



Byram Township Sanitary Sewer System

2015 Inspection Report on Operations and Maintenance

May 2015



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SECTION I

INTRODUCTION AND PURPOSE

I.1 Introduction

The Byram Township Sanitary Sewer System was put into operation in late 1996. The system collects and conveys wastewater from within the Township's designated sewer service area to the Musconetcong Sewerage Authority for treatment. The system generally consists of the following:

- **Collection/Conveyance System:** Approximately 8,500 feet of PVC gravity sewers, 55 manholes, 6,9500 feet of force main, two river crossings (one bridge crossing and one subsurface crossing), and various appurtenances such as valves, cleanouts, service connections, air vents, and air release valves.
- **Duplex Submersible Pump Stations:** Six wastewater pump stations consisting of wet well, valve vault, and other appurtenances identified as follows:

Pump Station No. 1 – Rt. 206 South @ Lubbers Run:

- Pump Type: Duplex non-clog submersible (10 hp)
- Pump Capacity: 179 gpm @ 85 TDH
- Wet Well Structure: 6 ft. dia. Concrete
- Wet Well Capacity: 669 gal. drawdown
- Trash Basket for Screening
- Level Controls: Level Sensing Probe with Float Backup System
- Meter/Valve Chamber w/shutoff valves and check valves
- Magnetic Flow Meter
- 40 Kw Generator w/ Automatic Transfer Switch
- 150 Amp Electric Service Board and Control Panel
- Alarm and Telephone Dialer System
- Hydrogen Sulfide mitigation (odor control) system

Pump Station No. 2 – Rt. 206 South near Lackawanna Drive:

- Pump Type: Duplex Non-Clog Submersible (7¹/₂ hp)
- Pump Capacity: 114 gpm @ 55 TDH

- Wet Well Structure: 8 Ft. Dia. Concrete
- Wet Well Capacity: 387 gal.
- Level Controls: Level Sensing Probe with Float Backup System
- Trash Basket for Screening
- Valve Vault
- 30 Kw Generator w/ Automatic Transfer Switch
- 150 Amp Electric Service Board and Control Panel
- Alarm and Telephone Dialer System
- Hydrogen Sulfide mitigation (odor control) system

Pump Station No. 3 – Municipal Complex behind Dog Pound:

- Pump Type: Duplex submersible grinder (6 hp)
- Pump Capacity: 61.8 gpm @ 65 TDH
- Wet Well Structure: 4 ft. dia. concrete
- Wet Well Capacity: 218 gal. drawdown
- Float Control System
- Trash Basket for Screening
- Valve Vault
- 25 Kw Generator w/ Automatic Transfer Switch
- 100 Amp Electric Service Board and Control Panel
- Alarm and Telephone Dialer System

Pump Station No. 4 – 55 Lackawanna Drive

- Pump Type: Duplex submersible grinder (1.9 hp)
- Pump Capacity: 35.6 gpm @ 45 TDH
- Wet Well Structure: 4 ft. dia. concrete
- Wet Well Capacity: 39 gal. drawdown
- Float Control System
- Trash Basket for Screening
- Valve Vault
- 100 Amp Electric Service Board and Control Panel
- Alarm and Telephone Dialer System

Pump Station No. 5 – Behind Byram Intermediate School

- Pump Type: Duplex submersible grinder (2.7 hp)
- Pump Capacity: 35 gpm @ 45 TDH
- Wet Well Structure: 4 ft. dia. concrete
- Wet Well Capacity: 70 gal. drawdown
- Float Control System
- Trash Basket for Screening
- Valve Vault
- 15 Kw Generator with Automatic Transfer Switch
- 100 Amp Electric Service Board and Control Panel
- Alarm and Telephone Dialer System

Pump Station No. 6 – Behind Byram Lakes School

- Pump Type: Duplex submersible grinder (1.9 hp)
- Pump Capacity: 38 gpm @ 50 TDH
- Wet Well Structure: 4 ft. dia. concrete
- Wet Well Capacity: 70 gal. drawdown
- Float Control System
- Trash Basket for Screening
- Valve Vault
- 100 Amp Electric Service Board and Control Panel
- Alarm and Telephone Dialer System

I.2 Purpose of this Report

Efficient collection systems operation requires good recordkeeping and planning, a competent workforce, and the purchasing of equipment appropriate to the system. These elements depend on system size, topography, complexity, age and anticipated growth.

Periodic oversight by a third party is critical to proper system management. This Report documents the results of a detailed inspection of the major system components and provides recommendations for proper operations, maintenance, and necessary upgrades.

I.3 System Operational Goals

Goals determine what courses of action are needed and help set an operating plan in motion. The goals of the Byram Township sewer utility are:

- Prevent public health hazards;
- Reduce inconvenience and damage by responsibly handling service interruptions;
- Protect municipal investment by increasing the useful life and capacities of the system and parts;
- Use operating funds efficiently;
- Convey wastewater with minimum inflow, infiltration, and exfiltration;
- Prevent excessive claims and legal fees related to backup by providing immediate, concerned, and efficient service to all emergency calls; and

- Perform all activities safely and avoid injury.

Principles to follow for achieving these goals and rules governing the use of collection systems include:

- Executing a basic routine preventive maintenance plan designed to prevent service interruption and protect capital investment;
- Immediately investigating all complaints and promptly correcting faulty conditions;
- Routinely inspecting for physical damage, repairing any damage, and eliminating the cause;
- Considering personnel safety in all operations;
- Performing periodic third party oversight;
- Recognizing public ownership and performing all functions courteously, efficiently, and professionally; and
- Implementing a community relations program to prevent abnormal and improper use.

1.4 Utility Organization

Sewer utilities are designed to perform and monitor operation and maintenance (O&M), administer budgeted monies, record and retain system information, and plan for future repairs and growth. They are also responsible for providing emergency service and public information.

In general, an organization's size depends on the size of the collection system. Determination of staff requirements for a collection system requires a working knowledge of the system, including variables such as:

- Level of service expected and funded;
- Miles of pipeline, subdivided into public and private sector systems;
- Age of the system;
- Construction materials used;
- Construction standards used;
- Agency responsibilities;

- Extent of Contractor use;
- Equipment types;
- Work site accessibility;
- Travel distance;
- System area topography;
- Collection systems service contract obligations; and
- Customer classes and nature of industries.

No single formula can be used to determine the staffing needs of a particular system. The number and type of operating personnel vary by agency and change with job assignments, responsibilities, and number of satellite yards or maintenance districts.

The function of the collection system is to collect, contain, and convey wastewater to a point of treatment. Ideally, a collection system keeps wastewater in and surface water and groundwater out, providing an uninterrupted flow. Staff requirements can be substantially affected by a routine preventive maintenance program; conversely, time spent on preventive maintenance reduces time spent on emergency situations that can drain financial resources.

All utility personnel are most effective when they clearly understand their responsibilities. Understanding standard position descriptions and task instructions contribute to this goal.

Administrative Staff: Administration management positions generally include a manager, superintendent, and, in large agencies, a director or executive director. Individuals in these positions typically are responsible for deciding and enforcing basic policy, planning system operations, preparing budgets and analysis, and representing the agency in the city government.

Field or staff supervisors are responsible for staff decisions and policies such as implementation of O&M rules and guidelines, maintenance expenditures, emergency actions, personnel actions, and enforcement of safety procedures.

Licensed Operator: Per NJDEP regulations, each collection system must have a designated licensed operator who assumes all responsibility for the system. The regulations specify a license level (C-1 through C-4) and an associated amount of time spent monitoring system operation based upon the size of the system. A C-1 license is required to operate the Byram Sanitary Sewer System.

Maintenance Staff: Activities of the maintenance staff are key in the preventive maintenance program. Observations during regular cleaning operations generate records of problem areas so that they can be repaired or serviced. The regular maintenance crew spots problems before they become serious and helps manage problems that arise in the field. Minor collection system repairs, including manhole repairs and small scale excavations to repair or replace broken pipes, can be made by the regular maintenance crew or by a separate repair crew. The Operations Staff does general, daily maintenance. Any specialized maintenance, such as pump or valve rebuilds, control repairs, or emergency generator maintenance must be done by outside contractors.

Emergency Services: Emergency crews are often the most difficult to organize because their tasks are varied and unpredictable. Problems range from a minor complaint to serious flooding, collapsed or obstructed sewers, pumping station failure, or rescue operations. Emergency crews are most effectively led by a person who favorably represents the workers and the agency to the public and has received specialized training in these aspects of the collection system.

In smaller communities like Byram Township, members of the regular maintenance crew who have received special training may constitute the emergency crew. They may work in conjunction with a pre-qualified list of Contractors depending upon the type of work needed to resolve the problem. It is important for the sewer utility to have annual contracts with qualified contractors so that it has a competitive price structure from which to authorize access 24 hour emergency responses. Examples of these services include, but are not limited to: bypass pumping; wastewater hauling; sewer cleaning; pump troubleshooting; and equipment replacement.

Since sewer overflows are a fineable offense under NJDEP regulations, all emergencies involving pumping stations are handled by specialized outside Contractors who can respond and rectify the situation in a timely manner.

Special emergency procedures should be established to give guidance to those who might suddenly find themselves involved at whatever hour with an emergency. These procedures define the circumstances under which other public agencies are notified including the NJDEP hotline, how flooding situations are handled, and methods for reconstruction.

Repair Crews: Repair functions and maintenance functions for many small agencies can be interrelated using the same personnel for a variety of field repairs, or if the workload is significant, separate crews can be established. In the event that this type of work is specialized and/or requires specialized equipment, as is often the case with sewer work, repairs must be performed by outside contractors.

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SECTION II

PHYSICAL INSPECTION OF THE SYSTEM

A physical inspection of the system was performed on December 16, 2014. The results of that inspection are as follows:

Pump Station No. 1 - Rt. 206 South @ Lubbers Run:

- The station incorporates both a primary level sensing probe (Multitrode) and backup float system for pump control and alarm condition sensing. Both system were tested and were functioning.
- The emergency generator and automatic transfer switch were tested and were functioning. The unit has over 1,000 hours. See Section III of this report for recommendations on future maintenance.
- The alarm dialer was tested and was functioning at the time of the inspection.
- The concrete wet well, previously noted as being severely deteriorated due to Hydrogen Sulfide gas, was rehabilitated in 2013.
- A hydrogen sulfide mitigation system was installed in 2014 and was functioning at the time of the inspection. The carbon was replaced in May 2015.
- The control and electrical panels have been covered with a wood frame roofing structure. Both panels are in acceptable condition.
- Check valves were replaced in 2011. During testing, it was noted that one of the check valves did not fully open. The check valves should be evaluated and serviced.
- Overall the station was clean and well maintained. Access and gate changes done during Rt. 206 Widening project were noted. The wetwell was last cleaned on 10/7/14.

Pump Station No. 2 - Rt. 206 South near Lackawanna Drive:

- The station incorporates both a primary level sensing probe (Multitrode) and backup float system for pump control and alarm condition sensing. Both system were tested and were functioning.
- The emergency generator and automatic transfer switch were tested and were functioning.

The unit has over 1,000 hours. See Section III of this report for recommendations on future maintenance.

- The alarm dialer was tested and was functioning at the time of the inspection.
- The concrete wet well, previously noted as being severely deteriorated due to Hydrogen Sulfide gas, was rehabilitated in 2013.
- A hydrogen sulfide mitigation system was installed in 2014 and was functioning at the time of the inspection. The carbon was replaced in May 2015.
- Fats, Oils and Grease (F.O.G.) that are generated by the system users continue to cause problems at this Pumping Station. The closing of the adjacent restaurant has apparently improved the situation somewhat. The operator currently utilizes a natural, citrus based product for FOG reduction.
- The control and electrical panels have been covered with a wood frame roofing structure. Both panels are in acceptable condition.
- Check valves were replaced in 2011. Check valves should be evaluated and serviced.
- Overall the station was clean and well maintained. The wetwell was last cleaned on 10/7/14.

Pump Station No. 3 – Municipal Complex behind Dog Pound:

The station incorporates a float system for pump control and alarm condition sensing. The float system was tested and was functioning.

- The emergency generator and automatic transfer switch were tested and were functioning. The unit has over 1,000 hours. See Section III of this report for recommendations on future maintenance.
- The alarm dialer was tested and was functioning at the time of the inspection.
- The two (2) pumps have continued to experience problems and are in need of attention. A bearing noise was noted during testing which generally indicates that failure is imminent.
- The guide wires that allow for removal of the pumps from above have deteriorated and are no longer useable. At this time, maintenance personnel would need to enter the wetwell (confined space) in order to remove the pumps for maintenance.
- Odors have historically been reported in the area, however no odor was apparent during the inspection.

- The control and electrical panels have been covered with a wood frame roofing structure. Both panels are in acceptable condition.
- Concrete pad for the electric panel is badly deteriorated.
- Check valves are original and are in need of service.
- Exterior exposed metal shows signs of deterioration.
- The station was generally well maintained. Some salvaged materials are currently stored within the fenced area that should be removed. The wetwell was last cleaned on 10/21/14.

Pump Station No. 4 - 55 Lackawanna Drive:

- The station incorporates a float system for pump control and alarm condition sensing. The float system was tested and was functioning.
- The station has no emergency generator, since the facility it serves is not on emergency power. Should future uses of the facility incorporate emergency power, then the station will need to either be connected to the facility power or be provided with an emergency generator.
- The alarm dialer was tested and was functioning at the time of the inspection.
- Check valves are original, and although they appear to be in good shape based on the limited use of the station, they should be evaluated and serviced, as necessary.
- Exterior exposed metal shows signs of deterioration.
- Overall the station was clean and well maintained. The wetwell was last cleaned on 10/21/14.

Pump Station No. 5 - Behind Byram Intermediate School:

- The station incorporates a float system for pump control and alarm condition sensing. The float system was tested and was functioning.
- The emergency generator and automatic transfer switch were tested and were functioning. The unit has over 1,000 hours. See Section III of this report for recommendations on future maintenance.
- At the time of the inspection, the licensed operator reported possible pump capacity issues (i.e. recent high levels issues in wetwell). Pump testing revealed possible pump performance issues. Overtemp alarm on pump #1 was noted. Pump #2 had significant bearing noise. Both pumps, starters and overloads were replaced on 4/23/15.
- The guide wires that allow for removal of the pumps from above have deteriorated and are no

longer useable. At this time, maintenance personnel would need to enter the wetwell (confined space) in order to remove the pumps for maintenance.

- The alarm dialer was tested and was functioning at the time of the inspection.
- The concrete pad for the power and control panels is deteriorated.
- Exterior exposed metal shows signs of deterioration.
- The perimeter fencing is in need of repair due to age and damage from plowing of the surrounding parking areas.
- Check valves are original and are in need of service.
- This station does not have adequate lighting.
- Overall the station was clean and well maintained. The wetwell was last cleaned on 10/7/14.

Pump Station No. 6 - Behind Byram Lakes School:

This station was built in around 2007 as part of the new school construction.

- The station incorporates a float system for pump control and alarm condition sensing. The float system was tested and was functioning.
- The station does not have a dedicated emergency generator. It is powered from the School which has an emergency generator.
- The alarm dialer was tested and was functioning at the time of the inspection.
- Overall the station was clean and well maintained.

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SECTION III

CONCLUSION AND RECOMMENDATIONS

III.1 Pump Station Specific

Pump Station No. 1 - Rt. 206 South @ Lubbers Run:

- Servicing of the check valves is highly recommended. Failure of the check valves can lead to diminished pump performance, pump damage and/or wet well overflows.
- The Emergency Generator should be evaluated by an authorized Kohler representative. See *Section III-2 General* below.
- Concrete and equipment repairs which were recommended in the prior report have been done.
- Hydrogen Sulfide gas mitigation, as previously recommended to reduce further deterioration within the wet well, has been implemented in the form of activated carbon filtration. The system appears to be effective. Carbon must be replaced on a regular basis (1 to 2 times per year depending upon actual conditions)

Pump Station No. 2- Rt. 206 South near Lackawanna Drive:

- Fats, Oils & Grease (F.O.G.) continue to be a major concern at the pumping station. The Licensed Operator is effectively managing F.O.G. through the use of a F.O.G. reducing agent and frequent wet well cleaning. Continued source management is critical, as further outlined in *Section IV - Grease Control*.
- The four inch force main between Station No. 2 and Station No. 1 has clogged in the past with grease. Grease can build up on the walls of pipes, significant reducing flow capacity, and leading to clogs. Due to pipe realignment performed under the Route 206 widening, much of this force main has been replaced. The Township must conscientiously manage grease in order to protect the integrity of the force main.
- The Emergency Generator should be evaluated by an authorized Kohler representative. See *Section III-2 General* below.
- Servicing of the check valves is highly recommended. Failure of the check valves can lead to

diminished pump performance, pump damage and/or wet well overflows.

- Hydrogen Sulfide gas mitigation, as previously recommended to reduce further deterioration within the wet well, has been implemented in the form of activated carbon filtration. The system appears to be effective. Carbon must be replaced on a regular basis (1 to 2 times per year depending upon actual conditions)

Pump Station No. 3- Municipal Complex behind Dog Pound:

- Both pumps are past their useful life and should be replaced. This may require addition starter and control work since these pumps are almost 20 years old.
- Float condition should be further evaluated and floats should be serviced or replaced if necessary.
- The Emergency Generator should be evaluated by an authorized Kohler representative. See Section III-2 General below.
- Servicing of the check valves is highly recommended. Failure of the check valves can lead to diminished pump performance, pump damage and/or wet well overflows.
- The concrete around the electric panel should be repaired to eliminate further deterioration.
- Exterior exposed metal should be painted.

Pump Station No. 4 – 55 Lackawanna Drive:

- Servicing of the check valves is highly recommended. Failure of the check valves can lead to diminished pump performance, pump damage and/or wet well overflows.
- Exterior exposed metal should be painted.

Pump Station No. 5 - Behind Byram Intermediate School:

- Both pumps are past their useful life and should be replaced. This may require addition starter and control work since these pumps are almost 20 years old.
- The Emergency Generator should be evaluated by an authorized Kohler representative. See Section III-2 General below.

- The concrete around the electric panel should be repaired to eliminate further deterioration.
- Exterior exposed metal should be painted.
- The perimeter fence should be repair to improve security and aesthetics.
- Site lighting should be supplemented to improve operator safety.

Pump Station No. 6- Behind Byram Lakes School:

- General maintenance and housekeeping should continue.

III.2 Sewer Inspection

All gravity sewer lines should be cleaned and CCTV inspected. If possible, this should be scheduled for a time when groundwater levels are high, so that sources of infiltration (groundwater entering the system) can be more easily identified. Some segments were recently cleaned and inspected as part of the Route 206 widening project. A summary of the gravity lines within the system, including information on if/when they were cleaned and inspected, is appended to this Report.

III.3 General

- It is recommended that the Township prepare an Asset Management Plan, as recommended by the NJDEP. An Asset Management Plan is a tactical strategy for managing an organization's infrastructure and other assets to deliver an agreed standard of service. The plan would individually identify all parts of the system, plan maintenance schedules, plan for and identify funding for replacements, etc. There are a number of software programs available, including a free program (CUPPS) available through the USEPA.
- It is strongly recommended, based upon the age of the system, that the Township immediately establish and fund a Renewal & Replacement Fund. See Section IV of this Report.
- Statistically, Emergency Generators have a useful life of between 10,000 and 30,000 hours (depending upon type of use, maintenance, location, etc...). Since these Generators have over 10,000 hours, they should be fully evaluated by an authorized Kohler representative. In

addition to checking of all major systems and components, the evaluation should include load bank testing.

- A maintenance schedule should be established for cleaning and Closed Circuit TV (CCTV) inspection of all sanitary sewer lines. It is strongly recommended that the remainder of the lines be done as soon as possible, and then all lines be done every 10 years thereafter. See *III.2 Sewer Inspection* above.
- All force mains should be located and marked out. Visual inspections should be done annually, as recommended by the NJDEP. These visual inspections can reveal evidence of future problems.
- The air release valve located on the force main between Pump Station #2 and #1 should be inspected and maintained for proper operation.
- Although not required by the NJDEP based upon the size and type of system, it is recommended that an Operation and Maintenance Manual be prepared. At a minimum, the manual should describe the following:
 - System Operation
 - Operator and staff responsibilities
 - Staff guidance for emergency situations
 - Program of regularly scheduled inspection and maintenance
 - Confined space entry and lock out tag out procedure
 - Emergency plan, in accordance with NJDEP regulations, which is quite extensive
- As required by the NJDEP, the Township should designate a backup Licensed Operator for times when the regular Operator is not available.
- General maintenance and housekeeping should continue.
- Spare parts should be in stock as recommended by the O&M Manuals for each station.

III.4 Cost of Recommendations

The following provides a preliminary cost estimate to implement the major recommendations made above.

Task	Approximate Cost
1. Evaluate, service and repair/replace check valves at all stations	\$10,000 - \$20,000
2. Emergency Generator evaluation, testing, repairs (including parts) *	\$8,000 - \$15,000
3. Grease Monitoring and Source Reduction Plan (annually)	\$1,500
4. Replace carbon in Odor Control units (2 units)	\$1,000
5. Pump & Float repair/replacement @ PS#3	\$7,000 - \$10,000
6. Perimeter Fence Repair @ PS#5	\$2,000 - \$4,000
7. Painting at all stations	\$500 - \$1,000
8. Create Asset Management Plan	\$5,000 - \$7,000

*This does not include the cost of replacement, if necessary. See *Section IV* for costs.

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SECTION IV

RENEWAL AND REPLACEMENT FUND ANALYSIS

The following analysis provides the basis for a Renewal and Replacement Fund which will provide the necessary financing for upgrades to or replacement of critical structures and equipment in the sanitary sewer system. This format is typical of that used by most wastewater utilities.

Pump Station No. 1 - Rt. 206 South @ Lubbers Run

Equipment	Replacement Cost	Useful Life	R&R Per Year	Present Age	Accrued Replacement
Pump No. 1	\$10,000	10	\$1,000	2	\$2,000
Pump No. 2	\$10,000	10	\$1,000	2	\$2,000
Check & Gate Valves	\$5,000	10	\$500	5	\$2,500
Flow Meter	\$5,000	15	\$300	18	\$5,000
Control Panel Parts	\$10,000	10	\$1,000	18	\$10,000
Generator	\$30,000	20	\$1,500	18	\$27,000
Miscellaneous Parts	\$5,000	10	500	10	\$5,000
			Subtotal		\$53,500

Pump Station No. 2 - Rt. 206 South near Lackawanna Drive

Equipment	Replacement Cost	Useful Life	R&R Per Year	Present Age	Accrued Replacement
Pump No. 1	\$10,000	10	\$1,000	2	\$2,000
Pump No. 2	\$10,000	10	\$1,000	2	\$2,000
Check & Gate Valves	\$5,000	10	\$500	5	\$2,500
Control Panel Parts	\$10,000	10	\$1,000	18	\$10,000
Generator	\$30,000	20	\$1,500	18	\$27,000
Miscellaneous Parts	\$5,000	10	\$500	10	\$5,000
			Subtotal		\$48,500

Pump Station No. 3 - Municipal Complex behind Dog Pound

Equipment	Replacement Cost	Useful Life	R&R Per Year	Present Age	Accrued Replacement
Pump No. 1	\$7,500	10	\$750	18	\$7,500
Pump No. 2	\$7,500	10	\$750	18	\$7,500
Valves	\$5,000	10	\$500	18	\$5,000
Control Panel Parts	\$10,000	10	\$1,000	18	\$10,000
Generator	\$27,000	20	\$1,353	18	\$24,300
Miscellaneous Parts	\$5,000	10	\$500	18	\$5,000
			Subtotal		\$59,300

Pump Station No. 4 - 55 Lackawanna Drive

Equipment	Replacement Cost	Useful Life	R&R Per Year	Present Age	Accrued Replacement
Pump No. 1	\$4,500	10	\$450	18	\$4,500
Pump No. 2	\$4,500	10	\$450	18	\$4,500
Valves	\$3,000	10	\$300	18	\$3,000
Control Panel Parts	\$3,000	10	\$300	18	\$3,000
Generator *	N/A	N/A	N/A	N/A	N/A
Miscellaneous Parts	\$4,000	10	\$400	18	\$4,000
			Subtotal		\$19,000

This station will likely need an emergency generator in the future, depending upon actual future use of the building.

Pump Station No. 5 - Behind Byram Intermediate School

Equipment	Replacement Cost	Useful Life	R&R Per Year	Present Age	Accrued Replacement
Pump No. 1	\$4,500	10	\$450	18	\$4,500
Pump No. 2	\$4,500	10	\$450	18	\$4,500
Valves	\$3,000	10	\$300	18	\$3,000
Control Panel Parts	\$3,000	10	\$300	18	\$3,000
Generator	\$25,000	20	\$1,250	18	\$22,500
Miscellaneous Parts	\$5,000	10	\$500	18	\$5,000
			Subtotal		\$42,500

Pump Station No. 6 - Behind Byram Lakes School

Equipment	Replacement Cost	Useful Life	R&R Per Year	Present Age	Accrued Replacement
Pump No. 1	\$4,500	10	\$450	9	\$4,050
Pump No. 2	\$4,500	10	\$450	9	\$4,050
Valves	\$3,000	10	\$300	9	\$2,700
Control Panel Parts	\$3,000	10	\$300	9	\$2,700
Generator	\$30,000	N/A	N/A	N/A	N/A
Miscellaneous Parts	\$5,000	10	\$500	9	\$4,500
			Subtotal		\$18,000

Collection System

Equipment	Replacement Cost	Useful Life	R&R Per Year	Present Age	Accrued Replacement
Air Release (Rt. 206)	\$3,000	15	300	1	\$300
Air Release (Mansfield)	\$3,000	15	300	18	\$2,000
Cleanout Valves (4 – Lubbers Run Bridge)	\$6,000	15	400	1	\$1,000
Misc. Pipe Repairs	\$100,000	50	\$2,000	18	\$36,000
			Subtotal		\$39,300

The analysis indicates that a liability of approximately \$280,100 exists. The Township should have this amount of funds dedicated for renewal and/or replacement of these system critical components. Section III of this report provides recommendations for immediate renewal and replacement.

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SECTION V

GREASE CONTROL

F.O.G. (fats, oils & grease) has been a major problem in Pump Station No. 2 (and the downstream system) for many years resulting in high periodic cleaning and grease removal costs, additional maintenance and operations issues, equipment damage, and clogging of lines. As a result of this problem, the Township passed Ordinance 13-2006 at their August 7, 2006 meeting. This ordinance requires the annual licensing of grease interceptors for Class B users with the potential to emit significant grease. Licensed Class B users within the system are listed below:

- Quik Chek Plaza
- Classic Bagel
- Byram Donuts
- Byram Diner
- Gordon Group - Byram Plaza

On February 2, 2007, these facilities were inspected. Based upon that inspection, recommendations for maintenance of the grease interceptors were made.

Although each establishment is a contributor of grease to some extent, it was determined the main area of concern at the present time was the Byram Plaza, which contains a considerable number of grease generators. Subsequent inspections of the sewer lines and manholes which convey flow from the development revealed considerable grease accumulations. As a result, Byram Plaza apparently instituted a comprehensive grease management program. Since that time, while there has been a reduction in the volume of grease accumulating in Pump Station No.2, the problem persists

It is therefore strongly recommended that the Township continue to enforce Ordinance 13-2006. This enforcement plan should include periodic sampling of key manholes for FOG levels as well as performing regular inspections of all Licensed Class B facilities. These inspections should include review of grease interceptor maintenance records to confirm source F.O.G. management. Some revision of the Sewer Use Ordinance may be required to support a more aggressive approach to grease reduction.

APPENDIX

Township of Byram
Sanitary Sewer System

Gravity Sewer Summary

Sewer Line	Segment	MH #	MH#	Pipe Size (in Dia)	Length (Ft)	Inspection Date	Comments
Line 1	1a	1.1	1.2	10"	218	none	
Line 1	1b	1.2	1.3	10"	164	none	
Line 1	1c	1.3	1.4	10"	199	none	
Line 1	1d	1.4	1.5	10"	183	none	
Line 1	1e	1.5	1.6	10"	232	none	
Line 2	2a	2.9	2.8	8"	172	Nov-14	By NJDOT Contractor
Line 2	2b	2.8	2.7	8"	240	Nov-14	By NJDOT Contractor
Line 2	2c	2.7	2.6	8"	254	Nov-14	By NJDOT Contractor
Line 2	2d	2.6	2.5	8"	200	Nov-14	By NJDOT Contractor
Line 2	2e	2.5	2.4	8"	143	Nov-14	By NJDOT Contractor
Line 2	2f	2.4	2.3	8"	74	Nov-14	By NJDOT Contractor
Line 2	2g	2.3	2.2	8"	86	Nov-14	By NJDOT Contractor
Line 2	2h	2.2	2.1	8"	198	Nov-14	By NJDOT Contractor
Line 2	2i	2.1	PS#1	8"	15	Nov-14	By NJDOT Contractor
Line 3	3a	3.8	3.7	8"	220	none	
Line 3	3b	3.7	3.6a	8"	249	none	
Line 3	3c	3.6a	3.6	8"	45	none	
Line 3	3d	3.6	3.5	8"	80	none	
Line 3	3e	3.5	3.4	8"	224	none	
Line 3	3f	3.4	3.3	8"	304	none	
Line 3	3g	3.3	3.2	8"	134	none	
Line 3	3h	3.2	3.1	8"	190	none	
Line 3	3i	3.1	2.2	8"	120	none	
Line 4	4a	4.4	4.5	8"	224	Nov-14	By NJDOT Contractor
Line 4	4b	4.3	4.4	8"	284	Nov-14	By NJDOT Contractor
Line 4	4c	4.2	4.3	8"	64	Nov-14	By NJDOT Contractor
Line 4	4d	4.1	4.2	8"	115	Nov-14	By NJDOT Contractor
Line4	4e	4.21	4.2	8"	200	Nov-14	By NJDOT Contractor
Line 4	4f	PS#2	4.1	8"	60	Nov-14	By NJDOT Contractor
Line 5	5a	5.12.1	5.12.2	8"	334	Nov-14	By NJDOT Contractor
Line 5	5b	5.12	5.12.1	8"	140	Nov-14	By NJDOT Contractor
Line 5	5c	5.11	5.12	8"	394	Nov-14	By NJDOT Contractor
Line 5	5d	5.10	5.11	8"	244	Nov-14	By NJDOT Contractor
Line 5	5e	5.9	5.10	8"	192	Nov-14	By NJDOT Contractor
Line 5	5f	5.8	5.9	8"	102	Nov-14	By NJDOT Contractor
Line 5	5g	5.7	5.8	8"	130	none	
Line 5	5h	5.6	5.7	8"	172	none	
Line 5	5i	5.5	5.6	8"	248	none	
Line 5	5j	5.4	5.5	8"	262	none	
Line 5	5k	5.3	5.4	8"	338	none	
Line 5	5l	5.2	5.3	8"	285	none	
Line 5	5m	5.1	5.2	10"	84	none	
Line 5	5n	4.1	5.1	10"	293	none	
Line 6	6a	6.3	6.4	8"	44	none	
Line 6	6b	6.2	6.3	8"	378	none	
Line 6	6c	6.1	6.2	8"	226	none	
Line 6	6d	PS#3	6.1	8"	32	none	



35 Sparta Avenue
Sparta, New Jersey 07871
Phone (973) 300-9003
Fax (973) 300-4003
www.cppsc.com

December 18, 2015

Mr. Joseph Sabatini, Township Manager
Township of Byram
10 Mansfield Drive
Stanhope, New Jersey 07874

Re: Professional Engineering Services
Pump Station No. 3 Rehabilitation

Dear Mr. Sabatini:

As requested by Adolf Steyh, CP Engineers, LLC. (CP) is pleased to submit this Proposal for professional engineering services related to the rehabilitation of Sanitary Sewer System - Pump Station No. 3. As you know, PS#3 recently had a catastrophic failure and has a temporary repair in place. A significant rehabilitation of the station is necessary to avoid future failures.

Scope of Services

The Scope of Work for the project, as discussed with Mr. Steyh, was to replace the pump systems (pumps/pump bases/rails), all discharge piping, shut off valves, check valves, install fittings for bypass pumping, replace emergency generator and transfer switch, and other misc. rehabilitations.

The Scope of Services includes the following:

1. Contract Document Preparation
 - a. Data Collection
 - b. Equipment Selection
 - c. Design Development
 - d. Design Status Meetings
 - e. Development of "Front End" Specifications
 - f. Development of Technical Specifications
 - g. Document Reproduction (15 sets)
2. Bid Phase Services
 - a. Coordinate Advertisement with the Township.

- b. Respond to Bidder questions during the bidding period.
 - c. Prepare and issue addenda, as appropriate.
 - d. Analyze and tabulate the bid results.
 - e. Prepare a Bid Report and furnish an award recommendation letter.
 - f. Assist Township with execution of Contracts and issuance of Notice to Proceed.
3. Construction Services
- a. Review of Construction Progress Schedule and Schedule of Values.
 - b. Coordinate and conduct a preconstruction meeting.
 - c. Review Contractor submittals in accordance with the Contract Plans and Specifications.
 - d. Review of all product warranties.
 - e. Provide periodic on-site construction engineering services, as needed.
 - f. Witnessing equipment startup and field testing.
 - g. Review, negotiate and process change order requests.
 - h. Review and processing of Contractors payment requests.
 - i. Provide closeout services and final certification.

Schedule

We are prepared to proceed with the work immediately upon your authorization. We expect to complete the Contract Documents (95%) for Township Review within 45 days. Scope of Services items 2 and 3 will be completed based upon the final schedule agreed upon with and authorized by the Township.

Cost Proposal

CPE proposes to bill for this effort at the following Lump Sum costs

1.	Contract Document Preparation	\$ 7,400
2.	Bid Phase Services	\$ 1,800
3.	Construction Services	<u>\$ 6,700</u>
Total Cost		\$15,900

Billing will be monthly, based upon percent complete.

We propose to complete this work under the provisions of our Annual Agreement.



We greatly appreciate the opportunity to provide this proposal and our continued relationship with the Township. Should you have any questions concerning our Proposal, please do not hesitate to contact me.

Sincerely,
CP ENGINEERS, LLC

A handwritten signature in blue ink, appearing to read "Stephen Donati", is written over a horizontal line.

Stephen Donati, P.E.,
Vice President

cc: Adolf Steyh, DPW Superintendent

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