & INSTALL REPLACEMENT BEARINGS ASSEMBLE TEST & PAINT			
1	TOTAL REPAIRS AS STATED ABOVE		\$2,978.30	\$2,978.30

Total **\$2,978.30**

Smith Ave

Pump #2, Smith Ave



Service Charge: 1.5% Per Month, 18 % Per Annum on Balance

PUMP STATION CONDITION ASSESSMENT

Pump Station: South Blvd
 Address: S. BLVD
ONSSET MA

Inspection Date: 8-13-13
 Inspected By: P. Miller

GENERAL INFORMATION

Year Facility Constructed: 1972 Year Facility Modified: _____
 Facility Description: CONCRETE BUNKER, STEEL TUBE/VESSEL
METAL HATCH COVER

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: Y

Pump #1:
 Year Installed: 1972
 Manufacturer: SHONE/YEOMANS
 Model and No.: S/O# 62020
 Type: PNEUMATIC EJECTOR
 NOM efficiency: _____
 Design capacity/TDH: 20' TDH 100 gpm
 Pump RPM: _____
 Valve size and type: Fairbanks 5" check + Flapper
 Observed flow: _____
 Observed TDH: 20' TDH

Motor #1:
 Year Installed: 1972
 Manufacturer: BALDOR
 Model and No.: CAT # 36801-107
 Type: FIEC
 Horsepower: 5
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: CONST
 Vertical/Horizontal: HOR
 Motor RPM: 1150
 Pump curve available: _____

Comments: Paint Kettles, wear items in pumps have been replaced
As needed

Pump #2:
 Year Installed: SAME ↑ ~~2010~~
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #2:
 Year Installed: APROX ~~2010~~ 2004
 Manufacturer: BALDOR
 Model and No.: CAT # EM3611T
 Type: FIEC
 Horsepower: 5
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: CONST
 Vertical/Horizontal: HOR
 Motor RPM: 1150
 Pump curve available: _____

Comments: PUMPS HAVE HAD ALL wear items
replaced As needed throughout the years.

Compressor #1

Pump #3: 1972
Year Installed: 1972
Manufacturer: QUINCY
Model and No.: 240-103
Type:
NOM efficiency:
Design capacity/TDH:
Pump RPM:
Valve size and type:
Observed flow:
Observed TDH:

Motor #3:
Year Installed:
Manufacturer:
Model and No.:
Type:
Horsepower:
Efficiency:
Inverter duty:
Variable/Constant:
Vertical/Horizontal:
Motor RPM:
Pump curve available:

Comments: 0-17 psi 1'57" 3/1972

Compressor SHOULD Be Rebuilt

Compressor #2

Pump #4:
Year Installed: 2011
Manufacturer: QUINCY
Model and No.: 240-104
Type:
NOM efficiency:
Design capacity/TDH:
Pump RPM:
Valve size and type:
Observed flow:
Observed TDH:

Motor #4:
Year Installed:
Manufacturer:
Model and No.:
Type:
Horsepower:
Efficiency:
Inverter duty:
Variable/Constant:
Vertical/Horizontal:
Motor RPM:
Pump curve available

Comments: 0-17 psi 1'45" 3/1972

General Station Comments:

Hatch Doors in poor condition,

PAINT Interior Sewer Pipes + especially near where pipes go through WALLS, Consider caulk where pipe meets concrete.

Hatch - 5000
Insulation on walls - 10000
electrical - 10000
PAINT one up - 5000
30000

Previous Pump Tests:

OTHER PIPING AND VALVES

Fair-banks VALVES

- (2) 5" CHECK VALVES
- (2) 5" FLAPPER VALVES
- (4) 5" gate VALVES

Air relief valves: _____
 Isolation valves: _____
 Piping: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Comments: PAINT PIPING + VESSEL

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mnfr: _____
 Model: _____
 Year Installed: N/A
 Rating: _____
 Fuel Type: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: INCANDESCENT

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: P/S Shager a compressor for use when utility power fails - SEE FAST PLVD COMMENTS

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: N/A

Pressure Gauges: Replace Mercoid
mercury switches

Other: _____

SCADA: MISSION

Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A

Heating Type: ELEC WAU Heater N/G
compressors Heat P/S

Ventilation Type: DUCT WORK
NO FAN

AC System Type: N/A

Dehumidification: N/A

Louvers: N/A

Comments: _____

Fuel Storage Capacity: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. <u>Replace Portable B/U Compressor</u>	\$ <u>10,000.00</u>
2. <u>1) or INSTAL TRANSFER SWITCH for</u>	\$
3. <u>B/U utility power ?</u>	\$
4. _____	\$
5. <u>2) Replace Hatch cover</u>	\$ <u>2000.00</u>
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station:

S. WATER ST

Address:

S. WATER ST
UNSET MA

43 yw

Inspection Date:

8-15-13

Inspected By:

R. W.

GENERAL INFORMATION

Year Facility Constructed:

1971

Year Facility Modified:

Facility Description:

Brick + Concrete, Flat Roof, 2 level wet well 2 level pump + ELECTRICAL

PUMP STATION EQUIPMENT

Number of Pumps:

2

Service Area:

yes

Pump #1:

Year Installed:

1971

Manufacturer:

FAIRBANKS MORSE

Model and No.:

Type:

SEE ATTACHED

NOM efficiency:

Design capacity/TDH:

Pump RPM:

Valve size and type:

8" CHECK MHV + F CO

Observed flow:

Observed TDH:

Comments:

PA rebuilt 5/08

etc Pump + MOTOR sound

Motor #1:

Year Installed:

1971

Manufacturer:

AC INDUCTION MOTOR

Model and No.:

Type:

SEE ATTACHED

Horsepower:

Efficiency:

Inverter duty:

Variable/Constant:

Vertical/Horizontal:

Motor RPM:

Pump curve available:

New impeller, shaft, bearings

2 speed motor

Pump #2:

Year Installed:

SAME ↑

Manufacturer:

Model and No.:

SEE ATTACHED

Type:

NOM efficiency:

Design capacity/TDH:

Pump RPM:

Valve size and type:

Observed flow:

Observed TDH:

Comments:

pump #2 older but has less use than #1 which was the 2 speed + lean pump for Decades

Motor #2:

Year Installed:

SAME ↑

Manufacturer:

Model and No.:

SEE ATTACHED

Type:

Horsepower:

Efficiency:

Inverter duty:

Variable/Constant:

Vertical/Horizontal:

Motor RPM:

Pump curve available:

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

General Station Comments:

Roofs old probably should consider
 replacing 5-10 years. EXTERIOR DOORS need
 replacing.
 PAINT ALL PIPING

Previous Pump Tests:

Interior Lighting - 1000
 Roof - 5000
 TRM - 2000
 wood singlet Headers - 2000
 exterior doors - 2000
 2 pumps 30000
 Generator 50000
 electrical panels
 VFD - 20000

OTHER PIPING AND VALVES

(5) 8" MHV + F CO gate/knife valves
 (1) 4" " " " " "

100000 =
 110000

Air relief valves:	<u>N/A</u>	Excellent	Good	Fair	Poor
Isolation valves:	<u>Frozen</u>	Excellent	Good	Fair	<u>Poor</u>
Piping:		Excellent	<u>Good</u>	Fair	Poor
Comments:	<u>Piping should be painted</u>				

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: Near salt water
SALT AIR HAS CAUSED PIPE CORROSION
problems

Standby Generator:	Mnfr:	Excellent	Good	Fair	<u>Poor</u>
	Model:				
	Year Installed:				
	Rating:				
	Fuel Type:				
	Facility Load:				
	Ample capacity (Y/N):				

Interior Lighting Type:	<u>Flourescet</u> <u>Incandescent</u>	Excellent	Good	<u>Fair</u>	Poor
-------------------------	--	-----------	------	-------------	------

Lighting Level:		Excellent	Good	<u>Fair</u>	Poor
-----------------	--	-----------	------	-------------	------

Exterior Lighting Type:	<u>INCANDESCENT</u>	Excellent	Good	Fair	<u>Poor</u>
-------------------------	---------------------	-----------	------	------	-------------

Panel Boards:	<u>MCP</u>	Excellent	Good	Fair	<u>Poor</u>
---------------	------------	-----------	------	------	-------------

Motor Control Center:		Excellent	Good	Fair	<u>Poor</u>
-----------------------	--	-----------	------	------	-------------

Disconnect Switches:		Excellent	Good	Fair	<u>Poor</u>
----------------------	--	-----------	------	------	-------------

Lightning Protection:		Excellent	Good	Fair	Poor
-----------------------	--	-----------	------	------	------

Fire Alarm System:	<u>N/A</u>	Excellent	Good	Fair	Poor
--------------------	------------	-----------	------	------	------

Security System:	<u>N/A</u>	Excellent	Good	Fair	Poor
------------------	------------	-----------	------	------	------

Potential Code Issues: _____

Comments: PS has the worst + most unreliable
Generator System.

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Fischer 1972
 Pressure Gauges: N/A
 Other: Level Control is Multitrade w/ MPT2C
 SCADA: _____
 Comments: MISSION

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A
 Heating Type: Elec wall Heaters
 Ventilation Type: Fan + Duct work NOT WORKING
 AC System Type: N/A
 Dehumidification: N/A
 Louvers: _____
 Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

ONE wall heater to be replaced.

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	TOTAL
1. <u>Replace Generator</u>	
2. _____	
3. _____	
4. _____	
5. _____	

Estimated Capital Project Cost
\$ <u>See ASNE PROPOSALS</u>
\$ _____
\$ _____
\$ _____
\$ _____
\$ _____
\$ _____

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	TOTAL
1. <u>Replace Roof</u>	
2. <u>Replace DOORS + Windows</u>	
3. _____	
4. _____	
5. _____	

Estimated Capital Project Cost
\$ <u>5000</u>
\$ <u>3000</u>
\$ _____
\$ _____
\$ _____
\$ _____
\$ _____

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Spring borne
Address: _____

Inspection Date: 8-17-13
Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: 1991
Facility Description: Concrete Building

Year Facility Modified: 2007 - 2012

PUMP STATION EQUIPMENT

Number of Pumps: 2
Pump #1: _____
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: 6" check valve
Observed flow: _____
Observed TDH: _____

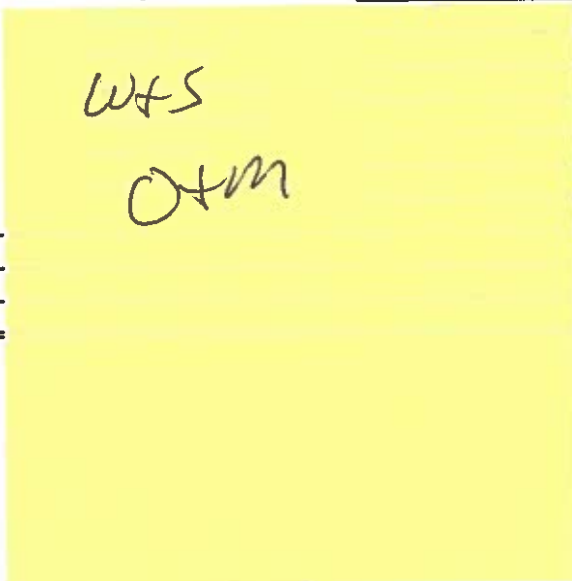
Service Area: _____
Motor #1: _____
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #2: _____
Year Installed: Same as Above
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #2: _____
Year Installed: Same as Above
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____

Comments: _____



Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available _____

Comments: _____

General Station Comments: *Building Good shape. maybe just paint.*

Previous Pump Tests: _____

PAINT
500

OTHER PIPING AND VALVES

Air relief valves: _____
 Isolation valves: 6" gate
 Piping: 6" to 8"
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: Kohler
 Model: 60R2G
 Year Installed: 2007
 Rating: 60KW
 Fuel Type: Propane

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Facility Load:
 Ample capacity (Y)

Interior Lighting Type: Fluorescent

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Lighting Level: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Exterior Lighting Type: Halogen

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Panel Boards: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Motor Control Center: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Disconnect Switches: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Lightning Protection: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Security System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Potential Code Issues: _____

Comments: _____

OTHER: _____

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Multi SMART
 Pressure Gauges: N/A
 Other: Multi SMART
 SCADA: Mission
 Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: _____
 Heating Type: _____
 Ventilation Type: _____
 AC System Type: _____
 Dehumidification: N/A
 Louvers: _____

Fuel Storage Capacity: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Comments: Station just up graded by Westport Sampson

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

PUMP STATION CONDITION ASSESSMENT

Pump Station: Terry Lane
 Address: _____

Inspection Date: 8-20-13
 Inspected By: Jim Walden

GENERAL INFORMATION

Year Facility Constructed: 1986 1992
 Facility Description: _____

Year Facility Modified: 2002 pumps rebuilt

PUMP STATION EQUIPMENT

Number of Pumps: 2

Service Area: _____

Pump #1:
 Year Installed: 1991 rebuilt 2002
 Manufacturer: Flygt
 Model and No.: 3127-180-9070186
 Type: Submersible
 NOM efficiency: _____
 Design capacity/TDH: 54'
 Pump RPM: 1750
 Valve size and type: 4" Check valve 4" Gate valve
 Observed flow: _____
 Observed TDH: _____

Motor #1:
 Year Installed: 1991 rebuilt 2002
 Manufacturer: Flygt
 Model and No.: 3127180-9070186
 Type: Submersible
 Horsepower: 7.5
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: Constant
 Vertical/Horizontal: _____
 Motor RPM: 1750
 Pump curve available: See Attached.

Comments: Pumps are old ~~that~~ should be replaced

Pump #2:
 Year Installed: Same as Above
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #2:
 Year Installed: Same as Above
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

New siding needed
New trim needed
ventilation on wet well side does not work.
Door needs paint

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: *Check valves / Gate & Piping should be painted -*

Previous Pump Tests: _____

*PAINT 2000 -
WW Ventilation 2000 -
4000 -*

OTHER PIPING AND VALVES

Air relief valves: _____
 Isolation valves: 4 GATE VALVE
 Piping: 4"
 Comments: Should Paint

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: Kohler
 Model: 40RO2J
 Year Installed: 1991
 Rating: 40 KW
 Fuel Type: Diesel

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

100 Gallon tank
 Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Lighting Level: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Exterior Lighting Type: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Panel Boards: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Motor Control Center: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Disconnect Switches: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

Lightning Protection: _____

Excellent	Good	Fair	Poor
Excellent	Good	<u>Fair</u>	Poor

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Security System: N/A

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

Potential Code Issues: _____

Comments: _____

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters:	_____	Excellent	Good	Fair	Poor
Pressure Gauges:	_____	Excellent	Good	Fair	Poor
Other:	MISSION	Excellent	Good	Fair	Poor
SCADA:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

MECHANICAL SYSTEMS INSPECTION

Fuel Source:	_____	Fuel Storage Capacity: _____			
Heating Type:	electric Heater wall mount	Excellent	Good	Fair	Poor
Ventilation Type:	looms wetwell DOES NOT WORK	Excellent	Good	Fair	Poor
AC System Type:	N/A	Excellent	Good	Fair	Poor
Dehumidification:	N/A	Excellent	Good	Fair	Poor
Louvers:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. Ventilation	\$
2. Siding	\$
3. TRIM - BRUSH ON SIDEWALK AREA	\$
4. Replace Pumps	\$
5. PAINT	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1.	\$
2.	\$
3.	\$
4.	\$
5.	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1.
2.
3.
4.
5.

FLYGT		SERIAL NO 3127.180-9070186		TEST CURVE NO 7943	CUSTOMER PINETREE ESTATES	
POWER HP 7.5	VOLTAGE 480	IMPELLER PART NO 430 11 00		IMPELLER CODE 483	FLYGT REF NO C-90031	
PHASES 3	RPM 1750	INPUT KW 6.7	SIZE 4	TA NUMBER	PLM NUMBER 980073	REFR PUMPING SYSTEMS INC.
DATE 12/18/80 11:18		TESTED BY G. PECUNIA		ACCEPTANCE CODE HI		

TEST DATA

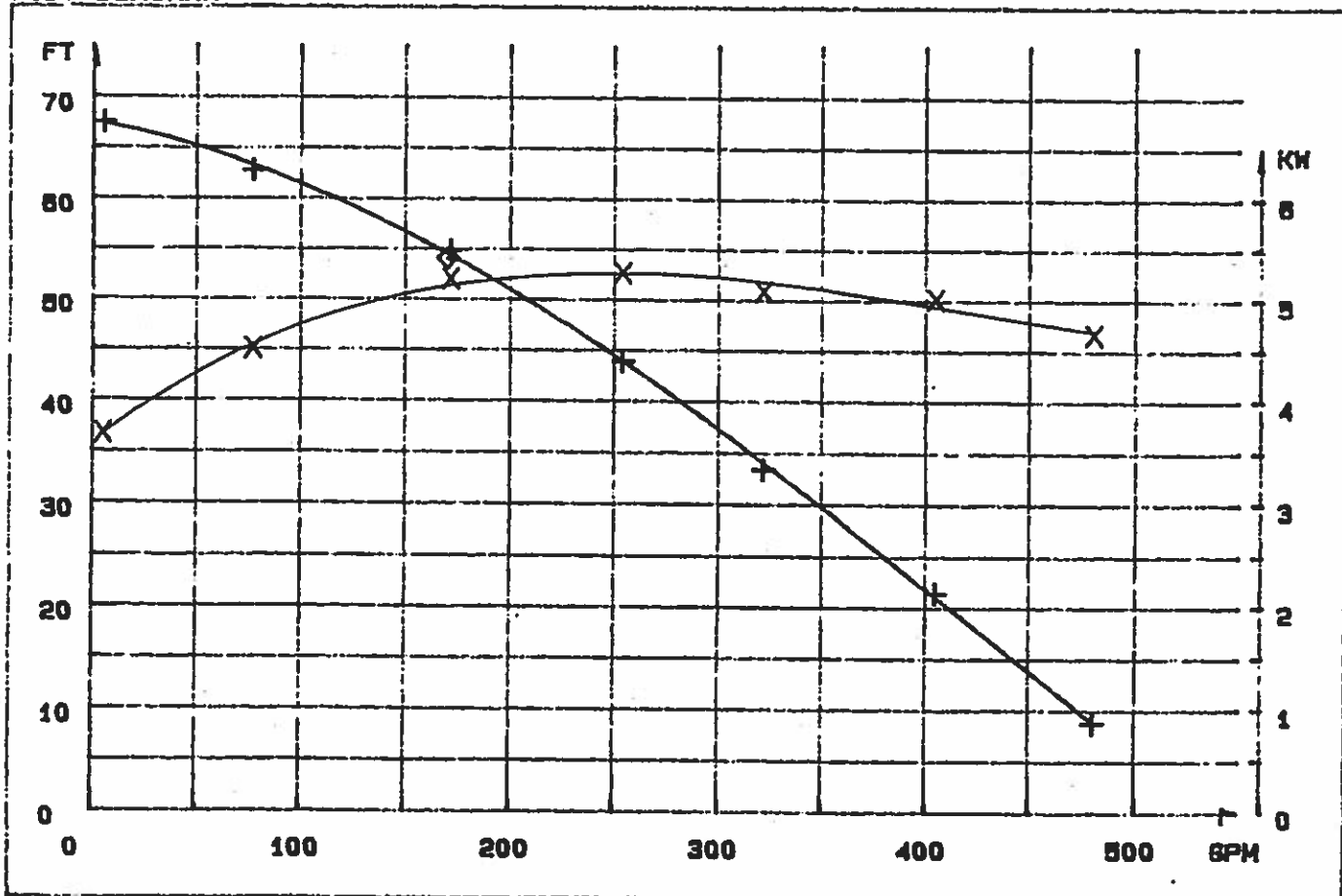
Q	GPM	H	FT	P	KW	VOLT	AMP
	4.8	67.8		3.67		481	8.28
	77.2	62.7		4.50		482	7.20
	171.5	54.8		5.19		482	8.07
	253.8	49.9		5.28		481	8.11
	321.9	39.4		5.08		482	7.88
	404.8	21.4		5.01		483	7.78
	480.3	8.7		4.88		482	7.34

DUTY POINTS

Q	GPM	H	FT
	189		54.0

CERTIFICATION : THIS TEST WAS CONDUCTED AT A FLYGT TEST FACILITY USING CLEAR WATER AT AMBIENT TEMP. (80-80F) . FLOW, HEAD AND POWER READINGS WERE TAKEN FROM ELECTRONIC METERING EQUIPMENT. ACCURACY OF THE TEST EQUIPMENT IS CONFIRMED BY PERIODIC CALIBRATIONS.

TEST DIAGRAM



MEASURED POINT ⊕ = Q/H DUTY POINT ◇ = Q/H
 ⊗ = Q/P □ = Q/P

PUMP STATION CONDITION ASSESSMENT

Pump Station: Thatcher Pump station
 Address: _____

Inspection Date: 9-1-13
 Inspected By: Jim Waldron

GENERAL INFORMATION

Year Facility Constructed: _____
 Facility Description: _____

Year Facility Modified: _____

PUMP STATION EQUIPMENT

Number of Pumps: 2
 Pump #1: _____
 Year Installed: 2012
 Manufacturer: FLYGT
 Model and No.: 3127.090
 Type: MT MT
 NOM efficiency: _____
 Design capacity/TDH: 30.80
 Pump RPM: 1740
 Valve size and type: 4" check
 Observed flow: _____
 Observed TDH: _____

Service Area: outside
 Motor #1: _____
 Year Installed: 2012
 Manufacturer: FLYGT
 Model and No.: 3127.090
 Type: MT
 Horsepower: 7.5
 Efficiency: 82.5%
 Inverter duty: _____
 Variable/Constant: constant
 Vertical/Horizontal: vertical
 Motor RPM: 1740
 Pump curve available: See attached.

Comments: _____

Pump #2: _____
 Year Installed: same as above
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #2: _____
 Year Installed: same as above
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #3:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
NOM efficiency: _____
Design capacity/TDH: _____
Pump RPM: _____
Valve size and type: _____
Observed flow: _____
Observed TDH: _____

Motor #4:
Year Installed: _____
Manufacturer: _____
Model and No.: _____
Type: _____
Horsepower: _____
Efficiency: _____
Inverter duty: _____
Variable/Constant: _____
Vertical/Horizontal: _____
Motor RPM: _____
Pump curve available: _____

Comments: _____

General Station Comments: *Trim fence line*
Paint GAS line going to generator
Paint electrical boxes (disconnect switch, meter, & generator)

Previous Pump Tests: _____

Paint 500

OTHER PIPING AND VALVES

Air relief valves:	_____	Excellent	Good	Fair	Poor
Isolation valves:	10" Gate Valve	Excellent	Good	Fair	Poor
Piping:	_____	Excellent	Good	Fair	Poor
Comments:	_____				

ELECTRICAL SYSTEMS INSPECTION

Location Classification:	Dry Location <input checked="" type="checkbox"/>
	Wet or Damp Location <input type="checkbox"/>
	Wet Corrosive Location <input type="checkbox"/>

Comments: _____

Standby Generator:	Mnfr: Generac
	Model: 97A-07469-S
	Year Installed: _____
	Rating: KW 45
	Fuel Type: Natural Gas

Excellent	Good	Fair	Poor
Facility Load: _____			
Ample capacity (Y/N): _____			

Interior Lighting Type: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lighting Level: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Exterior Lighting Type: 2 exterior lighting over wetwell

Excellent	Good	Fair	Poor
-----------	------	------	------

Panel Boards: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: N/A

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: _____

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: _____
 Pressure Gauges: _____
 Other: missings _____
 CADA: _____
 Comments: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: _____
 Heating Type: Small Heater Inside Panel _____
 Ventilation Type: _____
 AC System Type: N/A _____
 Dehumidification: N/A _____
 Louvers: _____
 Comments: _____

Fuel Storage Capacity: _____

Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	Good	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$ _____
2. _____	\$ _____
3. _____	\$ _____
4. _____	\$ _____
5. _____	\$ _____
TOTAL	\$ _____

CATEGORY B ITEMS (Implement within 5 years)

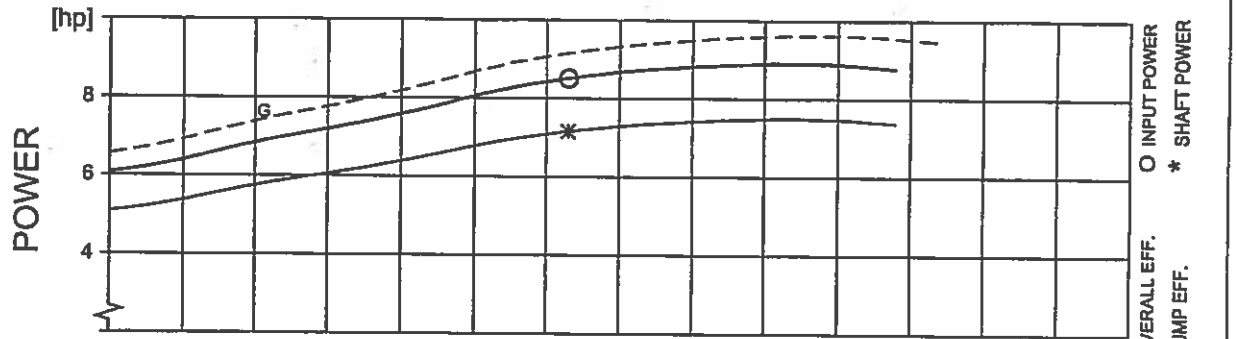
Item/Recommendation	Estimated Capital Project Cost
1. _____	\$ _____
2. _____	\$ _____
3. _____	\$ _____
4. _____	\$ _____
5. _____	\$ _____
TOTAL	\$ _____

CATEGORY C ITEMS (Implement between 6 and 10 years)

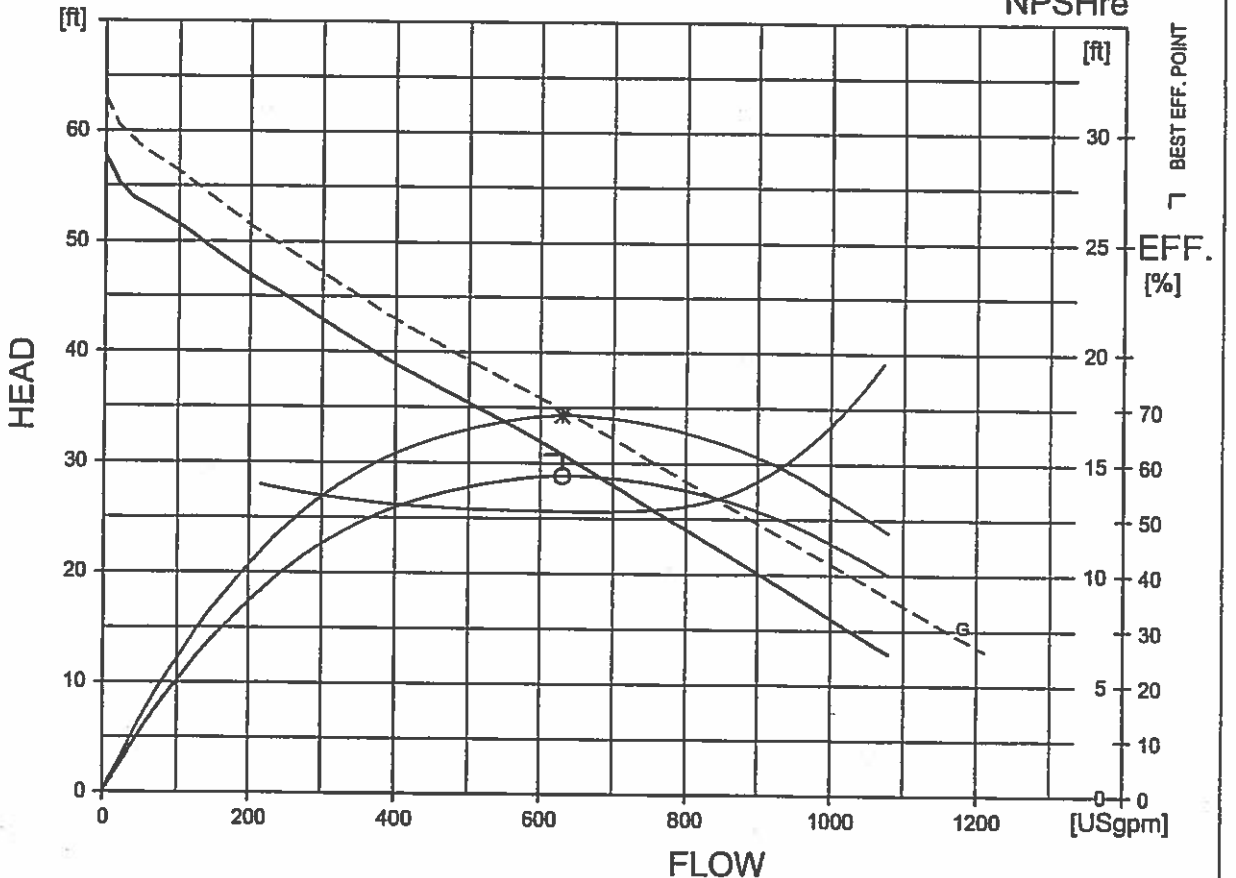
Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

Generic - Jim Wa 12-14-12

FLYGT		PERFORMANCE CURVE			PRODUCT NP3127.090	TYPE MT	
DATE 2012-12-14	PROJECT <i>Thatcher</i>				CURVE NO 63-439-00-2204	ISSUE 7	
POWER FACTOR	1/1-LOAD 0.88	3/4-LOAD 0.85	1/2-LOAD 0.78	RATED POWER	IMPELLER DIAMETER 188 mm		
EFFICIENCY	82.5 %	84.0 %	83.0 %	STARTING CURRENT ...	MOTOR #	STATOR	
MOTOR DATA	—	—	—	RATED CURRENT ...	21-10-4AL	28D	
COMMENTS	INLET/OUTLET			RATED SPEED	FREQ.	PHASES	REV
	- 4 inch			TOT.MOM.OF	60 Hz	3	12
	IMP. THROUGHLET			INERTIA ...	VOLTAGE	POLES	
	—			NO. OF	200 V	4	
				NO. OF	GEARTYPE		RATIO
				BLADES	—		—
				2			



DUTY-POINT	FLOW [USgpm]	HEAD [ft]	EFF. [%]	NPSH _{re} [ft]	GUARANTEE
B.E.P.	630	30.80	57.7 (68.6)	12.8	HI level A



FLYPS3.1.6.6 (20090313)

NPSH_{re} = NPSH_{3%} + min. operational margin
 Performance with clear water and ambient temp 40 °C

GUARANTEE BETWEEN LIMITS (G) ACC. TO
HI level A

PUMP STATION CONDITION ASSESSMENT

Pump Station: Woodbury
Address: WOODBURY
DUNSET MA

Inspection Date: 8-16-13
Inspected By: R. Miller

GENERAL INFORMATION

Year Facility Constructed: 1989 Year Facility Modified: _____
Facility Description: BLDG, w/ Asphalt roof shingles and Cedar shingles
CONCRETE VAULT w/ CONCRETE BLOCK ABOVE GROUND

PUMP STATION EQUIPMENT

Number of Pumps: 2 Service Area: NO

Pump #1: _____ Motor #1: _____
Year Installed: 1989 Year Installed: _____
Manufacturer: YOMANS Chicago Manufacturer: _____
Model and No.: S/O # 265-066 Model and No.: _____
Type: PNEMATIC Type: _____
NOM efficiency: _____ Horsepower: _____
Design capacity/TDH: 50gpm / 44' TDH Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: 4" FAIRBANKS FLAPPY+CHECK Variable/Constant: _____
Observed flow: _____ Vertical/Horizontal: _____
Observed TDH: _____ Motor RPM: _____
Pump curve available: _____

Comments: Pumps in good condition, wear items have been replaced as needed, Air supplied by Naumette

Pump #2: _____ Motor #2: _____
Year Installed: SAME ↑ Year Installed: _____
Manufacturer: _____ Manufacturer: _____
Model and No.: _____ Model and No.: _____
Type: _____ Type: _____
NOM efficiency: _____ Horsepower: _____
Design capacity/TDH: _____ Efficiency: _____
Pump RPM: _____ Inverter duty: _____
Valve size and type: _____ Variable/Constant: _____
Observed flow: _____ Vertical/Horizontal: _____
Observed TDH: _____ Motor RPM: _____
Pump curve available: _____

Comments: _____

Pump #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #3:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

Pump #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 NOM efficiency: _____
 Design capacity/TDH: _____
 Pump RPM: _____
 Valve size and type: _____
 Observed flow: _____
 Observed TDH: _____

Motor #4:
 Year Installed: _____
 Manufacturer: _____
 Model and No.: _____
 Type: _____
 Horsepower: _____
 Efficiency: _____
 Inverter duty: _____
 Variable/Constant: _____
 Vertical/Horizontal: _____
 Motor RPM: _____
 Pump curve available: _____

Comments: _____

General Station Comments: EXTERIOR SHOULD BE PAINTED + ROOF
SHINGLES REPLACED.
ALL WASTEWATER PIPING + PUMPS SHOULD
BE PAINTED AND CAULKED WHERE THEY MEET CONCRETE WALLS

Previous Pump Tests: _____

wood trim	2000 -	
Shingles	2000 -	
exterior door + paint	1000 -	5000 -

OTHER PIPING AND VALVES

AIR PIPING IN GOOD CONDITION
 (4) 4" Fairbanks gate VALVES

Air relief valves: _____
 Isolation valves: _____ *Interior Only* _____
 Piping: _____
 Comments: _____

Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location
 Wet or Damp Location
 Wet Corrosive Location

Comments: _____

Standby Generator: Mfr: _____
 Model: _____
 Year Installed: *N/A*
 Rating: _____
 Fuel Type: _____

Excellent	Good	Fair	Poor
-----------	------	------	------

Facility Load: _____
 Ample capacity (Y/N): _____

Interior Lighting Type: _____

Excellent	<u>Good</u>	Fair	Poor
-----------	-------------	------	------

Lighting Level: _____

Excellent	Good	Fair	<u>Poor</u>
-----------	------	------	-------------

Exterior Lighting Type: _____

Excellent	Good	<u>Fair</u>	Poor
-----------	------	-------------	------

Panel Boards: *N/A*

Excellent	Good	Fair	Poor
-----------	------	------	------

Motor Control Center: *N/A*

Excellent	Good	Fair	Poor
-----------	------	------	------

Disconnect Switches: *N/A*

Excellent	Good	Fair	Poor
-----------	------	------	------

Lightning Protection: *N/A*

Excellent	Good	Fair	Poor
-----------	------	------	------

Fire Alarm System: *N/A*

Excellent	Good	Fair	Poor
-----------	------	------	------

Security System: *N/A*

Excellent	Good	Fair	Poor
-----------	------	------	------

Potential Code Issues: _____

Comments: *SISTER STATION to Greene St*

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: N/A

Pressure Gauges: _____

Other: _____

SCADA: MISSION
ALARMS

Comments: _____

Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/A

Heating Type: E/OC W/WH HEATERS

Ventilation Type: FANS + DUCTWORK

AC System Type: N/A

Dehumidification: _____

Louvers: _____

Comments: _____

Fuel Storage Capacity: N/A

Excellent	Good	<u>Fair</u>	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	Good	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor
Excellent	<u>Good</u>	Fair	Poor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. _____	\$
2. _____	\$
3. _____	\$
4. _____	\$
5. _____	\$
TOTAL	\$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1. _____
2. _____
3. _____
4. _____
5. _____

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