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December 18, 2014

Mr. Mark Flanders, Authority Manager
Pottstown Borough Authority (PBA)
Pottstown Borough Hall
100 East High Street
Pottstown, PA 19464

RE: Comprehensive Review of Sanitary Sewer System;
Final Report,
Pottstown Borough Authority, Montgomery County, PA

Dear Mr. Flanders:

As discussed, please find attached twelve (12) hard copies of the above referenced Final Report with respect to the comprehensive review of the sanitary system. Also attached is a USB thumb drive with the electronic pdf report files contained therein.

We trust that we have addressed all the PBA and Township comments pertaining to the report. However, if you have any other questions or comments, please do not hesitate to contact me directly at 215.496.4727 (office) or 610.731.5444 (cell) or by email at smarcino@jmt.com.

Thank you for the opportunity to be of service to the Authority and to the surrounding Townships.

Best Regards,

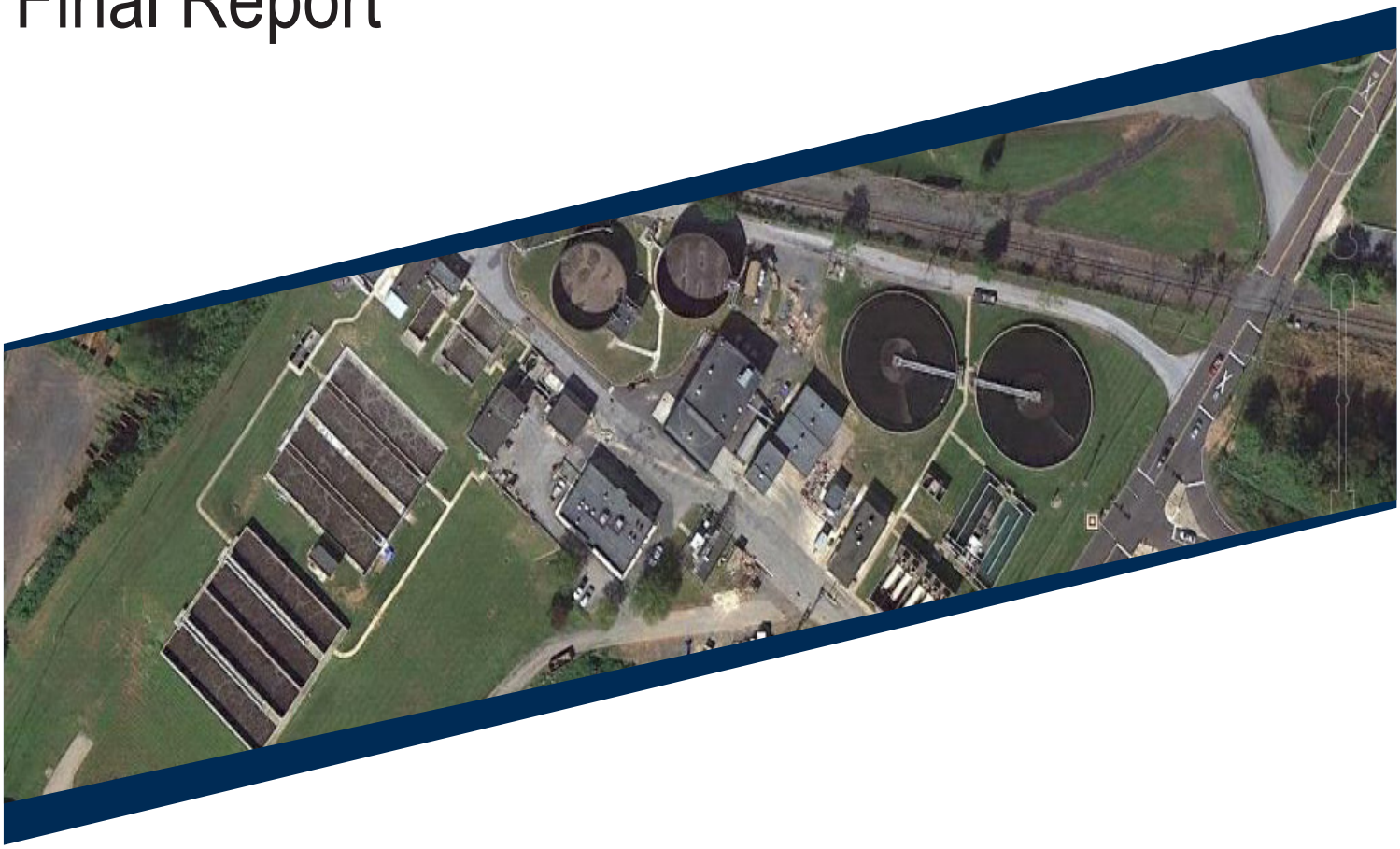
Stephen A. Marcino, P.E.
Project Manager

SAM

Attachments

Cc:
Brent Wagner - PBA
Thomas Weld, PE – BCM

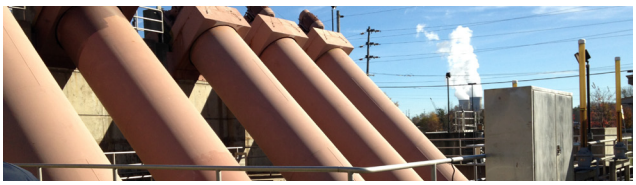
Final Report



Comprehensive Review
of Sanitary Sewer System for the Pottstown Borough Authority

December 2014

JOHNSON, MIRMIRAN & THOMPSON



Executive Summary

In January 2014, the Pottstown Borough Authority (PBA) engaged Johnson, Mirmiran & Thompson (JMT) as an independent firm to provide a comprehensive review of the regional wastewater system. M&B Operations and Mr. Myron Olstein, a financial and benchmarking consultant, are subconsultants to JMT as part of an overall evaluation team.

The Authority serves over 35,000 customers, located in northern Montgomery County, Pennsylvania (PA) with wastewater service. It is a complex regional system in terms of how it is organized, but not an uncommon one in PA. The Authority owns a 15.6 MGD wastewater treatment facility (plant) and sanitary collection system. Customers include not only the Borough of Pottstown, but also as additional neighboring wholesale customers, Lower Pottsgrove, Upper Pottsgrove and West Pottsgrove Townships, respectively. Meanwhile, the Borough of Pottstown Utilities department operates and maintains the plant while the Public Works department operates and maintains the Borough's sanitary sewer collection system. Finally, the respective contributing municipalities also own, operate and maintain their collection system, which ultimately convey wastewater to the Authority's plant for treatment in accordance with a "Sewage Treatment Service Agreement."

The purpose of this evaluation was to assess current operations, maintenance and management procedures and practices with respect to its wastewater treatment plant, as well as contributing collection systems owned by the neighboring municipalities. One objective of the evaluation was to determine if the systems provide for adequate operations and maintenance (O&M) services protocol, as compared to other local and regional utilities of similar size and nature. In short, the Authority requested a "report card" to assess how they, and the Townships to some degree, are doing compared to other similarly sized facilities. This review also includes an evaluation of the plant unit processes as well as the Borough's workforce (organization and staffing levels) to identify any areas where staffing enhancements and/or adjustments may be warranted.

As part of this study, JMT systematically reviewed each unit process at the plant with respect to operations, procedures and practices, staffing assignments and adequacy to identify any needed operational changes. Further, we provided an assessment of current operations. Finally, we made recommendations on improving current practices, operational efficiencies and levels of service. The ultimate goal is to improve upon current practices that can be implemented in a manner that is fair and equitable to all parties involved including the Townships.

Our assessment of current operations as well as our recommendations moving forward are summarized below:

Assessment of current operations:

As a result of the study, JMT summarizes our assessment of current operations and our findings are indicated as follows:

1. As far as the existing wastewater treatment plant is concerned, the plant is generally well managed, operated and maintained with current staff, management and business practices in place.
2. With respect to the condition of the plant, which was originally built in 1931 and last upgraded in 1991, with subsequent improvements made since then including the installation of a thermal dryer to produce Class A biosolids, the plant is sufficient to handle average daily flow. The plant is reportedly in compliance with its permit and the plant is not considered to be hydraulically overloaded based upon average monthly flow data. However, the plant does see a dramatic increase in flow during a heavy rain event demonstrating very high peaking factors. Comparing average to peak flow, for

example, during a normal dry day, average flows are approximately 5 MGD. In April 2014, during a recent heavy rain event, flows were estimated at over 50 MGD, which causes operational problems at the plant. Note the existing flow meter cannot accurately record flows in excess of 32 MGD so a new flow meter will be installed at the end of 2014 to accurately record wet weather flows.

3. With respect to solids processing, in 2005, PBA invested significant capital ($6.6 million) at the plant, which included new centrifuges and a new dryer to produce a high quality Class A product. Despite operational problems related to the dryer, when functioning, this system generally works well to produce Class A material, which costs 40% less to dispose of as compared to Class B material without the dryer. This affords PBA flexibility in terms of disposal options.
4. The overall plant is generally efficient. Most large motors have variable frequency drives or have been replaced with such, which improves efficiencies to save electricity, except for the aeration tank blowers. JMT did not perform an electrical audit at the plant and PECO performed 2 electrical audits at the plant.
5. One challenge is that there is no emergency generator at the plant for back-up power, so PBA relies on 2 power sources/feeds from PECO, which have recently proven to be unreliable during a power outage.
6. The major capital future line item is the installation of a new final clarifier located at the end of the plant. This project has been put on hold until further evaluation due to the cost ($2.0 million) and need. A cost/benefit analysis should be prepared before the third clarifier is designed. It is our understanding that a new flow meter will be installed in 2014 and after such time, additional analysis will be performed.
7. In terms of personnel at the plant; there are 14 full time equivalents (FTEs), who are assigned to the plant and pump stations (plus the water treatment plant that is outside this scope). PBA is at or below local and national staff levels given the complexity of the system as well as roles and responsibilities.
8. With regards to staff compensation and for comparison purposes only: PBA operators fall within an acceptable range of plant personnel salary levels in the industry and on a local level. However, some utility management salary ranges tend to be at or below average local levels per the PMAA salary report, plus national levels per the AWWA salary reports.
9. Procurement and purchasing procedures are acceptable and sufficient and by all indications, are being implemented by PBA.
10. Maintenance procedures are mainly "paper based" per the working knowledge of the Utilities Director, his staff and manufacturers' recommendations. Maintenance procedures are actively preventive and in some cases, reactive yet could be more predictive; which is why PBA would benefit from a new maintenance program that incorporates a new asset management system.
11. Budgeting procedures are sufficient; however, they can be refined in order to decrease the gap separating budgeted costs and actual costs, such that actual costs come in within 10% of budgeted costs. PBA has developed a contingency fund to account for unforeseen or emergency events and expenses, which is a good business practice.
12. Despite a stagnant growth rate (2.4% from 2000-2010), PBA maintains a good cash position and should have no problem meeting its current debt service obligations.
13. JMT collected some local sewer rate data; however, did not perform a rate study and no decision has been made with regards to raising rates in 2015 and beyond. Rates were increased in 2014.

Recommendations:

As a result of the study, PBA should consider the following recommendations for improvement moving forward:

A. Management and Finance

1. Implement an electronic operations and maintenance management system. PBA should evaluate a

new software program to manage operation and maintenance protocol for each unit process at the plant, including an inventory of spare parts.

2. PBA should continue to receive outside solids (both septage and outside waste) to sustain or raise revenues. Increasing the septage and imported rates that PBA charges to outside customers, since their rates are relatively low, will further increase revenue over time. We recommend a phased approach whereby PBA marginally raises septage and imported solids rates to its customers.
3. Evaluate and rebid the polymer used at the plant relative to dewatering facilities (thickeners and centrifuges) since this is a high cost line item in the budget. Consider mixing the polymer on site versus buying the polymer in bulk already pre-mixed.
4. Differentiate and track "non-utility" work or "donated time" including; but not limited to: snow plowing, maintenance of dog kennel at the plant, etc. While this time is minimal, it should be tracked on an on-going basis for budgetary purposes.
5. Semantically, we would recommend changing the words "sewage" to "wastewater" and the word "sludge" to "biosolids" in all reports moving forward.
6. A succession plan should be prepared as soon as possible as the average age of plant staff is 58.

B. Wastewater Treatment Plant

1. Perform a cost/benefit analysis to install new emergency generators for backup power at the plant. Currently, 2 PECO power lines, as dual feeds, provide power to the plant, but have recently been determined unreliable due to a recent power outage. PBA should meet with PECO to determine "root cause" as to why this happened. Also, permanent versus rental generators should also be considered.
2. In the short term, PBA should become a member of PAWARN, a service that provides auxiliary power services for a nominal fee.
3. Upgrade SCADA system throughout the plant to increase levels of automation as well as to increase monitoring and control capabilities. A built out SCADA system is planned in the 5 year Capital Improvement Plan (CIP) for implementation by 2016.
4. Due to risk management and safety issues, perform cost/benefit analysis to install Ultraviolet light (UV) disinfection or a liquid chlorine disinfection system to replace the gaseous chlorine. Onsite generation of liquid chlorine (Miox®) can also be considered.
5. Improve and refine the High Water Service plan and evaluate alternate solutions to address the high level of flow caused by rain events, other than the installation of a third clarifier, such as high rate ballasted flocculation, equalization or the Comag® process, etc. at the head of the plant. It is our understanding that an alternative analysis has been prepared of various treatment technologies that we have not reviewed. Life cycle costs should be prepared for each alternative. Last, limited space at the plant is a factor as 60% of the plant is situated in the 100 year flood plain.
6. Replace the 4 aeration tank blowers (existing centrifugal blowers, constant speed) with positive displacement blowers with VFDs to improve efficiencies. Install DO probes in each aeration zone for blower control. It is our understanding that this project is included in the Capital Improvement Plan, scheduled to be implemented by 2017.
7. Keep the dryer on-line and in production to continue to produce Class A biosolids. Additional revenues can be generated if PBA can identify customers (farmers or landscapers), who are willing to pay for Class A material or dispose of it at no additional cost. Further, consider running the dryer seasonally to reduce wear and tear during times when Class A product is in lower demand to extend the life of the dryer.
8. Join the Mid-Atlantic Biosolids Association (MABA) to network with other utilities, who have dryers to find more ways to optimize biosolids processing at the plant.
9. Adopt the National Fire Protection Association (NFPA) chemical labeling system for all chemicals used throughout the plant and at the pump stations for safety and informational purposes.
10. Conduct a vulnerability assessment and install a gate card reader at the main gate. This project consisting of gates and cameras has been added to the current Capital Improvement Plan for

consideration by 2017.

11. The screw pumps are maintenance intensive and consideration should be given to replacing them with submersible pumps, but only as each screw pump goes down for maintenance (due to bearings, motors, shafts, etc.) The issue of potential "shearing of the floc" would have to be considered.

C. Collection and Conveyance Systems

1. PBA meets with the Townships on a monthly basis to discuss cost and billing data and we believe the level of communication is sufficient. However, providing the financial data to the Townships as soon as possible will help them better manage their respective budgets on a monthly basis.
2. As the PBA is the permittee of the NPDES permit at the plant, and therefore, is mostly held responsible for compliance with the PaDEP and to some extent EPA, Townships, as wholesale customers, should not be put on the PBA board as decision makers.
3. Townships should significantly increase and accelerate their activity with respect to reducing Inflow and Infiltration (I/I), which are among the highest levels in the state. Corrective Action Plans (CAPs) are in place for Upper Pottsgrove and Lower Pottsgrove Townships, and they should make additional physical improvements to their respective systems, to not just meter flow and televise sewers, but to rehabilitate their system in a strategic way, to reduce I/I thereby reducing flow to the plant.
4. Flow meter data should be accurate and made available online for consistency to raise visibility among the stakeholders. Recently, PBA brought online a new monitoring system called, "Enterprise" that we have not reviewed as part of this study that would provide flow metering data online to improve transparency of data.
5. The nature of the Sewer Agreement is common in the industry and sufficient in terms of content and spirit; however, should be amended to allow for revised allocated capacity from the Borough and Townships. The penalties are comparatively high if their allocated capacities are exceeded (which happened to Upper Pottsgrove TWP in 2013); however, given the severity at the plant due to significant I/I, they are somewhat warranted to provide reinforcement to the Borough and Townships to reduce I/I. The last update to the Sewer Agreement was 2002, so it should be revisited and amended accordingly, at which time penalties could be renegotiated.
6. Muffin Monsters® or comminutors should be installed or retrofitted at each pump station to protect the pumps.
7. The Borough's I/I program is reactive rather than proactive. To implement a more cohesive and functional I/I program, at a minimum, the program should include the following elements:
   - Flow monitoring program - aimed in strategic locations that can aid the Borough in understanding the impacts to the sewer system during wet weather events. It should also assist in quantifying the amount of flow from each contributing municipality to better document the quantity of receiving flow.
   - Sanitary Sewer Evaluation Survey (SSES) – A SSES program will help the Borough in terms of prioritizing the areas where I/I can be successfully removed. A typical SSES program would consist of the following evaluation techniques:
     - Smoke testing
     - CCTV inspections
     - Manhole inspections
     - Dye water testing

     SSES programs can range in cost and time depending on the scope of the project; however, an effective flow-monitoring program will drive where SSES techniques are most effective.

List of Acronyms / Abbreviations

ADF ..... Average Daily Flow
AWWA ..... American Water Works Association
CAPEX ..... Capital Expense
CI ..... Continuous Improvement
CIP ..... Capital Improvement Plan
CSO ..... Combined Sewer Overflow
CWA ..... Clean Water Act
DIP ..... Ductile Iron Pipe
DO ..... Dissolved Oxygen
EPA ..... Environmental Protection Agency
FOG ..... Fats, Oils & Grease
FTE ..... Full Time Equivalent
GIS ..... Geographic Information System
I/I ..... Inflow & Infiltration
In ..... Inch(es)
JMT ..... Johnson, Mirmiran & Thompson
LF ..... Linear Feet
MGD ..... Million Gallons per Day
MMS ..... Maintenance Management System
NACWA ..... National Association of Clean Water Agencies
O&M ..... Operation & Maintenance
OPEX ..... Operating Expense
OPS FTE ..... Operating Full Time Equivalent
PBA ..... Pottstown Borough Authority
POTW ..... Publically Owned Treatment Works
R&R ..... Repair and/or Rehabilitation
RFP ..... Request for Proposals
SIU ..... Significant Industrial User
SOP ..... Standard Operating Procedure
TOE ..... Total Operating Expense
VFD ..... Variable Frequency Drive
WTF ..... Water Treatment Facility
WWTF ..... Wastewater Treatment Facility

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I. INTRODUCTION

In January 2014, the Pottstown Borough Authority (PBA) engaged JMT, as a third party and independent firm, to provide an evaluation of their complete wastewater system. The Authority serves over 35,000 customers, who are located in northern Montgomery County, Pennsylvania (PA) within four municipalities: the Borough of Pottstown (Borough) itself, plus neighboring Lower Pottsgrove, Upper Pottsgrove and West Pottsgrove Townships, respectively. The system, although complex, is not an uncommon arrangement in PA. The Authority owns a 15.6 million gallon per day (MGD) wastewater treatment facility (plant) (in addition to a water treatment plant that is outside the scope of this study) plus the sanitary collection system. Further, Borough staff operates and maintains the plant and the sanitary collection system. Last, the respective contributing municipalities, as wholesale customers of PBA, each own collection and conveyance systems, all of which convey raw wastewater flow to the Authority's plant for treatment.

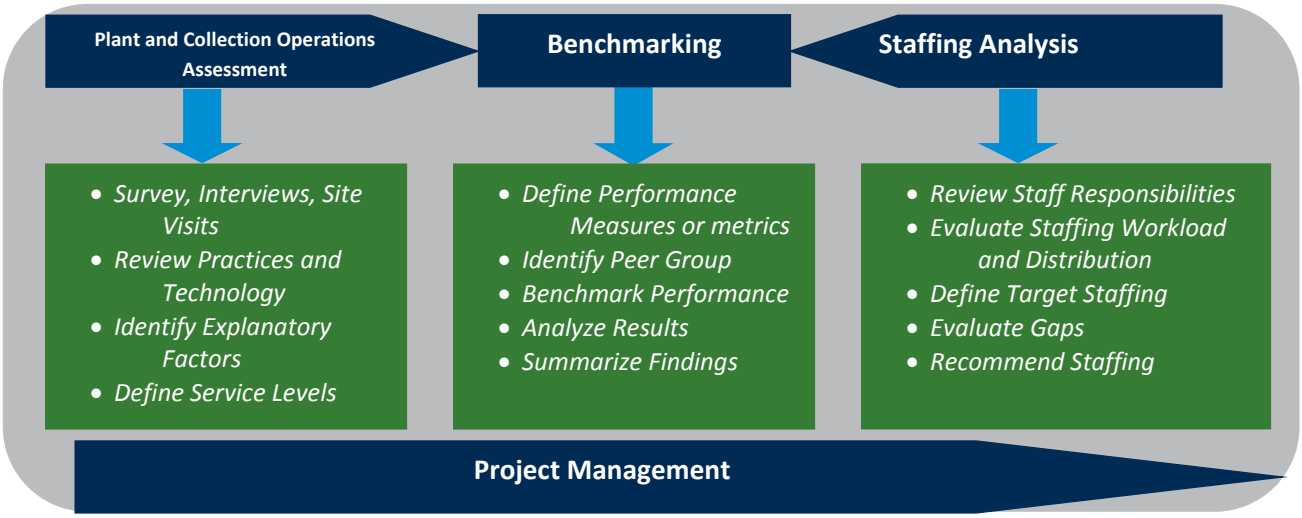
The scope of this evaluation is to assess current management, operations and maintenance procedures and practices with respect to its wastewater treatment plant and contributing collection systems. One objective of the evaluation is to determine if the systems provide for adequate basic operations and maintenance (O&M) services protocol, as compared to other local and regional utilities of similar size and nature. In addition, this review also includes an evaluation of the Borough's workforce, to potentially identify areas where staffing enhancements and/or adjustments may be warranted.

Using the JMT team's combined management, operations and engineering expertise we systematically reviewed each unit process at the plant from an operational perspective, along with procedures, practices, staffing assignments to identify any needed operational changes. Finally, we make recommendations to improve operational efficiencies and levels of service. The goal of the study is basically twofold: to assess current operations and to provide areas for improvement moving forward, in a manner that is fair and equitable to all stakeholders involved, including the townships.

A. Scope of Services

Based on discussions with the Authority the JMT team performed the scope of work pursuant to the Request for Proposal (RFP). Facilitated by benchmarking techniques as a tool, combined with interviews and evaluations, we integrated three tasks to assess plant and collection system operations and maintenance practices, along with organization and staffing levels, measured against plant performance. Figure 1 below illustrates the overall framework of the study that ties everything together.

Figure 1
Evaluation Framework



Pursuant to the RFP, the scope of services is summarized and presented in Appendix A in outline form:

To address the tasks in the RFP, our review consisted of plant walkthroughs, observations of operations, document reviews, interviews, analysis, benchmarking and validation. Benchmarking is a useful tool in performing operations and management reviews by assessing plant performance in various categories, compared against regional and national facilities of similar size. Our benchmarking data came from the following sources:

- The 2011 National Association of Clean Water Agencies (NACWA) Financial Survey. This is a survey that has been conducted every three years since 1980 providing a high degree of reliability to the gathered data. The 2011 survey included 117 wastewater utilities with a served population in excess of 70 million.
- The 2013 American Water Works Association Compensation Survey – Small and Medium Sized Utilities (Utilities with a served population less than 100,000), Eighteenth Annual Report (AWWA, Denver, August 2013).
- Data gathered from a number of Pennsylvania wastewater utilities – Derry Township, Wyomissing, Valley Forge, Downingtown, Exeter Township and Lancaster, PA.
- Data from special surveys performed by the consulting team. This included plant upkeep surveys, Pennsylvania rate surveys and salary surveys.
- The 2012 American Water Works Association (AWWA)/Water Environment Federation (WEF) Qualserve survey. This survey has been conducted regularly since 2002. The 2012 survey population consisted of 105 utilities, 64 of which provide wastewater services.

After being engaged by the Authority to conduct this study, as a first step, we requested to review a significant amount of documentation broken down by priority. The JMT letter to the Authority requesting this documentation and a list of the gathered documentation reviewed is included as Appendix B.

This report is broken down by first, a discussion pertaining to PBA in terms of its management and financial practices and wastewater treatment plant unit processes, followed by an assessment of collection systems and pump stations owned and maintained by the Borough plus the adjacent Townships as wholesale customers.

II. POTTSTOWN BOROUGH AUTHORITY

A. Management and Finance

1. Project Planning and Management

The JMT team performed onsite inspections of each unit process and reviewed the daily and monthly operating logs with operations staff as part of the existing operating program to determine operational tasks and automation needs. The JMT Team:

- Identified unnecessary/duplicative work
- Identified automation improvements
- Identified if operators could perform light maintenance
- Reviewed Standard Operating Procedures (SOPs)

The JMT team conducted interviews to assess management practices utilizing a five point scale (5 for fully utilized to 1 for not practiced at all) based on the Qualserve ® management Best Practices Index. Borough of Pottstown organizational chart is provided as Appendix C.

Plant management and operations were evaluated through interviews, personal observations and a review of documents provided by the Authority. The resulting assessment was compared to the results of the most recent Qualserve survey, which includes 105 national utilities, conducted jointly by the American Water Works Association (AWWA) and Water Environment Federation (WEF). Further, comparisons were also made against the Qualserve sample and against a grouping of wastewater utilities serving between 10,000 and 50,000 people (the plant's served population is over 35,000). A summary of PBA plant statistics are briefly summarized in Table 1 below:

Table 1 - PBA Wastewater Treatment Plant Summary

Pottstown Borough Authority Plant Statistics Summary	
Item	Result
Plant design capacity	15.6 MGD (12.85 limited organic capacity)
Average daily flow (ADF)	5.091 MGD (2013 Annual Average per Chapter 94 report)
Plant type	Activated Sludge Secondary treatment (No Nutrient Removal, Tertiary, Primary Clarification or Equalization)
Biosolids: Class A or Class B	Indirect Thermal Dryer Centrifuges
Bulk Program	Receive Septage and Outside Waste
Disinfection	Gaseous Chlorine
Population served	Over 35,000 people
Personnel Full Time Equivalents (FTEs)	14 (O&M of WWTP, Water Plant and Pump Stations)

The organizational best practice index is one of the performance measures in Qualserve benchmarking. The benchmarking survey has been conducted every 1 or 2 years since 2002. The original Qualserve performance measures were developed by a large group of water and wastewater professionals, which included some 30 utility general managers and continues to be supported by committees, Water Research Foundation studies and volunteers. The organizational best practice index is designed to show where utilities are on a theoretical scale where 5 indicates full utilization of consensus best practices. It should

be noted that no utility has ever achieved a 5 in every category. However, the index should prove useful in identifying potential improvements. For this computation, the consulting team worked with utility personnel to agree on scores for 7 organizational elements (note: the most recent version of Qualserve benchmarking has added 3 more measures - governance, drought and groundwater protection - which was not included in this exercise). The following paragraphs present for each element, the activities that would constitute a top score, the estimated score for PBA, and the rationale behind the score:

The Best Practice Evaluation evaluates seven elements of utility management. The following list identifies the seven practice areas and identifies the practices examined in this evaluation:

- **Strategic Planning –**Does the plant have a formal strategic plan, performs planning studies and develops budgets on a five year basis?
- **Long term financial plan –** Does the plant utilize a five year financial planning cycle?
- **Risk Management** – Does the Authority have a risk management plan?
- **Asset management –** Does the plant have a complete inventory and asset management plan?
- **Performance measurement –** Does the plant collect data on performance measures, tracked as part of a process to rigorously track performance to form a basis for continuous improvement?
- **Customer Involvement** – Does the plant have a program for customer involvement?
- **Continuous Improvement** – Does the Authority have a continuous improvement program in place?

We rated each category on a scale of 1 to 5 (5 being fully implemented best practices). Note this is a collective and subjective opinion of the JMT team as a whole, based upon out experience and review and observations of PBA. Table 2 below compare the Authority ratings assigned, compared against results from other wastewater Qualserve utilities.

Table 2 - PBA Management Best Practices Comparison

Best Practice Category	Pottstown	All wastewater Qualserve utilities (median)
Strategic Planning	2	4
Long Term Financial Planning	3.5	5
Risk Management	2.5	3
Asset Management	2	4
Performance Measurement	1.5	4
Customer Involvement	4	3
Continuous Improvement	1	2
Total Best Practice Rating	**16.5**	**25**

Note: Qualserve did not break out scores by population served, however, in past years smaller utilities typically scored 2 to 4 points lower.

a) Strategic Planning

Fully implemented strategic planning best practices would include:

- A strategic plan consisting of Vision, Mission, Values, Goals, Objectives, Tasks and Implementation strategy developed using a SWOT (strengths, weaknesses, opportunities, threats) analysis, or similar analysis.
- Performance measures which allow the evaluation of the achievement of the strategic plan
- Goal teams that monitor plan progress, evaluate and redirect strategy
- Regular monitoring, review and updating of the plan
- A 5 year capital plan

On a 1 to 5 scale, PBA was rated a 2 based on the following:

A capital planning committee that regularly checks progress against the plan and makes adjustments to the plan as necessary, however, CIP is weak as it does not indicate projected costs nor justification behind or for each project.

The PBA 5 year capital plan is provided as Appendix F. A more comprehensive strategic planning effort would include CIP improvements and other plan elements such as personnel, technology and have wider employee participation in the planning and monitoring effort. PBA Capital Plan is limited and does not document project justification.

b) Long Term Financial Planning

Fully implemented financial planning best practices would include:

- Long term (some go out 20 years) financial plan that incorporates operating costs, capital costs and demand projections
- Target financial metrics for such measures as reserve levels, debt service coverage, debt ratios etc.
- Rate impacts reviewed in making financial decisions
- Cost-benefit analysis used in making financial decisions
- Financial controls including controls on spending
- Regular reviews and updates to financial plans

Based upon a 1 to 5 scale (5 being fully implemented best practices), PBA was rated a 3.5 based on the following:

- Five year planning horizon
- Rates projected out to 5 years
- Integration of CAPEX (capital expenditures) and OPEX (operating expenditures)
- Rate impacts informs spending decisions
- Control on spending
- Financial goal - eliminate debt

Possible additions to financial planning could include additional metrics and additional goals, incorporation of demand into modeling effort and additional cost-benefit analysis.

c) Risk Management

Fully implemented risk management best practices would include a process for identifying potential risks to the utility within the context of the strategic plan and for developing plans to mitigate physical and financial loss, including:

- Disaster readiness planning
- Security program for resources, facilities and service delivery systems
- Health and safety programs for employees and the general public
- Public liability exposure
- Emergency operating planning
- Hazardous material contingency planning
- Insurance procurement (or alternative self-insurance) including property and casualty insurance, health and worker's compensation insurance and liability insurance

On a 1 to 5 scale, PBA was rated a 2.5 based on the following:

- Existence of reserve (a form of self-insurance accounts)
- Insurance programs

- Security assessment with planned actions at the plant to improve security.

A more comprehensive risk management effort would include completion of the security program at the plant, reduced use (or more security for) hazardous materials at the plant, and health and safety programs for employees (employee days lost is high compared to Qualserve utilities). A vulnerability discussion was held in 2006. A detailed plan was prepared but never implemented.

d) Performance Measurement

Fully implemented performance measurement best practices would include:

- A fully developed set of performance measures that identify successful performance and achievement of strategic goals in every aspect of utility operations
- Regular review of actual performance against performance measure targets (some utilities do this monthly)
- Analysis of failure to meet performance targets using such tools as root cause analysis and taking corrective action
- Revising and updating performance measures (such as setting the bar higher as best practices are implemented)

On a 1 to 5 scale, PBA was rated a 1 trending to 1.5 based on limited identification of key performance measures, limited review of performance and limited updating. (Note: samples of performance measurement reports of other utilities have been provided to PBA. We have also arranged for PBA to be included in the next Qualserve effort which will provide PBA with performance measures and benchmarking information. That information and the performance measures utilized in this evaluation can be used to implement a performance measurement system).

e) Asset Management

The plant manager and key plant personnel have intimate knowledge of the plant and its components. As a result, key capital decisions are made intuitively, i.e., based on the experience and knowledge of plant components. The current practice in wastewater plant management, and one that is strongly endorsed by the US EPA, is to arrive at Capital Improvements Program decisions through a formal asset management process. Asset management includes a detailed asset inventory, regular condition assessments and analysis to optimize asset management. A simplified asset management program would bring rigor to such decisions as repair and/or rehabilitate (R&R) versus replacement, whether asset improvements are expenses or capital improvements. Conversely, the lack of one may result in improper working equipment being allowed to go out of warranty without repairs being requested.

Fully implemented and optimized asset management best practices would include:

- A complete inventory of infrastructure assets in GIS including materials and in service date
- Regular condition assessment for all asset classes
- Replacement cycles for each asset class (or other method, such as condition, to determine replacement need)
- Assessments of the financial impacts of both maintenance and replacement of assets (repair vs. replace tradeoff)
- Life cycle costing to support major asset decisions
- Integrated use of data from multiple sources, such as GIS and MMS to support decisions with the purpose of lowering capital costs
- Communication with elected officials, customers and the general public

On a 1 to 5 scale, PBA was rated a 2. Although knowledge regarding assets exists within the utility it is insufficiently documented. Because the knowledge rests with so few people (some of whom are close to

retirement age) there are some potential knowledge management issues. The utility could benefit from implementation of automated systems. Appendix H provides benchmarking definitions and terminology.

f) Customer Involvement

The Qualserve program addresses both retail and wholesale customers. Elements of customer involvement best practices include:

- A formal program for relating with customers in a way that assures they understand and participate effectively in the utility management process
- Conducting customer satisfaction surveys and responding to what is learned
- Soliciting input on projects and programs under consideration, in planning, or under construction
- Identifying and confirming customer priorities both in terms of topic and breadth and degree of concern
- Resolving customer issues and complaints
- Offering educational programs and materials and assessing their effectiveness

With respect to wholesale customers, PBA is rated as a 4 for the following reasons:

- This study (which has sought wholesale customer input) is a form of customer satisfaction survey
- Monthly meetings and reports to wholesale customers
- Regular solicitation of input from Townships

g) Continuous Improvement (CI)

Fully implemented and optimized continuous improvement best practices would consist of a program which includes one or more of the following suite of systems that are aligned with utility goals:

- ISO 9000 series or ISO 14001, which is a new industry standard
- Environmental management systems
- Work process documentation programs
- Self assessments, peer reviews and benchmarking such as those offered through Qualserve
- Pursuing association or other quality award programs, such as National Biosolids Partnership, NACWA Gold etc.

Since PBA has no formal CI program, the Authority scored a 1 in this category. There are some improvement efforts in the areas of energy and Human Resources.

In addition, our Team evaluated the Authority's current program and its effectiveness to determine if it provides opportunities for cost savings for plant operations. In addition, we recommend operating software that could provide a cost savings to the Authority.

During onsite inspection at the plant; we examined each position and analyzed their respective roles and responsibilities and reported efficiencies or inefficiencies, to determine if an increase or decrease in staffing is necessary for immediate or long term needs. As our team observed and interviewed the Authority's employees, we also determined if there was any duplication of work effort being performed that does not add value and made recommendations based upon our findings.

We utilized the comparison of interviews against self-assessments by other utilities surveyed in the Qualserve program to identify opportunities for continuous improvement: reporting asset management and risk management. For example, the effectiveness review consists of developing and comparing metrics in the following Qualserve areas:

- Health and Safety – the Health and Safety Index is 200,000 x (Total Days Away From Work) / (Total hours worked by all employees)
- Training hours per full time equivalent (FTE)

- Million gallons per day (MGD) of wastewater processed per employee
- Average bill and bill affordability
- Wastewater treatment effectiveness rate – this is defined as 100 x (365 – total number of non-compliance days)/365
- Planned maintenance ratio – defined as 100 x (Hours of planned Maintenance) / (Hours of planned + corrective maintenance)
- Operations and maintenance costs per MG processed

As noted in Section 1, we compared PBA to a sample of similar Pennsylvania wastewater utilities. Appendix K includes benchmarking forms and information gathered from the local utilities. JMT contacted those local PA utilities to compare them against PBA in terms of capacity size, process units, staffing levels, etc.. From a budgetary standpoint, Table 3 summarizes the metrics and comparison to the local Eastern PA utilities. Average Daily Flow (ADF) is expressed in terms of million gallons per day (MGD) and FTE translates to full time equivalents.

Table 3
Benchmarking Comparison – Staff and Budget (Local)

Utility	ADF	Total FTE	Tot FTE/ADF	Ops FTE	OpsFTE/ ADF	Revenues	Rev/ADF	Expenses	Exp/ADF
PBA	5.95	14	2.35	8	1.34	7.9	1.33	3.8	.75
Derry Township	3.75	32	8.53	15	4.00	8.75	2.33	5.66	1.51
Downingtown	6	Contract Operated			.	3.9	0.65		.
Wyomissing	2.54	9	3.54	7	2.76	2.61	1.03	1.46	0.57
LASA	9.5	29	3.05	11	1.16				
Exeter	4.7	14	2.98	10	2.13	5.3	1.12	5.17	1.099
Valley Forge	7	20	2.86	15	2.14	3.2	0.46	3.16	0.45

A second comparison was made to similar plants in touching states as shown in table 4 below:

Table 4
Benchmarking Comparison – Staff and Budget (Touching States)

Name	No. of Plants	Type	Design Capacity	ADF	Treatment FTEs	Total OpEx	TOE/ADF	Treat FTE/ADF
Stony Brook Regional Sewer Authority, NJ	3	Advanced Secondary	13.6	9.7	33	10,133,000	1,044,639	3.40
Great Neck WPCD, NY	1	Advanced Secondary	3.8	2.5	5	3,911,093	1,564,437	2.00
Lebanon OH	1	Secondary	6	2.6	4	did not report		1.54
Delaware County RWQCA	1	Secondary	50	36.7	6	36,270,71	988,303	Not comparable
Pottstown	1	Secondary	15	7.7	8	5,865,129	765,983	1.04

Note: Delcora has since acquired a second plant
Legend
ADF – Average Daily Flow
FTE – Full Time Equivalent
REV - Revenue
OPEX – Operating Expense
TOE – Total Operating Expense

The third peer utility group was extracted from the NACWA sample taken from the 2011 survey. These are utilities with an average daily flow between 4.1 and 9.7 MGD. Table 5 below indicates staff and budget data on a National level (we utilized 2011 data for PBA to be consistent with the sample) referencing this database:

Table 5
Benchmarking Comparison – Staff and Budget (National)

	Design Capacity (MGD)	Total Plant Flow (MGD)	Primary[1]	Secondary[1]	Advanced Secondary[1]	Tertiary[1]	Biosolids[1]	Total Plants	Total Operating Expenses	Administration & Overhead	Collection Systems	Treatment
PBA	15.6	7.7			1				5,865,129			4,054,203
City of Greeley	14.7	7.9			1				4,386,680	838,024	878,602	2,670,046
Aurora, City of, CO	5	4.7				1			25,445,743			
City of Pocatello WPCD	12	6.9			1				4,734,798			
City of Olathe	13.9	6.7							9,998,112	3,446,261	1,489,372	5,062,479
Oakland County WRC	12	4.2				2			113,931,418		94,942,334	18,989,084
Orange WSA	14.7	7.5				1			6,563,558	1,757,040	958,945	3,847,573
Stony Brook Regional SA	13.6	9.7			3				10,133,000	875,000	467,000	6,008,000
City of Albany	68	9		1					7,422,405	2,853,453	1,826,812	2,078,824
Gulf Coast Waste Disp. Auth.	9.3	5.2				1			1,448,080			
Upper Trinity Reg. Water Dist.	7.9	5.3				3			3,228,174	695,250		2,532,924
Central Davis Sewer District	9.9	6.1		1					2,523,386		908,641	1,614,745
Snyderville Basin WRD	6	4.1				2			5,651,176	1,674,345	1,122,590	2,456,467

Notes:
Total OpEx/ADF for 12 utilities is $2,528,674
Total OpEx/ADF for PBA in 2011 was $765,983
Total OpEx/ADF for 2 utilities with secondary plants was $658,662
PBA had extraordinary expenses in the plant in 2011, if they were at budget TOE/ADF would have been $635,383

It should also be noted that 2013 plant expenses were significantly lower, improving their cost ranking within this group.

Table 6 summarizes values calculated for the plant compared to median values for wastewater Qualserve utilities and identifies the quartile for the plant's value (in quartile rankings, 1st quartile is better than the 2nd quartile, 2nd is better than 3rd and 3rd is better than the 4th.)

Table 6- PBA Qualserver Metric Comparison

Metric	Pottstown	Median Qualserve Utilities	Quartile
Overall Plant Management			
Management Best Practices	16.5	25 (calculated)	4
Organization Development			
Training Hours per FTE	80	23	1
MGD processed/FTE	0.36	0.23	2
Customer Relations			
Bill Affordability	1%	0.63%	4
Wastewater Operations			
W/W Treatment Effectiveness	100%	100%	1
O&M cost per MG processed	$2,181	$2,399	2

Bill affordability is average bill divided by median household income, so affordability is strongly affected by a factor outside of the control of the utility. Qualserve has stopped reporting the Employee Health and Safety Index. Based on previous Qualserve surveys, Pottstown would not have compared well. The following section discusses Workman's Compensation and employee illnesses in more detail.

In evaluating the results of this comparison, the focus should be more on relative position than focusing on a precise number. In addition, comparisons are better made to similarly sized utilities with similar treatment levels.

2. Purchasing Procedures

Our review of purchasing procedures included:

- Reviewed purchasing procedures both through a review of documentation and interviews (to identify informal procedures) with Authority personnel
- Identified if there was sufficient separation of duties
- Reviewed risk management when purchasing materials or services
- Benchmarked materials expense as % of total to gauge purchasing efficiency
- Reviewed solicitation practice to procure quotes: for example, does the Authority require at least three quotes for a given product? (Polymer, chemicals, lab equipment, etc.)

PBA follows the Borough of Pottstown's purchasing policy, which follows the purchasing rules of Pennsylvania Municipal Authorities (Municipal Authorities Act 53Pa.C.S.Ch.56).

There are a graduated series of approvals for invoices based on invoice amount:

- From $0 to $1,499- Department Head must approve
- From $1,500 to $5,000 – reviewed verbally with Borough Manager in advance, approval on invoice by Department Head and Borough Manager

Requisitions and Purchase Orders (PO) are needed above $5,000 pursuant to the following thresholds:

- $5,001 to $9,999 – requisition and PO dated prior to purchase approved by Borough Manager
- $10,000 to $18,000 – requisition and PO dated prior to purchase approved by Borough Manager and the required documented phone quotes

- Over $18,001 – requisition and PO dated prior to purchase on any dollar amount when purchase is going over approved budget line item, after mid-year adjustments are approved in August. Mid-year adjustments shift dollars but cannot result in overall increase to budget.
- Over $18,900 – Public bidding is required
- Exceeding budget – requisition and PO dated prior to purchase on any dollar amount when purchase is going over approved budget line item, after mid-year adjustments are approved in August. Mid-year adjustments shift dollars but cannot result in overall increase to budget.

Repetitive purchases (chemicals etc.):

- Issue blanket PO at the beginning of year and re-use the same PO throughout year for repetitive purchases

The above requirements do not apply to:

- Emergencies
- Cost of utilities i.e., electric gas, fuel, phone etc.
- Automotive repairs

PBA follows typical purchasing procedures, is a member of the COSTAR purchasing pool, and has separation of duties as a control measure. There were no negative comments regarding purchasing procedures in audits which tests randomly selected transactions for compliance. So all indications are that PBA is following proper procurement procedures. Cost ratios reported elsewhere in this report are not indicative of control failures in purchasing.

3. Sewer Service Agreement

JMT reviewed the "Sewage Treatment Service Agreement" (agreement) and compared it to common practice for arrangements involving a publicly owned treatment works (POTW) providing wholesale wastewater treatment services to surrounding municipalities. Interviews were conducted with the Authority staff and each Township Manager to identify how the agreement is actually being implemented. Our scope of work included a review only of the existing agreement and does not include the development of a new agreement. JMT suggests renegotiating and updating the existing sewer service agreement.

Per the agreement, each municipality contributes a base rate based upon their "requested" capacity as a function of their metered flow and usage. In the event the flow exceeds the requested capacity, then a surcharge is incurred. For example, ***"each municipality discharging sewage in excess of its requested capacity shall pay the amount obtained by dividing the total debt service and coverage applicable to the plant for the applicable calendar year by the total requested capacity of all municipalities resulting in the debt service per MGD, and multiplying that figure by the total of the excess sewage deemed to be discharged by the lessee municipality during such Calendar year, and multiplying the product by two (2) (Capital Cost Recovery Factor), illustrated as follows (LM = Lessee Municipality):"***

Table 7 presents a hypothetical example of typical charges as taken from the Sewage Treatment Service Agreement:

Table 7- PBA; Sewer Service Agreement Example

	Average Daily Sewage Discharged by LM During Calendar Month		**.90 MGD**
-	Requested Capacity of LM	-	.80 MGD
=	**Capacity Rented by LM For Entire Year**	=	**.10 MGD**
	Annual Debt Service and Coverage For Treatment Plant		$2,400,000
/	Total Requested Capacity of All Municipalities in Treatment Plant	/	15.60 MGD
=	**Debt Service Per MGD**	=	**$153,846/MGD**
	Debt Service Per MGD		$153,846/MGD
x	Capacity Rented by LM For Entire Year	x	.10 MGD
=	**Debt Service Attributable to Rented Capacity**	=	**$15,385**
	Debt Service Attributable to Rented Capacity		$15,385
x	2 (Capital Cost Recovery Factor)	x	2
=	**Annual Rental Payable by LM to Lessor Municipality**	=	**$30,770**

The 1972 Clean Water Act (CWA) Amendments contained a number of provisions which resulted in the designation of a central Publicly Owned Treatment Works (POTW), such as the one owned and operated by PBA, receiving and treating the wastewater from surrounding municipalities. There are numerous similar situations throughout Pennsylvania and the United States. Most of these utilize agreements to determine how capacity will be allocated, how rates will be set, how various CWA requirements will be enforced etc. These agreements include the following elements:

- Allocation of capacity
- Cost allocation – typically capital costs are allocated based on reserved capacity, and operations and maintenance (O&M) costs are allocated based on flows
- Penalties for underestimating capacity needed (to prevent gaming the system)
- Definitions
- Details on metering to support the allocation of O&M costs – who owns the meters, who reads them, calculating flows, estimating procedures if there are meter problems etc.
- The pass down (from the POTW to the municipal customers) of certain regulatory requirements – mandatory connection ordinances, user charge ordinances, enforcement mechanisms etc.

Each tributary system has purchased a Maximum Three Month Daily Average Flow (Requested Capacity) as their portion of the 15.6 MGD total that they are allowed to convey to the WWTP without incurring a penalty. Table 8 below provides the current allocated or requested capacity for each municipality along with average and peak daily flow (MGD) as taken directly from the request for proposal.

Table 8

Borough and Townships, Allocated Capacity Data

	Requested Capacity (mgd)	Average Daily Flow (mgd)	Peak Daily Flow (mgd)
Pottstown	9.2974	2.725	12.53
Lower Pottsgrove	4.1	1.362	9.978
Upper Pottsgrove	0.6026	0.468	1.711
West Pottsgrove	1.6	0.535	2.108

The Sewage Treatment Service Agreement entered into by PBA, the Borough and the Townships is a very detailed agreement, which addresses the areas covered by most agreements, including all of the above. It appears that there were some negotiations prior to signing the agreement, so we assume that all signatories were familiar with the document at the time they agreed to the agreement provisions.

During our interviews, a number of complaints were raised regarding the agreement:

- The penalty provisions regarding excess flows were too severe
- The Townships should have more say in decisions involving the POTW
- Administrative costs are too high
- Concerns about the bills (primarily meter related)

Each is discussed below:

a) Penalty Provision

As we have noted, all similar agreements have some penalty provision to guard against underestimating capacity required by dischargers. The two penalty provisions (capacity and excess flows) may be more severe than found in other agreements, but it was entered into by the signatories. If these provisions have turned out to have unintended consequences, the remedy would be to review the entire agreement or to request amendments to the problematic provisions.

Alternatively mandating corrective expenditures would be similar to the approach EPA has been taking with regards to its issuance of Consent Decrees and could be considered in a revisit to the agreement. However, this approach is not without its potential problems – how will we know if the money is being spent efficiently and appropriately; what if the money is spent and I/I doesn't decrease? Mandating I/I expenditures is also problematic because it is very difficult to assess the value of expenditures.

The level of penalties are likely the result of local conditions at the time the agreement were negotiated. There has been a significant passage of time and current local conditions warrant revisions and amendments to the agreement, including penalties. Comparing other penalties at other utilities would be of questionable use since each agreement is different, based upon local conditions.

Penalty provisions are common in inter-municipal agreements with regards to capital allocations, which level the economic playing field among the various parties involved (i.e., eliminate "free riding"). The penalty provisions in different agreements tend to reflect conditions and expectations regarding capacity available, future growth demands, and relative competitive position of the signatories at the time of the agreement. As a result, penalty provisions vary because local conditions vary. As a result, we see little benefit in comparing penalty provisions to other agreements where available capacity, growth expectations and competitive pressures are different. If signatories to the agreement feel that changes should be made to the penalty provisions, they should be addressed as part of a review and update of the agreement, which we support and recommend.

Since penalties are assessed because capacity has been used which was not leased, penalty payments should be used to offset capital payments, reimbursing those whose capacity has been used by the over-allocated party. Section 4.02 implies the sequence in which such funds are to be used - the Borough first, and then the remaining Townships. This sequence of application of funds is also the understanding of the Borough; however, in the case of the UPT penalty payments went into the Sewer Capital Fund and applied to the acquisition of a siphon which benefited UPT, which participated in the decision to do so.

b) More Involvement in POTW Decisions

In prior years there were concerns about the amount and timing of information provided to the townships, however, this has improved recently with the implementation of monthly meetings. We have reviewed the agendas for those meetings and they appear to be appropriate (a following section on budgeting contains a recommendation that would improve the timeliness of some of the information provided to the townships). The townships appear to be satisfied with the monthly meetings. Other systems have implemented a number of methods to involve wholesale customers. These include regular meetings, advisory boards or committees, and similar mechanisms. For instance, in the Washington, DC area (there are multiple POTWS), it is not unusual to find municipal dischargers reviewing CIPs and sitting in on contractor selection boards. However, in those cases, as is the case in Pottstown, there is only one NPDES permittee and the responsible party on the permit is the owner, who is ultimately liable for any noncompliance issues at the plant. In other inter-municipal agreements, some large municipal dischargers may sit on advisory boards; however, we know of no instances where there is a single owner POTW that does not have a majority vote.

While the Townships have made significant financial contributions to PBA for both capital improvements and O&M services, making financial contributions does not convey ownership, which has been argued unsuccessfully before by other wholesale customers.

As a result of the '72 Clean Water Act, there are many situations similar to Pottstown's - a central POTW with neighboring municipalities discharging to the plant. As would be expected, there are a variety of organizational arrangements which provide for input by the discharging municipalities. These include Board membership, advisory committees and other arrangements, such as participation in contractor selection etc. We are not aware of any single owner POTW (such as is the case in Pottstown) that has an arrangement where the owner has a minority vote. However, the POTW owner should properly inform and receive input from municipal dischargers and these large customers are entitled to provide input. If one or more municipal dischargers feel that their input is not being constructively accepted, they could pursue a revised agreement (we support revisiting the agreement), or a transition to an arrangement that provides for more input such as forming a joint sewer authority. Ultimately, if one or more Townships feel that unilateral capital expenditure and priority decisions are resulting in discriminatory or inequitable rates, as a last resort, they can pursue litigation to remedy that situation.

The current agreement was performed over 10 years ago. We recognize that the Townships, including Upper Pottsgrove Township, had little leverage in entering into the agreement since connection to PBA was mandatory by the PaDEP. However, numerous municipalities in the United States have found ways to achieve satisfactory agreements with limited leverage. Preparing a new sewer agreement is outside of this scope of work and we do recommend preparing a new agreement or modifying the existing agreement. In any renegotiation of an agreement, we would expect that each party would have its own analyst and attorney representing them in the process.

c) Administrative Costs Are Too High

All operating organizations have general and administrative costs. In situations, such as Pottstown, where the POTW is supported by the Borough, it is typical to utilize an allocation methodology to allocate those costs. The November 7, 2009 agreement between PBA and the Township of West Pottsgrove identifies in detail how indirect costs will be allocated (pages 2, 3 and 4 describing how section 6.02 will be amended). The allocations do not appear to be unreasonable. As a check, we benchmarked administrative costs as a percentage of total costs against eight other POTWS with average daily flows similar to PBA (4 to 9.7 MGD ADF) and found PBA's admin percentage to be about average within this peer group (22% vs. 21% for the average).

With regards to distribution of Pottstown Borough executive costs between sewer collection and the WWTP, executive costs were not allocated to sewer collection in FY2013. We would recommend that an indirect cost study be performed either concurrently with or pursuant to a new sewer agreement to update indirect costs. Although we have not done an indirect cost study, we would not be surprised to see a result, which allocates a higher level of indirect costs to the WWTP. PBA currently allocates over 50% of indirect costs to water.

d) Bill Preparation

The agreement's procedures for meters, meter reading and bill preparation are described in Section 4.03:

- Meters are owned and installed by the Townships
- The flow calculation is performed by the Consulting Engineer, who flags questionable readings and informs the Townships accordingly
- The Consulting Engineer then estimates flows in those situations where there are questionable flows.
- The Enterprise system was implemented in June and should reduce concerns regarding meter readings.

4. Budgeting and Financial Procedures

In reviewing budgeting and financial procedures, the JMT Team:

- Reviewed current budget development and approval procedures
- Identified how budgets are used to track expenditures
- Identified how corrective actions are taken utilizing the budget and review process
- Discussed frequency of budget adjustment in line with real expenditures
- Calculated cost distribution for major cost categories – computed unit costs (i.e.$/MGD)
- Compared cost percentages to peer utilities
- Reviewed "The Sewage Treatment Service agreement" to identify cost/revenue allocation methodology
- Reviewed accuracy of billings (compared to agreements) for the past 3 years
- Reviewed fees and charges to identify revenue opportunities; identified other revenue opportunities
- Reviewed and discussed institutional arrangements within agreements and identified alternatives

PBA utilizes a structured process for budget preparation typified by the following proposed budget schedule for 2015. Appendix I provides the Borough's 2013 budget for reference. In addition, Appendix J presents the Borough's balance sheet, revenues and expenses.

In late summer, Finance sends out actuals to date and 2 prior full years of cost data to department heads. WWTP budget is a joint effort of Finance and the plant manager, with Finance focusing on the revenue projections and the plant manager focusing on expenses. The remaining schedule is presented below:

09/19/14 – Receive budget projections from department heads for Finance compilation

10/01/14 – Present draft to manager

10/08/14 – Budget Finance Committee meeting

10/13/14 – Special Budget Finance Committee meeting

10/29/14 – Review with Manager and department heads, as necessary

11/05/14 – Present Final Budget to Finance Committee

11/05/14 – Power point presentation to Committee of the Whole

11/11/14 – Council advertises for adoption of proposed and advertised budget given final adoption

There is a mid-year review during which budget to actual performance is reviewed. At this time money can be shifted between line items but the bottom line is not increased.

A review of budget to actual performance during the years 2010 to 2012 reveals some sizeable budget to actual differences. Bulk sewer collections experience some sizable differences (20 to 42%) as did total plant expenses (22.5% in 2011 and 16% in 2012). Differences in weather related items should be expected; however, large budget to actual variances can be a problem with entities, such as the Townships, that have small budgets to begin with. Some of these high variances were also due to unexpected equipment failures. Variance performance has improved recently, but this more room for improved through the use of asset management systems, performance management and use of reserves as a rate stabilization measure. The discussion of Management Best Practices (pp7 – 10) describes some of the systems that PBA could consider. PBA believes that reducing budget to actual variances will require more conservative budgets which will, as a consequence, be higher. Appendix E provides the PBA 2013 final reconciliation regarding costs and revenues at the plant comparing budgeted to actuals.

Regarding the budget, the years with significant variations were the ones with the major dryer repairs, which were totally unpredictable. Those expenses were hard to predict because the cause was not identified or fully understood. PBA's practice in the past was to budget worst case scenario. The budget categories with the most frequent overruns were the Repairs to Machinery and Equipment (mostly dryer related) and Sludge hauling (mostly dryer related). PBA is trying to get away from worst case scenario and budget based on a solid operation plan with contingencies built in and then manage to the budget. Another issue in the budget area is the development of reserves and utilizing them to stabilize and level out year to year variations. The Borough has established reserves. Furthermore, when PBA makes cash flow projections for capital programs, they establish and operating reserve level and assume a need to maintain cash reserves of 20% of operating budget. In addition, West Pottsgrove, has implemented an aggressive rate management program, which included a capital improvement fund for the sewer plant and I/I.

The Sewage Treatment Service Agreement introduces some unintended consequences for the Townships. As PBA is developing a future budget, it is required to provide the Townships, on or before October 1, an estimate of next year's costs "based on actual costs for the Township over the prior consecutive twelve (12) month time period." It is inevitable that the PBA budget and the Township budgets will be different

since the PBA budget is forward looking and the information provided to the Townships is backward looking. Finance tries to ameliorate this situation with the subsequent budget estimates that include estimated ranges. During the year, monthly meetings are held with and reports are provided to the Townships.

The JMT team looked for ways to improve the budgeting process. The plant manager and key plant personnel have intimate knowledge of the plant and its components. As a result, key capital decisions are made intuitively, i.e., based on the experience with and knowledge of plant components. The current practice in wastewater plant management, and one that is strongly endorsed by the US EPA, is to arrive at Capital Improvements Program decisions through a formal asset management process, which includes a detailed asset inventory, regular condition assessments and analysis to optimize asset management. Referring back to the Management Best Practices evaluation presented previously, PBA is well behind other wastewater utilities in implementing asset management.

In summary, the process of developing the budget is a structured process, which includes appropriate levels of review (given the size of the organization) and public notice prior to adoption. There are some improvements to the process that could be considered (such as establishing financial targets and performance metrics) and are discussed in more detail in the Organizational Best Practice discussion. Some additional improvements to consider:

- Modifying Section 7.01 of the Sewage Treatment Service Agreement
- Developing reserves and using them to stabilize and level out year to year variations in budget to actual
- Implementing an Asset Management program

As part of our financial procedures evaluation, we computed the cost distribution for 9 wastewater utilities (ADF 4.7 MGD to 9.7 MGD) to compare cost distributions. These were utilities with comparably small distribution systems. Table 9 presents the cost distribution as follows for PBA against peer utilities:

Table 9
PBA Cost Distributions

Item	Cost Distribution 9 Peer Utilities	PBA
Wages and Salary	24%	21%
Benefits	10%	7%
Chemicals	4%	9%
Electric Power	9%	15%
Other utilities	23%	11%
Supplies and Materials	5%	7%
Miscellaneous	25%	30%

The above table demonstrates the relatively high percentages relative to chemicals (9%) and electric power (15%). The peer utilities do not necessarily have the same process units as Pottstown so there is no perfect "apples to apples" comparison. For example, Lancaster Area Sewer Authority (LASA) is similar to Pottstown in terms of capacity (15 MGD design); however, does not have digesters nor a dryer but is planning to have them in 2015. Exeter Township is similar to Pottstown as far as process units (centrifuges, digesters, dryer, etc.); however, its plant is only rated at 7.1 MGD as a design capacity. In addition we analyzed costs for the past 4 years and calculated unit costs (i.e., on an MGD basis). Table 10 presents unit cost computations. With the exception of treatment plant costs, which vary as equipment problems crop up, cost patterns do not appear to be unusual.

Table 10 below provides unit costs for each expense under the Borough that were calculated for the 2010-2013 timeframe:

Table 10
PBA Unit Cost Financial Data

Item	2010	Unit Costs	2011	Unit Costs	2012	Unit Costs	2013	Unit Costs
Total Fund Revenue	8,694,284		8,145,665		9,602,740		8,520,302	
Legislation-Council	12,932	2,537	9,812	1,281	11,622	2,279	11,293	1,898
Exec-Manager	50,236	9,854	46,883	6,123	47,601	9,334	51,355	8,631
Finance	209,525	41,099	194,331	25,380	181,634	35,615	191,204	32,135
Legal	30,089	5,902	26,436	3,453	17,166	3,366	30,512	5,128
Human Resources	29,998	5,884	30,977	4,046	33,832	6,634	36,078	6,064
IT-Web Network Svcs	62,935	12,345	84,706	11,063	85,708	16,805	57,932	9,736
Engineering	47,148	9,248	43,053	5,623	44,359	8,698	97,031	16,308
General Gov Building	15,129	2,968	21,214	2,771	21,394	4,195	34,231	5,753
WasteWater Treatment	3,324,370	652,093	4,054,203	529,477	5,031,803	986,628	2,936,934	493,602
Public Works	8,202	1,609	4,586	599	10,175	1,995	6,136	1,031
Debt Service	2,886,778	566,257	2,999,089	391,679	2,848,702	558,569	2,896,984	486,888
Depreciation	75,177	14,746	70,164	9,163	60,948	11,951	50,783	8,535
Miscellaneous	(152,856)	(29,984)	5,865	766	11,056	2,168	9,823	1,651
Insurances	73,745	14,465	58,351	7,621	62,430	12,241	54,758	9,203
Health & Other Benefits	304,491	59,728	250,164	32,671	235,560	46,188	242,608	40,774
Shared Employee Benefits	65,772	12,902	68,248	8,913	66,721	13,083	75,087	12,620
Refunds	2,470	485	300	39	451	5	(235)	(39)
Total Exp	7,046,141		7,968,382		8,771,162	1,719,836	6,782,514	1,139,918
Chapter 94 ADF	5.098		7.657		5.1		5.95	

Note: Does not include interfund transfers

5. Sewer Rates and Affordability

In August 2013, the Authority board voted to request the council adopt an increase of $5 per quarter for the base rate, and an additional 20 cents per 100 cubic feet of water used. The increase works out to about $30 per year for the average household and comes on top of an identical increase approved by borough council in July 2012. When combined with the increase council approved last year, the requested increase would bring the average homeowner's bill from $99.70 in 2011 to $115.70, an increase of 8 percent per year.

PBA is in the middle on rates when compared to other Pennsylvania wastewater systems. Another way to evaluate rates is to look at rate affordability (average annual bill divided by median household income). Affordability is one criteria US EPA looks at when evaluating new regulations and when negotiating

consent decrees. PBA rate affordability is 1%, well below the threshold for unaffordability, but above the Qualserve median of 0.63% (Qualserve contains many larger utilities).

6. Staff Assignments, Compensation and Allocations

We scheduled a series of interviews and site visits with various utility workers, system supervisors, and management personnel to determine staff assignments. The Borough of Pottstown organizational chart is provided as Appendix C. Under the supervision of the Borough Manager, the Utilities Director manages wastewater plant and pump station operations (as well as water plant operations) and the Director of Public Works manages streets and sanitary collection and water distribution systems operations. We met with those managers and the key objectives of the interviews were to gather information pertaining to both operational tasks and staffing issues:

- Gain insight into job responsibilities, operational practices, process constraints and technology utilization. The interviews were used to verify survey results as well as to identify any "undocumented" practices and procedures.
- Determined Authority's existing and targeted levels of service for various operational tasks.
- Determined staffing assignments and schedules, and service area coverage logistics.
- Differentiate between Utilities and Public Works Departments.

The key elements of our approach included:

- An "objective" evaluation of practices and staffing levels utilizing a "forward-looking" approach to identify areas of improvements.
- Adopting a collaborative work approach with Authority's staff, when executing various tasks including gathering data, designing and conducting staff survey, and identifying peer utilities.
- Leveraging existing resources such as our benchmarking database and an associated best practices library that maximizes our ability to assist.

The main objectives of this task were to evaluate existing staffing workload, distribution of Full-time Equivalents (FTEs) across functional areas and location, alignment of staffing with service level needs and projections, and overall adequacy of staffing resources. Key elements included:

a) Identification of staff responsibilities and factors unique to authority
Through interviews, and review of job description documentation, we determined the major day-to-day and off-routine job responsibilities of the various utility workers and supervisors. During this task, we observed major shifts in responsibilities due to the transition to the standard day/night shift schedule. We observed the transition during the night shift to the day shift in the morning as well.

b) Evaluated staffing workload
We developed benchmark data which related to staffing levels given the various factors that the Authority presents – a low to average growth rate with a declining industrial base. In addition to our field observations and interviews, we reviewed work order information to take a look at distribution of work activities across shifts, including the protocol by which PBA receives Septage and outside waste.

As an early step, we formed a peer utility group consisting of 12 utilities with an average daily flow (ADF) between 4.1 and 9.7 MGD (for the past 4 years, PBA's ADF has ranged between 5.1 and 7.7). We then allocated PBA staff to different functions in order to allow comparison to the peer utilities-

- Since most of the peer utilities manage collection systems we included collection system personnel
- Personnel allocated to treatment contain only operators and maintenance personnel
- Pump station maintenance is included in collections (as the peer utilities do)

We broke down staffing levels by department, then compared PBA to utilities on a national scale. Note Local utilities data is not available at this level of detail. Table 11 presents benchmarking staff data on a National scale:

Table 11

Benchmarking Staffing Breakdown (National)

	Design Capacity (MGD)	Total Plant Flow (MGD)	Secondary[1]	Advanced Secondary[1]	Tertiary[1]	Administration	Collection Systems	Industrial Pretreatment	Treatment	Water Reuse	Biosolids	TOTAL	Tot FTE/ADF	Treat FTE/ADF
PBA	15.6	7.7		1		2	2	1	8.0		1	14.0	1.83	1.04
City of Greeley, CO	14.7	7.9		1		3.3	14.0	3.0	20.0			40.3	5.10	2.53
City of Ames, IA	8.6	7.2		1		9.5	3.6		15.0			28.1	3.90	2.08
City of Pocatello WPCD, ID	12	6.9		1		6.0	5.0	3.0	8.0		4.0	26.0	3.77	1.16
City of Olathe, KS	13.9	6.7					14.0	0.5	13.5		1.0	29.0	4.33	2.01
Oakland County WRC, MI	12	4.2			2				14.0			14.0	3.33	3.33
Orange WSA, NC	14.7	7.5			1	22.0	14.0		18.5		4.0	58.5	7.80	2.47
Stony Brook Regional SA, NJ	13.6	9.7		3		5	0.5	0.5	33		7	46	4.74	3.40
City of Albany, OR	68	9	1			3.0	8.0	3.0	7.0		1.0	22.0	2.44	0.78
Gulf Coast Waste Disp. Auth., TX	9.3	5.2			1							6.0	1.15	
Upper Trinity Reg. Water Dist., TX	7.9	5.3			3	2.3	1.5	0.5	6.0	1.0	1.0	12.5	2.36	1.13
Central Davis Sewer District, UT	9.9	6.1	1			3.0	6.0		5.0		2.0	16.0	2.62	0.82
Snyderville Basin WRD, UT	6	4.1			2	12.0	10.0	1.0	12.0		2.0	37.0	9.02	2.93

As can be seen from the last two columns, PBA compares favorably on staffing levels. The only utilities with fewer treatment full time equivalents (FTEs) per average daily flow (ADF) were the two systems that operated only 1 secondary plant. PBA was second lowest in total FTE/ADF, although the utility with a lower total FTE/ADF ratio does not appear to manage a collection system or have pretreatment activities.

c) Defined target staffing

We developed estimates of target staffing based on the staffing benchmarks. Some of the additional factors that we reviewed include:

- Future system growth and its distribution across the service area
- Future supply of workers taking into account retirements and other attrition
- Availability of technology to support best practices
- Availability of training to support redeployment of workers

Although this scope of work for the Authority does not include training program development, we identified training and practices requirements since it would not be appropriate to set target staffing levels without giving staff the tools to operate effectively at those levels.

d) Work schedule

The Borough's staff, under a lease back arrangement, operates the wastewater treatment plant and two offsite pump stations (Memorial Park Road and Circle Progress) with the following fulltime positions:

- Utilities Director
- Assistant Superintendent
- Operations and Maintenance Manager
- Laboratory Supervisor
- 6 Operators
- 2 Mechanics
- 1 Electrician
- 2 Laboratory Technicians

There are no Authority employees and as such, Borough employees operate the wastewater treatment plant pump stations and water treatment plant. Full time equivalents equal 14. A typical work schedule is presented in the following narrative and in Table 12: The Utilities Director, Assistant Superintendent, and the Laboratory Supervisor work the first shift Monday through Friday. The Operations and Maintenance Manager typically works the first shift, but varying days depending on staffing needs for the weekly rotation. The Utilities Director works 60% of his workweek at the wastewater treatment plant and 40% at the water treatment plant. The Laboratory Supervisor splits 50% of her workweek between both treatment plants (water and wastewater). Two Operators work together during each of the three shifts Monday through Wednesday. One Operator works alone during each shift alternating between Thursday and Friday and Saturday and Sunday for complete 24-hour, 365-day coverage of the facility. Two Mechanics and one Electrician work together during the first shift Monday through Friday. The Mechanics and Electrician work at both the water and the wastewater treatment plants as needed. Two Laboratory Technicians work together on the first shift Monday through Wednesday. One analyst works alone during the first shift alternating between Thursday and Friday with Saturday and Sunday for daily analysis of process and regulatory reporting samples. Finally, the Utilities Directory, the Assistant Superintendent, and six Operators manage and operate the wastewater treatment plant. Staffing and responsibilities are as follows:

Utilities Director: The Utilities Director oversees all of the departments, posts his Wastewater Operator's license at the wastewater treatment plant as the Operator in Charge, and oversees or performs the following tasks:

- makes up the weekly work schedule including holidays and vacations,
- updates posted standard operating procedures (SOP's),
- makes all process changes through SOP's and/or verbal communication with the Operators,
- coordinates equipment repair and/or replacement with the Maintenance Manager,
- orders chemicals and supplies, and maintains a workable inventory,
- manages all outside contractors
- prepares and submits timesheets,
- approves, codes and submits all purchase orders,
- manages and oversees the budget with the Finance Director,
- prepares and submits monthly reports to the Borough and Authority,
- attends Borough Authority meetings.

Not only does the Utilities Director manage the day-to-day activities at the wastewater plant, but also oversees the water treatment plant. There is no plant superintendent so the Utilities Director takes on a significant amount of work under his role and responsibilities in our opinion.

Assistant Superintendent: The Assistant Superintendent oversees the treatment process during the absence of the Utilities Directory. The Assistant Superintendent also manages the Liquid Waste Hauling received at the WWTP, the Municipal Industrial Pretreatment Program (MIPP) and the Fats, Oils and Grease Programs performing the following tasks:

- In absence of the Utilities Directory, oversees the staff, operations and maintenance issues, process changes, etc., receives emergency calls or notification of issues, and approves purchases, tracks and codes invoices,
- Oversees laboratory analysis results,
- Oversees the Bulk Waste program that includes liquid hauled waste (municipal sludge, holding tanks, leachate and residential septage) received at the wastewater treatment plant from outside sludge haulers. Subtasks of the bulk program includes:
  - managing the computerized log-in for each sludge hauler,
  - customer service including new customer setup log-in information, manifest receipt, and laboratory analysis,
  - preapproval from sludge haulers for laboratory analysis, percent solids, and random pH testing,
  - oversees invoicing by billing per volume and manages collections,
  - prepares reports directly received from the computerized log-in system
- Manages and monitors the MIPP for the Borough and all three Townships which includes:
  - preparation of an annual EPA report,
  - respond to complaints,
  - enforce non-compliance surcharges,
  - coordinates annual site inspections,
  - schedules quarterly sampling procedures and analysis of eleven industrial users,
  - inspects three MIPP users pretreatment facilities,
  - prepares all paperwork, reports, sample collection and analysis,
- Manages and monitors the FOG (fats, oils, and grease) program from all food producing industries that discharge to the Borough's and Township's collection system that includes:
  - scheduling site inspections three times per week with a Laboratory Analyst,
  - ensures grease traps are emptied with a sludge hauler on a routine basis,
  - works with the Borough's Streets department to ensure interceptors and sewer lines are cleaned as needed,
  - prepares and submits reports

Operators: Each shift consists of a Lead Operator and a Utility Operator, who work together to complete all of the following responsibilities. On Thursdays through Sundays, each shift Operator performs these same tasks alone. A limited computerized SCADA system (50% plant SCADA) provides the Operators with functioning of the equipment, tank levels, and alarm conditions. Video cameras and a television provide quick snap shots of various treatment process units. The Operators perform the following tasks:

- make four rounds during each shift inspecting all of the process units at the treatment plant,
- recording levels, flows, chlorine residuals,
- collect process samples from the influent, effluent, mixed liquor, biosolids thickening, biosolids dewatering, aerobic digesters and take them to the laboratory for analysis,
- make up chemical feed tanks, as needed,
- alternate equipment, as needed,
- monitor and move the dewatered biosolids feeder for each dumpster,
- monitor and move the dried biosolids feeder for each trailer,

- inspect two off-site pump stations and remove debris collected at the bar screen and/or baskets, alternate pumps and log data in a log book,
- post failed equipment discovered during rounds on the work board,
- replace full wheelbarrows, as needed,
- clean all areas, as needed,
- the first shift cleans dog kennels located at the plant site and feeds the dogs,
- enter all process changes, flows, analysis in the log book and on the log sheet.

Table 12 presents, based upon communications with the Utilities Director and staff, a typical work week for plant staff broken down by shift:

Table 12

PBA's WWTF Weekly Work Schedule

Employee	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		
	Shift	Hours	Shift	Hours	Shift	Hours	Shift	Hours	Shift	Hours	Shift	Hours	Shift	Hours	Total
Utilities Director	1st	6	1st	6	1st	6	1st	6	1st	6	Off		Off		30
Assistant Superintendent	1st	8	1st	8	1st	8	1st	8	1st	8	Off		Off		40
Maintenance/Operations Manager	1st	4	1st	4	1st	4	Off		Off		1st	4	1st	4	20
Mechanic 1	1st	8	1st	8	1st	8	1st	8	1st	8	Off		Off		40
Mechanic 2	1st	8	1st	8	1st	8	1st	8	1st	8	Off		Off		40
Electrician	1st	8	1st	8	1st	8	1st	8	1st	8	Off		Off		40
Laboratory Supervisor	1st	6	1st	4	1st	6	1st	6	1st	6	Off		Off		28
Laboratory Technician 1	1st	8	1st	8	1st	8	1st	8	1st	8	Off		Off		40
Laboratory Technician 2	1st	8	1st	8	1st	8	Off	0	Off		1st	8	1st	8	40
Operator 1	1st	8	1st	8	1st	8	1st	8	1st	8	Off		Off		40
Operator 2	1st	8	1st	8	1st	8	Off		Off		1st	8	1st	8	40
Operator 3	2nd	8	2nd	8	2nd	8	2nd	8	2nd	8	Off		Off		40
Operator 4	2nd	8	2nd	8	2nd	8	Off		Off		2nd	8	2nd	8	40
Operator 5	3rd	8	3rd	8	3rd	8	3rd	8	3rd	8	Off		Off		40
Operator 6	3rd	8	3rd	8	3rd	8	Off		Off		3rd	8	3rd	8	40
Total		**112**		**110**		**112**		**76**		**76**		**36**		**36**	

Notes:
Executive Director of Utilities shares his time between WWTF and WTF
Maintenance/Operations Manager shares his time between the WWTF and WTF working various shifts and days based upon need of supervision
Laboratory Supervisor shares time between WWTF and WTF during the week, but works 8 hours/day on weekends
Laboratory Technicians share time
Operator's rotate Thursday & Friday with Saturday and Sunday every other week
All staff is on call to respond to alarm conditions at both the WTF and the WWTF with the Utilities Director as first called
All staff supports the WWTF and the WTF when necessary

e) Compensation

The following is a comparison of two salary surveys against the 2013 salaries paid by PBA. This is a comparison against surveyed salary ranges only and does not take into account other factors such as benefits, seniority levels, time in grade, etc.

In terms of compensation, we referenced the 2013 salary survey as conducted by the Pennsylvania Municipal Authorities Association (PMAA). Appendix G includes the PMAA salary data. Table 13 below provides 2013 PBA salary data compared against the PMAA regions with 16 or more employees, listed as ranges only:

Table 13

PMAA Compensation Ranges

	All Regions 16 or more employees				Comment
Job Position	PBA 2013 Sal	Low	Average	High	
Utilities Director	75,005	68,604	81,254	112,482	Compared to Assistant Executive Director/Manager
Asst. Superintendent	63,398	48,500	60,970	71,929	Compared to Assistant Superintendent
Utilities Administrator	57,554	71,756	76,206	80,658	Compared to Assistant Office/Business Manager
Lab Supervisor	57,387	40,975	57,690	83,512	Compared to Laboratory Chief
Lab Technician	45,510	38,770	45,190	58,926	Compared to Laboratory Technician
WWCollect Supervisor	62,795	52,500	66,187	88,920	Compared to Superintendent of Distribution
Wastewater Treatment Plant Operator I	45,490	37,000	51,682	65,624	Compared to Plant Operator
Wastewater Treatment Plant Operator II	43,368	36,816	45,354	60,000	Compared to Assistant Plant Operator
Operator/Mechanic	46,717	35,342	45,553	57,844	Compared Equipment Operator
Elec/Instru. Tech.	47,923	46,400	57,152	68,000	Compared to Pump Operator

Table 14 presents the PBA 2013 salary data factored against the 2013 American Water Works Association (AWWA) salary ranges.

Table 14

AWWA Compensation Ranges

Job Position	PBA 2013 Sal	2013 AWWA Survey Range	2013 AWWA Mid Point	Comment
Utilities Director	75,005	84,209 to 120,537	98,827	AWWA title - Top O&M Executive
Wastewater Treatment Plant Operator I	45,490	43,078 to 61,358	52,496	
Operator II	43,368	37,497 to 55,142	45,810	

7. Emergency Projects

For this task, we identified and included "categories outside normal parameters" in our evaluation report for a complete and accurate comparison. To understand the plant's performance, we conducted walkthroughs and interviews to identify practices utilized at the plant that are causing potential "abnormal costs." For example, the Authority budgets $340,000 for chemicals, $520,000 for electric and $450,000 for machine and equipment repairs, respectively. Are these reasonable costs for a plant sized at 15.6 MGD and how do they compare to peers in the industry?

We benchmarked the plant by computing the following:

- Burdened cost of treatment per MGD
- Unit staffing levels
- Cost distribution
- Amount processed per employee
- Ratio of planned to unplanned maintenance
- Effectiveness measures – such as compliance rate

We studied previous emergency events at the plant and weighed them from high importance, to medium importance, to low importance. This rating system defined actual emergency events and provided a classification for future emergencies. The first step was to define emergency projects, establish the frequency of each and explain the manner in which they were addressed from an operations standpoint.

The Lead Operator immediately notifies the Utilities Director when having to deviate from standard operating procedures. When an Operator discovers an equipment failure, a process unit upset, a change in the wastewater or sludge characteristics that presents a process change decision, the Utilities Director makes all of the decisions to resolve the issue. For example, The Utilities Director notifies PADEP when failed equipment is out of service for repairs, a process change, or an increase in flows due to heavy rain events. With these current practices and procedures, the Utilities Director is on call 24/7. During power outages, and with no backup generator, all available Operators and Mechanics report to the facility.

Response to emergency calls are more likely due to weather related events such as high flows during heavy rain events due to I/I issues. The staff routinely handles high flows Monday through Wednesday with no additional staffing. When high flows occur Thursday through Sunday, the Utilities Director calls in an additional Operator for each shift, resulting in overtime.

a) Heavy Rain Events

During high rain events, the Operators increase their rounds to once per hour to increase monitoring conditions while notifying the Utilities Director of various levels throughout the treatment process. The following is a list of activities performed at the wastewater treatment plant during high flow events:

- at 10 MGD
  - ✓ maintain all shifts with 2 Operators,
  - ✓ decrease flow from aeration tanks A and B to retain 30% of the biosolids,
  - ✓ turn off blowers for 4 hours, stop receiving septage from haulers,
  - ✓ reduce liquid waste sludge to one truck at a time,
  - ✓ notify PADEP of process changes,
  - ✓ maintain a 10 foot sludge blanket (or lower) in the clarifiers,
- at 25 MGD
  - ✓ when Lower Pottsgrove Township turns on high flow pumps at Porter Road pump station they notify the Borough's Operators,
  - ✓ Operators bolt a flood gate inside the Headworks to prevent overflow,
  - ✓ Operators manually rake rags off the bar screen bypass at the Headworks with additional flows from Porter Road pump station,

- ✓ switch the lead pump at lower Pump House from automatic to remote and the lag pump to off,
- ✓ perform a chlorine residual on the chlorine contact tank and the de-chlorination tank, and make adjustments to maintain a minimum chlorine residual of 0.5 m/l,

b) Overtime

90 percent or more of overtime at the plant relates to staff shortages that has occurred over the last four years. PBA has had to replace four operators, which takes a significant amount of time (placing the ad, interviews, etc.). New operators first need to be trained which takes additional time.

In terms of overtime due to injury, one staff member has been the source of all injury overtime over the last four years; however, the individual was able to work but had physical limitations in which he needed assistance from others to cover his specific responsibilities at the plant. As far as overtime due to sick leave, one staff member had a health issue that required him to be off for three months. In addition, when someone is on vacation, overtime occurs to fill the shift. During heavy rain events, there is overtime. Days lost to sickness have run between 499 and 633 hours for the past 3 years. A Workers compensation case in 2011 resulted in 90 days lost due to injury. Overtime is budgeted at 5.8% each year, close to the industry target of 5%, so this is a reasonable amount of overtime.

B. Wastewater Treatment Plant

The Pottstown Wastewater Treatment Plant treats domestic and industrial wastewater flows from the Borough of Pottstown and the adjacent communities of Lower Pottsgrove Township, Upper Pottsgrove Township and West Pottsgrove Township. Treated effluent is discharged into the Schuylkill River. Following a plant upgrade in 1991, the current rated design capacity of the treatment plant is 15.6 MGD. The existing facility is located in the southeast corner of the Borough along the Industrial Highway (Moser Road) near the intersection of Yost Road.

The JMT Team inspected and reviewed the efficiency and effectiveness of each unit process at the wastewater treatment plant (plant). The plant consists of a headworks facility utilizing mechanical bar screens and comminutors, followed by preaeration grit basins, aeration basins, final clarifiers and disinfection tanks utilizing gaseous chlorine. In terms of biosolids processing, waste activated sludge (WAS) is thickened, then stabilized by aerobic digestion before conveyance to centrifuges for dewatering purposes resulting in a Class B product. The plant has the option to generate Class A product by utilizing new indirect thermal drying technology. The plant treats an average of 6 MGD; however, flows can reach an excess of 50 MGD during a heavy rain event like what occurred in April 2014. This is an estimated flow only as currently flow in excess of 32 MGD cannot be metered since the existing flow meter flat lines at 32 MGD.

The JMT Team performed onsite inspection of each process unit (listed below) at the plant to evaluate their effectiveness, provide operational advice, and make recommendations to improve operations.

- Influent Pumping Station
- Mechanical Bar Screen
- Aerated Grit Chamber
- Aeration Tanks
- Final Clarifiers
- Chlorine Contact Tank
- Rotary Thickeners
- Aerobic Digesters
- Centrifuges
- Thermal Dryer

Refer to Appendix L for a catalog of the PBA wastewater treatment plant photographs. Refer to the Figure 2 graphic below illustrating each major unit process at the PBA plant, superimposed over an aerial photograph:

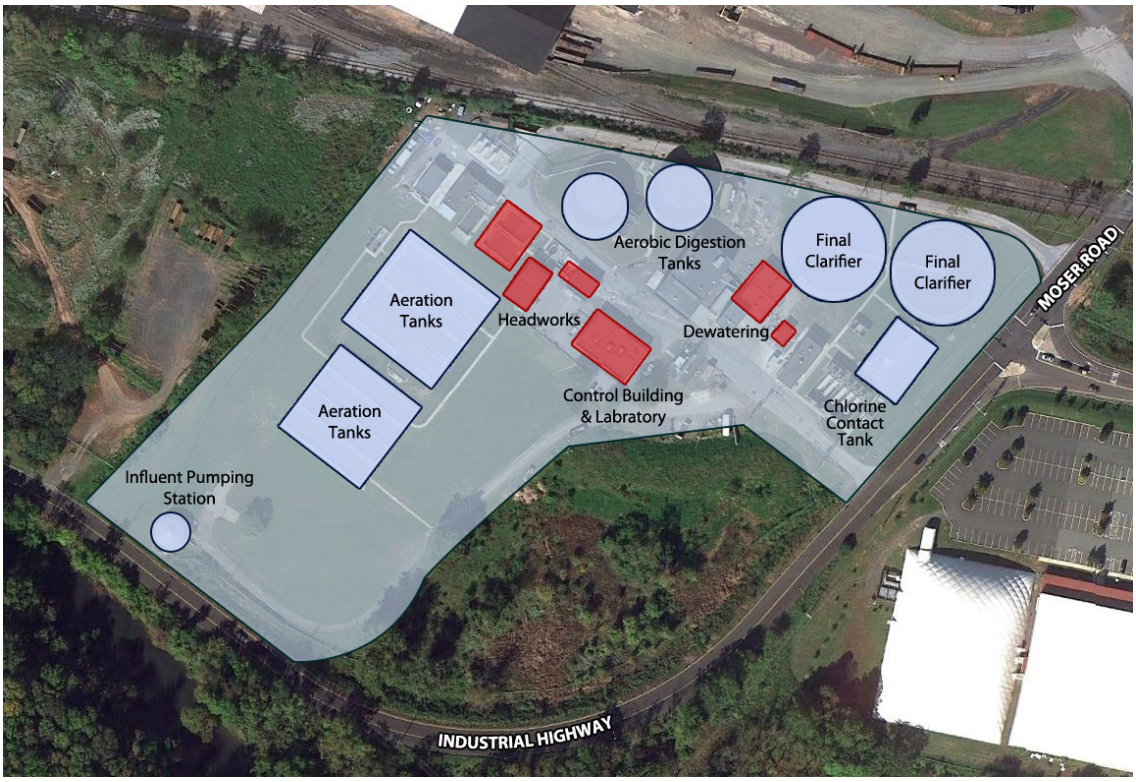


Figure 2 – Pottstown Borough Authority Plant Aerial Photograph

In addition, to visualize the hydraulic flow pattern as well as the plant's biosolids processing capabilities, please refer to the general plant Process Flow Diagram as Figure 3 below illustrating each major unit process. Appendix M presents a more detailed plant process flow diagram depicting additional unit processes.

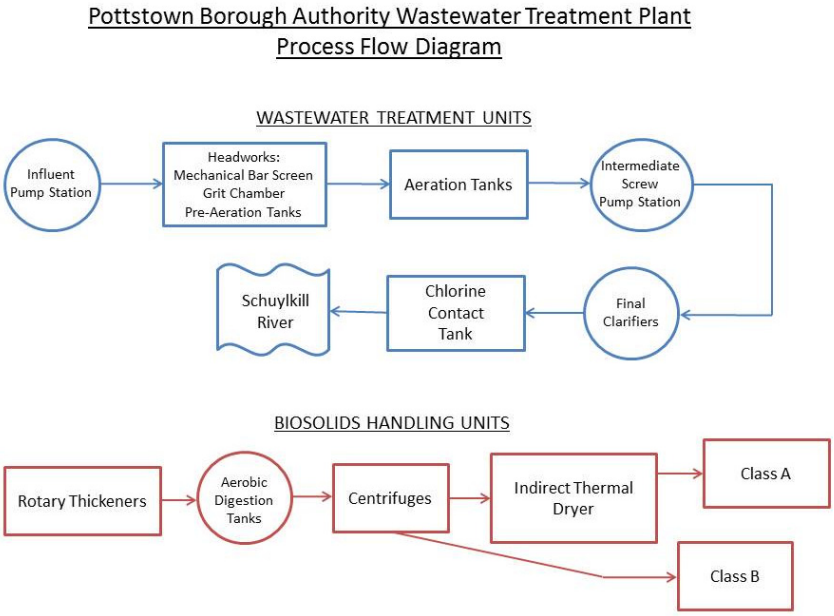


Figure 3
General Plant Process Flow Diagram

According to the 2011, 2012, and 2013 Chapter 94 reports, the average monthly flow at the plant has been less than the permitted capacity of 15.6 MGD, despite the high infiltration and inflow (I/I) and peak daily flows experienced at the plant. Please refer to Figure 4 below, presenting three years of hydraulic wastewater data (2011-2013) at the plant per the Chapter 94 reports charted against annual rainfall data:

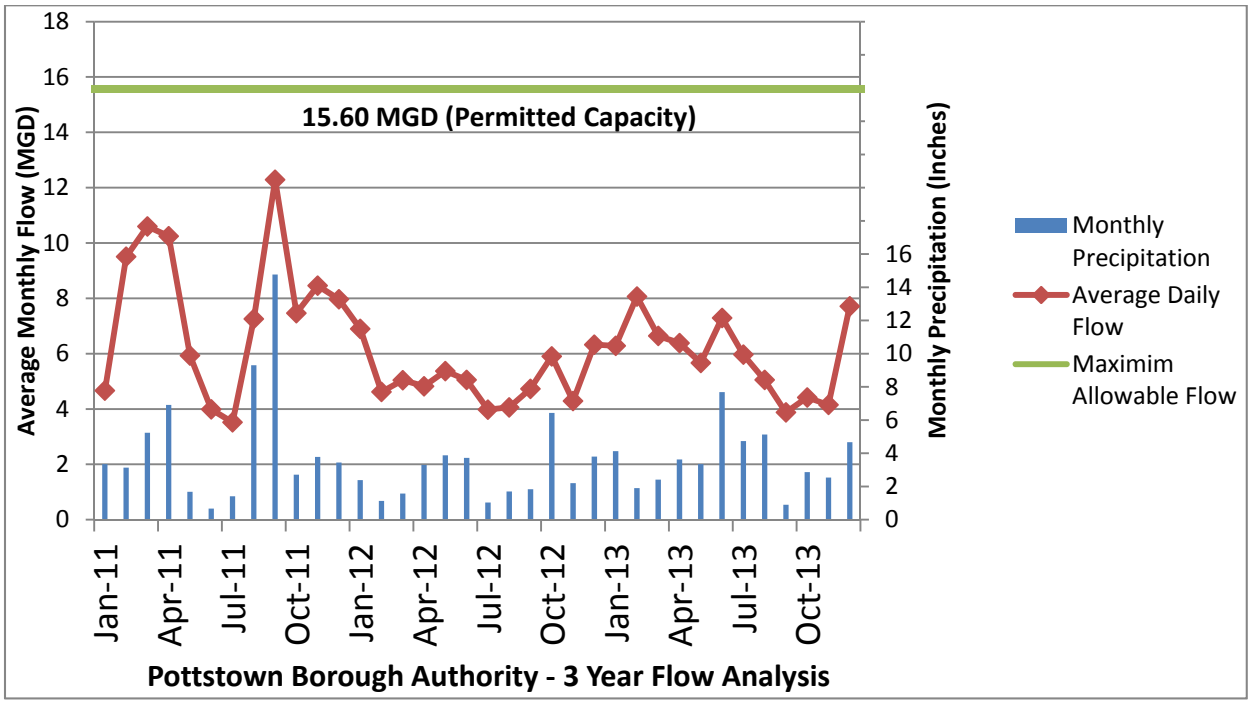


Figure 4

3 Year Hydraulic Flow Data

Not illustrated on the graph are peak daily flows, which can exceed 50 MGD as an estimated flow only. This "off the chart" flow due to heavy rain events causes operation problems at the plant. Once flow exceeds 25 MGD, operations turn down air at the aeration tanks, which compromises biological treatment capability.

The plant discharges treated effluent to the Schuylkill River. PADEP imposes typical secondary activated sludge treatment requirements at this facility. JMT contacted PADEP who indicated that the new permit contains a new total phosphorus and nitrogen monitor only requirement. Plus, PADEP stipulates, as negotiated by PBA, a new total dissolved solids (TDS) limit. The new permit effective February 1, 2014 will last less than one year. This is unusual as NPDES permits typically last 5 years before renewal is required but was done to monitor TDS levels. Please refer to Table 15 below, which presents the Authority's pertinent treatment parameters in accordance with its NPDES permit (#PA 0026786):

Table 15

PBA NPDES Permit Summary

	Maximum Load Allocation		Maximum Load Allocation	
Pollutant	**Monthly (lb/day)**	**Weekly (lb/day)**	**Monthly (mg/l)**	**Weekly (mg/l)**
CBOD				
(5/1 - 10/31)	2143	3215	20	30
(11/1 - 4/30)	2679	4287	25	40
Total Suspended Solids	3215	4823	30	45
Ammonia (As N)				
(5/1 - 10/31)	857	-	8	12
(11/1 - 4/30)	2143	-	16	30
Fecal Coliform (no. per 100 ml)			200	
Dissolved Oxygen	(Min. 5.0 mg/l at all times)			
Residual Chlorine	0.5 mg/l			
Total Phosphorus/Nitrogen	Monitor/Report			
Total Dissolved Solids *				3000

** Negotiated Limit that will be monitored for 1 year*

Appendix N includes the NPDES permit for the PBA plant. Per the scope of services in the RFP and Addendum #1, the JMT team reviewed and evaluated the Authority's wastewater treatment plant under each of the following categories:

- Plant Operations
- Plant Maintenance Programs
- Imported Sludge Program
- Imported Septage Program
- Class A versus Class B biosolids

1. Liquid Unit Processes

In terms of liquid process, the treatment plant consists of headworks with mechanical bar screens and comminutors, followed by modified pre-aeration/grit chambers, eight aeration tanks and at the end of the plant, two final clarifiers and last, chlorine and de-chlorination tanks, prior to stream discharge through a final effluent tank with a parshall flume to meter flow. After chlorination, the effluent is discharged through two 24-inch outfall pipes into the Schuylkill River. Documentation specific to the plant as provided by PBA is included in Appendix D.

The following is a description of each unit process followed by routine operations and preventive maintenance performed. At the end of each unit process, we provide efficiencies and/or inefficiencies discovered through JMT's plant inspection team along with recommendations for plant improvements or operational changes, if necessary. In addition, a rating of the unit process follows each process description from 1 (poor) to 5 (very good).

a) Influent Pump House

Description: The onsite pump station, Pump House, receives some of the raw wastewater from the sewers in the Borough that gravity flows into a deep wet well. The raw wastewater passes through a mechanical bar screen and pumped by one of the two 5,000 gpm alternating pumps to the headworks of Mechanical Bar Screen Building. The mechanical bar screen is on a timer that engages the rake to scrape the rags and other debris off the bar screen, lift them out of the wet well and into the wheelbarrow dumpster. Debris collected in the dumpster is hauled offsite to a landfill for disposal.

Plant Operations: During each round (4) of each shift (3), the Lead Operator physically inspects the influent pump station logging run hours, checking for leaks, overheating of motors and unusual noise. He or she ensures the mechanical bar screen is operating properly and replaces the full wheelbarrow with an empty wheelbarrow as needed.

Plant/Equipment Maintenance: The maintenance staff greases bearings and pumps quarterly, and inspects and replaces packing glands as needed. Outside contractors pull and service pumps every ten years replacing impellers and/or shafts as needed.

Inspection Comment/Recommendations: From visual observation, the pump station building and pumps are in very good condition; clean, painted and maintained. JMT recommends servicing pumps more frequently, than every 10 years utilizing an asset management plan. The mechanical bar screen has been in service over 20 years, though functioning, it should be replaced. Rating 4.

b) Mechanical Bar Screen Building (Headworks)

Description: The Mechanical Bar Screen Building receives all of the raw influent wastewater from the following sources:

- PBA's onsite influent pump station (Pump House),
- PBA's Memorial Park Pump Station (combined with wastewater from Grosstown Road and Circle Progress Pump Stations),
- Lower Pottsgrove Township's Porter Road Pump Station (combined with flows from Villa Drive and Sanatoga Lake Pump Stations), and
- four septage receiving stations at various locations throughout the wastewater treatment plant.

As the raw wastewater enters the headworks it splits between two FMC® mechanical bar screens that collects and prevents large inorganic objects (i.e., rocks, wood, rags, etc.) from entering the treatment process. Timers engage the mechanical bar screen rake to scrape off the collected debris on the bar screen and drops them into a wheelbarrow dumpster. Debris collected in the dumpster is hauled offsite to a landfill for disposal. The screened wastewater then passes through one of the two Dimminutors® (open channel comminutors) to break down the remaining debris into smaller pieces prior to entering the treatment process. Volume of screening removed will vary from 1.5 to 2.5 cu. yds. per day.

Plant Operations: During each shift (3), the Lead Operator inspects the mechanical bar screens 4 times per shift to ensure they are working properly and replaces the filled wheelbarrow with an empty one. During the third shift at 12 midnight, the Lead Operator collects the raw influent 24-hour composite sample (refrigerated), sets up the sampler for the next 24-hour sampling period, and takes the composite sample to the onsite PADEP certified laboratory and stores it in the refrigerator for analysis by the Borough's Laboratory Analyst.

During high flow events, Lower Pottsgrove Township's Operator redirects their raw wastewater from the Porter Road Pump Station to a separate bypass channel around the mechanical bar screens, through a fixed bar screen and recombined with wastewater as it enters the Pista Grit Removal tanks. An Operator manually rakes the rags off the bar screen through the high flow event, as needed. In anticipation of high flow events, the Operator bolts a high flow doorplate inside the doorway to the Mechanical Bar Screen

Building to prevent overflows. Level sensors in the headworks' influent channels override the mechanical bar screen timers to engage them more frequently during high flow events.

Plant/Equipment Maintenance: Within the past two years, the maintenance staff refurbished both mechanical bar screens and replaced the metal covers with stainless steel. The maintenance staff performs routine maintenance on equipment per manufacturer's recommendation or Best Management Practice.

Inspection Comment/Recommendations: Debris collected and removed from the mechanical bar screens also removes organics from the wastewater stream. Rags and other debris pass through the Dimminutors® during high flow events negatively affecting the treatment process downstream. Though JMT recommends making some improvement here to avoid rags from entering the treatment process that causes clogging of pumps, it may not be plausible unless the surge of high flows due to I/I issues throughout the municipalities' collection systems are addressed. In conclusion, this is a major hydraulic bottleneck of the treatment process during heavy rain events that could lead to raw wastewater overflows. Rating 2.

c) Pista Grit Removal

Description: The forward flow from the headworks passes through two Pista Grit® Removal tanks , currently off-line, that consist of 16-foot diameter tank (with a 2'-2"sidewall depth), a 5-foot diameter stilling well (6'-10") that holds a total volume of 4,265 gallons.

When the Pista Grit® system is online, grit removed from the treatment process is washed and dewatered within the grit building and deposited by use of a conveyor into a dumpster outside the building for temporary storage. The dumpster holds the grit temporarily until it can be removed for disposal. Overflow and backwash from this process flows by gravity to its outlet into the grit chambers' effluent trough. The Pista Grit® accumulates approximately 1 to 4.75 cubic yards of grit per day.

Plant Operations: The Pista Grit Removal system, though functional, is not in use because it is problematic to operate. The problem should be reviewed to determine a solution. Diffusers located at the bottom of the pre-aeration tank make it difficult to remove grit from the bottom of the tanks.

Plant/Equipment Maintenance: The Maintenance staff maintains the pumps, motors, piping and control panel either per manufacturer's recommendation or per Best Management Practices.

Inspection Comment/Recommendations: JMT recommends using the Pista Grit® that will adequately remove the grit. Rating 3.

d) Pre-Aeration Tanks (Grit Chambers)

Description: The split-flow from the Pista Grit® tanks hydraulically enters two parallel pre-aeration tanks (originally designed as clarifiers for grease removal) modified with an aeration system to reduce odors and to allow heavy debris (grit) to fall out of the wastewater stream and settle to the bottom of the tanks.

The pre-aeration tanks consist of two parallel rectangular tanks (37' X 30' with a 14' 3" sidewall depth) with a total volume of 118,315 gallons. Four alternating blowers provide oxygen and mixing. To mitigate odors, the staff replaced the course bubble diffusers with fine bubble diffusers in 2012. The pre-aerated wastewater gravity flows to the raw influent splitter box for biological treatment in the aeration tanks.

Plant Operations: The Operators visually inspect the pre-aerations tanks during their daily rounds and observe for failed diffusers and odors. During increased levels of odors, the Operators inject a low dose of chlorine into the raw influent to mitigate the odors.

Plant/Equipment Maintenance: Twice per year, the staff drains the pre-aeration tanks, manually clean out the grit with a vacuum truck, and haul it offsite to a landfill for disposal. While the tanks are empty, the maintenance staff inspects the diffusers and repairs and replace as needed.

Inspection Comment/Recommendations: Though the condition of the pre-aeration tanks is unappealing and considerably old, they effectively mitigate odors and collect settled debris. JMT Team recommends evaluating the unused Pista Grit system in combination with the pre-aeration tanks for a future upgrade to remove grit and grease and provide odor control. Rating 3.

e) Raw Influent Splitter Box

Description: The raw influent splitter box receives and mixes the raw influent with the return activated sludge (RAS) that is equally divided between four chambers marked AB, CD, EF and GH. Each chamber has manually operated sluice gates to direct the flow to eight activated sludge extended aeration tanks marked A, B, C, D, E, F, G and H.

Plant Operations: During each round (4) of each shift (3), the Lead Operator inspects the splitter box to ensure it is operating properly and distributing flow equally to each aeration tank.

Plant Maintenance: The maintenance staff greases the gate valves, as needed.

Inspection Comment/Recommendations: From a visual observation, the raw influent splitter box appears to be in good operating condition. Rating 4.

f) Aeration Tanks

Description: The combined raw wastewater and Return Activated Sludge (RAS) flows by gravity from the Raw Influent Splitter Box to the front of each aeration tank that operate individually in parallel trains. The mixed liquor hydraulically travels through eight aeration tanks with an average retention time of 24 hours. Though six aeration tanks could handle the average daily flows, all eight aeration tanks are in service. Each extended aeration treatment processes consists of fine bubble diffusers arranged in a grid pattern with three zones for step aeration. Each aeration tank has a total volume of 422,352 gallons.

Four centrifugal blowers (alternate between two on and two in standby) provide oxygen and mixing though fine bubble diffusers (discs) on the bottom of each aeration tank. The activated sludge (mixed liquor) gravity flows to the screw pumps' holding tank.

1. Number of units	Four (4), one is standby
2. Type of blowers	Centrifugal
3. Capacity	Two at 4343 scfm, Two at 4115 scfm
4. Activated sludge reactors	11,982 scfm
5. Pre-aeration tanks	370 scfm
6. Waste sludge holding tank	216 scfm

Plant Operations: Twice during each shift, the Lead Operator inspects each of the eight aeration tanks to observe foaming and color of the mixed liquor; sample, analyze and record DO and pH for each train, and inspect the four alternating blowers. Once per week, a Lab Analyst collects a grab sample from each aeration tank and analyzes it for total suspended solids.

Plant/Equipment Maintenance: The maintenance staff cleans the tanks and flexes diffusers as needed.

Inspection Comment/Recommendations: From a visual observation, all of the aeration tanks and equipment appear to be in good operating condition. With adjustments to the aeration tanks, the activated sludge process could potentially provide biological nutrient removal of phosphorus and ammonia, if required. However, if PADEP imposes a phosphorus limit, then chemical addition, using ferric chloride or ALUM, at a minimum, would be most likely required. Rating 4.

Given the lack of tankage at the head of the plant, one new technology application that is available is called the CoMag® or the BioMag® process.

The BioMag® process operates using ballasted flocculation, with magnetite as the ballast. Aluminum sulfate (alum, 48.5% solution) and an anionic polymer are used in the coagulation process along with the magnetite, to create a very dense floc which settles rapidly as a result of the high specific gravity of the magnetite (SG ≈5.2, approximately twice that of sand) inside the aeration basin. Due to the inherent properties of the magnetite, the ballast is easily recovered using a magnetic drum to which the substance adheres once sheared from the tertiary sludge. The magnetite is then recycled for repeated use, and phosphorus, which is bound in the precipitate, leaves the treatment stream in the tertiary sludge.

The clarifier effluent passes through a final polishing filtration magnet to remove any carry-over of magnetite and to achieve even lower solids levels. Since the filter is electromagnetic, backwashing to remove particles from the filter is performed by simply turning off the power to the magnet and sending a slug of water for approximately ten seconds, once every five hours. Figure 5 illustrates the steps of the BioMag process, and Table 16 outlines typical full scale treatment results. CoMag® is an additional step in this process, where further magnetite is added to the flocculation in the secondary clarifier to allow for an additional polishing step to remove additional particulate phosphorus.

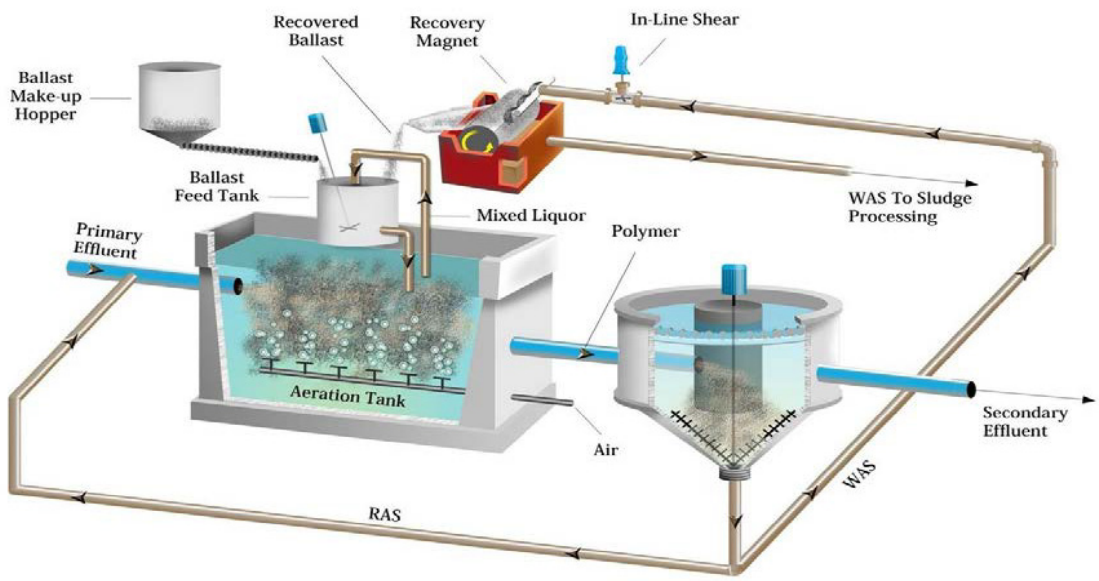


Figure 5 – BioMag® Process Schematic

(courtesy of Siemens Water Technology)

Table 16 - BioMag® Process; Typical Effluent Criteria

MLSS	10,000 mg/L
Clarifier Solids Loading	80 – 100 lbs/day-ft^2
SVI	40 – 50 mL/g
BOD5	2 mg/L
NH3-N	ND
Total Nitrogen	< 10 mg/L
Total Phosphorus	< 0.2 mg/L Ortho
Phosphate	< 0.05 mg/L
Turbidity	< 0.5 NTU

The use of the BioMag has been preliminarily reviewed in 2013 discussions related to high flow events and it turned out to be costly. The very preliminary order of magnitude estimate is around $6,000,000. The capture rate of BioMag is 95%. PBA has had no assurances that the BioMag remaining in the sludge would not be an issue for land disposal and would not be an issue for the dryer process. To fully evaluate this process, a more detailed study is needed to develop a cost/benefit analysis vs. other solutions to I/I within the plant. The other concern with adding a process to the plant is where to locate it. Any recommendations must take into consideration the lack of available space above the 100-year flood plain, or the cost for the recommendation would have to include the permitting and construction within the 100-year flood plain. In addition, there are contaminated soils on site which would have to be legally disposed of to an approved landfill/

g) Screw Pumps

Description: A holding tank at the bottom of the screw pumps receives the gravity fed mixed liquor from the aeration tanks where five screw pumps lift the mixed liquor to the mixed liquor splitter box prior to returning to the clarifiers.

1. Number of units	Five (5) (1 screw pump is standby)
2. Size	72-inch diameter
3. Capacity	10,000 gpm each

Plant Operations: During each round (4) of each shift (3), the Lead Operator inspects the oil level at the sight glass and fills it with oil as needed. Once during each shift, with average daily flows, the Lead Operator manually alternates the screw pumps by:

- turning on the oiler switch for the pumps in standby,
- visually seeing oil running down the screw pump shaft,
- turning off the oiler switch,
- turning on the standby pumps, and
- turning off the on pumps.

During extremely cold winter days, the Lead Operators will alternate the screw pumps hourly. During high flow events, the Lead Operator will place four screw pumps in service to keep up with the increased flows.

Plant/Equipment Maintenance: As preventive maintenance, the Maintenance Staff filters the oil in the gearbox twice per year, grease rings and rollers quarterly, and adjust belts as needed. They also maintain the oiler system checking levels, repairing and/or replacing check valves as needed. Appendix O includes a field service report pertaining to the screw pumps.

Inspection Comment/Recommendations: From a visual observation, all of the screw pumps and equipment appear to be in average operating condition. With the long delivery time to replace a failed screw pump, in addition to the history of broken shafts and bearing failures, the JMT Team recommends an emergency backup plan. Secondly, some utilities have changed out screw pumps with centrifugal submersible pumps because they are such a high maintenance item. "Shearing of the floc" may also be an issue so single, double vane or recessed impellers would have to be evaluated along with operation at slower speeds if submersible pumps are installed. We recommend replacing the screw pumps, one at a time as they fail, with a submersible pump system. Implementing an Asset Management plan for at least the larger pieces of equipment would provide for significant improvement in predicting maintenance requirements. In the last 15 years of operation, the previous budgets has allocated monies for each screw pump to be fully inspected and the bearing replaced, plus other identified long term maintenance issues addressed. To replace the screw pumps with a new submersible pump stations, capable of pumping a rate of over 60 MGD, may require a new pump station. The new pump station would be constructed while the existing facilities remains in operation. Rating 2.

h) Mixed Liquor Splitter Box

Description: The mixed liquor splitter box has two manually operated dual shaft sluice gates that divide the mixed liquor equally between two clarifiers. Slow rotating skimmers push floatable debris (plastics, greases, etc.) on the surface of the clarifiers that leads up to a scum pit in the splitter box.

Plant Operations: The Lead Operator inspects the mixed liquor splitter box daily to ensure it is operating properly. The Operators collect a grab sample and take it to PBA's laboratory for total suspended solids analysis and 30-minute settle ability for process control adjustments. When the scum pit is full, the Operators empty the scum pit with a vacuum truck and dispose of it into the hauler receiving station for treatment in the aerobic digesters.

Plant Maintenance: The Maintenance Staff maintains the splitter box using Best Management Practices.

Inspection Comment/Recommendations: From a visual observation, the mixed liquor splitter box appears to be in good operating condition. Rating 4.

i) Final Clarifiers

Description: Two circular clarifiers operate individually in parallel trains each equipped with a skimmer on top of the surface to remove floatable debris and a scrapper on the bottom of the clarifier to collect return activated sludge into a pit that gravity flows to the RAS wet well. Each clarifiers consists of 117-foot diameter tank with a 14-foot sidewall depth, a surface area of 10,751 square feet, and a weir length of 672 feet with a volume of 1,125,878 gal/tank

Plant Operations: During each round (4) of each shift (3), the Lead Operator inspects each clarifier, observes the skimmer is moving, the beach and weirs are free of debris, and measures the sludge blanket depth. Using a sludge judge, the Operator measures and records the sludge blanket at various places (depending on flows) inside the clarifier. The Operators maintain a foot (or less) blanket.

Plant/Equipment Maintenance: The Maintenance Staff performs preventive maintenance per Best Management Practices.

Inspection Comment/Recommendations: From a visual observation, both clarifiers appear to be in good working condition. To provide flexibility in the treatment process, especially if the I/I is not significantly reduced, JMT Team recommends decreasing the hydraulic loading rate to the existing clarifiers by adding a third clarifier or by alternate means.. Rating 4.

j) Chlorine Contact Tank

Description: Two rectangular chlorine contact tanks provide the necessary detention time to disinfect the treated effluent. A chemical feed pump injects sodium bisulfite into the end of the second chlorine contact tank for de-chlorination. The chlorine contact tanks consist of two serpentine channels, each 76 feet long and 27 feet wide with a sidewall depth of 11 feet and hold a volume of 168,838 gallons.

The chlorine building contains a chlorination system capable of supplying chlorine at a rate of up to 2,400 pounds per day for forward flow disinfection, and up to 1,950 pounds per day for RAS treatment. Average chlorine consumption is 1,170 pounds per day for effluent disinfection at a flow rate of 15.6 MGD. Purchasing Chlorine gas is economical at $3.75/ton.

Plant Operations: During each round (4) of each shift (3), the Lead Operator inspects the chlorine contact tanks, collects grab samples from the chlorine contact and the de-chlorination tanks, analyzes them for chlorine residuals, and logs results. Based upon the chlorine residuals and current flows, the Lead Operator adjusts the gas chlorine and the sodium bisulfate feed rates per the posted standard operating procedures.

Once per week, the Operators drain both chlorine contact tanks separately and, using a fire hose with utility water, washes out the settled debris and it is returned to the headworks. The Lead Operator also washes off the debris collected on a metal screen that prevents debris from entering the utility water and final effluent.

Plant/Equipment Maintenance: The Maintenance Staff maintains the chlorine contact tank including the valve actuators using Best Management Practices.

Inspection Comment/Recommendations: From a visual observation, both chorine contact tanks appear to be in good working condition. Noticeable floatable solids, scum, and grease were evident in the tanks. Recommend the addition of a scum trough to capture floatable solids as a prevention from disposal to the stream. Rating 3.

k) Utility Water Supply

Description: The wastewater treatment plant uses utility water generated from the treated effluent pumped out of the chlorine contact tank and filtered with fine screen filters prior to use in the treatment facility. The utility water system (upgraded in 2011) consists of three vertical turbine (constant pressure) pumps with variable speed to produce up to 450 gallons per minute. The system is equipped with a strainer to manual cleaning as needed.

Plant Operations: During each shift, the Lead Operator inspects the utility water pump house to ensure it is working properly.

Plant/Equipment Maintenance: The Maintenance Staff rebuilt the fine screen filters and installed new pumps in 2011. The Maintenance Staff annually pulls and cleans the fine screen filters.

Inspection Comment/Recommendations: From a visual observation, the utility water appears to be in very good working condition. Rating 5.

l) Final Effluent Flow Meters

Description: A Final Effluent Tank (that follows the chlorine disinfection and de-chlorination tanks) is equipped with a parshall flume and an ultrasonic flow meter that measures the final effluent prior to stream discharge. In addition, a Sigma® flow meter, also inside the Final Effluent Tank captures higher flows during high rain events.

Plant Operations: During the third shift at 12 midnight, the Lead Operator records the final effluent flow, collects the flow paced 24-hour composite sample (refrigerated), sets up the sampler for the next 24-hour sampling period, takes the composite sample to the onsite PADEP accredited laboratory, and stores it in a refrigerator for analysis by the Laboratory Analyst.

Plant/Equipment Maintenance: The Maintenance Staff maintains the Final Effluent Tank using Best Management Practices. An outside contractor calibrates the flow meters annually.

Inspection Comment/Recommendations: From a visual observation, the Final Effluent Meter appears to be in average working condition and operates properly during normal flows. However, during high rain

events, the water turbulence produces false effluent readings above 32 MGD. This meter is planned to be replaced in 2014 under contracts 148 and 149 to add a parallel flume to allow the plant to accurately record the peak flows up to 64 MGD. Rating 1.

m) RAS Wet Well Tank

Description: Pumps lift the Return Activated Sludge (RAS) settled in the clarifiers to the RAS Wet Well Tank, where it combines with filtrate from the rotary drums and is returned by gravity to the aeration tanks through the raw influent splitter box. The RAS Wet Well Tank is equipped with two submerged turbine mixers to keep the RAS thoroughly mixed, two sludge pumps that waste sludge out of the RAS Wet Well Tank to two rotary drum thickeners. The tank is also equipped with a sludge pump to lift the RAS to the aerobic digesters for thinning digested sludge to maintain the percent solids prior to dewatering through the centrifuge. The tank has a retention time or approximately one minute.

Plant Operations: During each round (4) of each shift (3), the Lead Operator inspects the RAS Wet Well Tank. The first shift Lead Operator daily takes a grab mixed liquor suspended solids (MLSS) sample to the laboratory for total suspended solids analysis. The Operators inject a low dose of chlorine into the RAS Wet Well Tank to reduce filamentous growth that could prevent good settle-ability in the aeration tanks.

Plant/Equipment Maintenance: The Maintenance Staff annually service the sludge pump and mixers per Best Management Practices.

Inspection Comment/Recommendations: From a visual observation, the RAS Wet Well Tank appears to be in good working condition. Rating 4.

n) Alternate Forms of Disinfection

Chlorine gas has traditionally been used for wastewater disinfection since the 1930's, as an inexpensive and effective means of disinfection, but comes at the cost of extensive risk management and supervision. Disinfection by-products and residual chlorine can be a concern based on dosage rate and receiving water bodies with chlorine application. Sodium hypochlorite (liquid bleach) is an alternative to chlorine gas; however, it is more costly and has similar environmental concerns but with a greater degree less of risk management should a spill or tank leak or failure occur.

The increasing concerns about the hazards of chlorine disinfection to the public, the operators and the environment have increased the overall cost of chlorination and dechlorination chemicals along with the administrative efforts required to meet safety regulations. As a result, UV disinfection has increasingly become the method of choice for wastewater disinfection due to some significant advantages over chlorine-based disinfection. Specifically, UV has been proven effective in various types of effluent, requires less maintenance, and is cost-effective and can be retrofitted in many applications to existing chlorine contact tanks and has significant benefits compared to chlorine disinfection.

Advancements in UV technology over the years have significantly reduced the amount of maintenance required by operations staff. Advances such as the automatic chemical/mechanical cleaning systems, has reduced the need to manually clean lamp quartz sleeves. The development of more efficient, longer-life and high-output lamps results in fewer lamps to service and maintain as well as reduces the required footprint.

UV disinfection also has the added benefits of not being affected by temperature or pH of the effluent. UV does not create any disinfection byproducts and can disinfect chlorine-resistant microorganisms like *Cryptosporidium* and *Giardia*. Retrofitting the gaseous chlorine to UV should be considered.

o) Flood Protection

The 100-year flood elevation of the Schuylkill River across the Pottstown Wastewater Treatment Plant has been delineated by a F.E.M.A. flood insurance study as elevation 140 feet-2 inches. The floodplain encroaches on approximately 60 percent of the wastewater treatment plant property.

The existing aeration tanks are presently located within the 100-year floodplain. The old tanks have a top wall elevation of 137 feet 6 inches (137' 6"). To protect these tanks from the 100-year flood, an earthen berm was built surrounding the tanks with a top berm elevation of 141 feet 8 inches. A 48-inch outfall sewer was constructed in the 100-year floodplain. The top of the manhole is at elevation 127' so a watertight manhole cover is provided.

No other structures remain within the 100-year floodplain. The plant is designed to function hydraulically during a 100-year flood, and since access to the plant lies outside the 100-year floodplain, all units and buildings should be accessible during a flood. This limits any new tankage or technology to be placed in the open space near the aeration tanks.

p) Emergency Power

Presently, dual power feeds provide primary and secondary power to the plant as supplied by PECO. While this appears to provide reliable power supply, recently, the plant experienced a power outage in April 2014. A meeting with PECO should determine "root cause" of the problem as to why it occurred.

Most of the peer group utilities have onsite emergency generators that provide auxiliary power in the event of an outage. Providing full emergency backup would require two generators (750 KVA or 1000 KVA) at an estimated cost of between $1.2m to $1.5m. Location of the proposed generators and soil conditions would also have to be evaluated.

q) Safety Considerations

The Pottstown Wastewater Treatment Plant 1989 upgrade was designed following applicable OSHA and PADEP requirements. Safety features included the following:

1. Fence around site – except no gate or card reader
2. Shaft guards on motor drives and couplings
3. Hand railing around tanks
4. Alarms and emergency showers at the chlorine building and laboratory
5. Eye wash stations at polymer systems and laboratory
6. Provision of first-aid kit in the control building
7. Posting of "Non-Potable Water" signs at yard hydrants
8. Containment dikes around polymer tanks

Pertinent flow data as well as influent flow distribution as taken from the 1990 design engineers report during the last upgrade is presented in Table 17 below:

Table 17

PBA Plant; Flow and Distribution	
Influent Flow Rates Description	Plant Total
Average Daily Flow, mgd:	12.85
Max. Monthly Flow, mgd:	15.60
Peak Storm Day Flow, mgd:	27.03
Peak Hourly Flow Rate, mgd:	30.00
Peak Instantaneous Flow Rate, mgd:	32.00
Influent Flow Distribution Source	Max. Monthly Flow MGD
Lower Pottsgrove Force Main	3.747
Hillside Gravity Interceptor	0.725
Bailey Gravity Interceptor	2.661
Existing WWTP Pump Station	6.045
Manatawny Creek Pump Station	2.442
Totals	15.620

2. Biosolids Unit Processes

Treatment of the bio-solids generated at the treatment plant consists of two rotary thickeners, two aerobic digesters, two centrifuges and a thermal dryer to produce Class A and/or Class B sludge for land application. Appendix P provides documentation specific to the biosolids program as provided by PBA staff.

The treatment plant also receives and treats residential septage from outside septic haulers as well as liquid waste fed directly to the digesters from preapproved municipalities and industries including leachate.

Waste activated sludge is mechanically thickened, aerobically digested, and dewatered by centrifuges prior to discharge into a sludge bulking system. The sludge bulking system was designed to blend sand with the processed sludge in order to increase the solids content. The sludge will then meet the required 20 percent minimum solids content required for landfill disposal. A 16 cu. yd. dumpster stores the sludge temporarily, prior to disposal. The dumpster is covered by a canopy. Filtrate removed during the sludge dewatering process is sent by force main to the pre-aeration tank influent box. Anticipated sludge accumulation (prior to blending) is 38 to 93 cu. yds. per day.

The Pottstown Landfill operated by Waste Management of PA, located on Sells Road, Pottstown, was closed in the 1990s. This precipitated the need to look at alternate methods of disposal.

a) Rotary Drum Thickeners

Description: Sludge pumps waste sludge out of the RAS Wet Well Tank and two rotary drums thicken the sludge at up to 300 GPM. A chemical feed pump adds liquid polymer to the liquid sludge prior to entering the rotary drums to start the thickening process. Inside the rotary drums, an auger mixes and moves the sludge through the drum and a rotating fine screen allows the liquid to fall out to produce sludge at about 2 to 3 percent solids. The thickened sludge gravity flows to the Sludge Thickener Tank.

- Equipment

1. Number of thickeners	Two (2)
2. Type	Mechanical rotary thickeners
3. Discharge provisions	Screw conveyor with discharge to thickened sludge holding tank

- Process Information

1. Sludge Load:	Minimum	Maximum
GPD	215,600	437,770
% solids	0.62	0.62
lbs DS/day	11,211	22,620
2. Thickeners:		
Operating	2	2
Days/week	7	7
Hours/day, max.	15	15
Average GPM/unit	120	243
Average lbs DS/hr/unit	347	754
3.Thickened Sludge:		
GPD	27,480	55,450
lbs DS/day	10,314	20,811

The old dissolved air flotation tank was retrofitted and divided into two zones. First zone is for receiving WAS prior to sludge thickening and the second zone is dedicated to holding thickened sludge for transfer to the aerobic digesters.

Plant Operations: During each round (4) of each shift (3), the Lead Operator inspects the rotary drums, washes down the debris collected on the screen and ensures they are working properly.

Plant/Equipment Maintenance: The Maintenance Staff performs preventive maintenance (oil, grease, etc.) using Best Management Practices. In 2013, the Maintenance Staff refurbished one of the rotary drums and is refurbishing the other drum during our review.

Inspection Comment/Recommendations: From a visual observation, the rotary drums appear to be in good working condition. Rating 4.

b) Sludge Thickener Tank

Description: The Sludge Thickener Tank is equipped with a mixer and sludge pumps to lift the thickened sludge to the aerobic digesters for further treatment.

Plant Operations: During each round (4) of each shift (3), the Lead Operator inspects the Sludge Thickener Tank and adjusts the mixer, on or off, to keep the sludge mixed to maintain 2 to 3 percent solids. The first shift Lead Operator collects a grab sample of the thickened sludge daily and takes them to the Borough's laboratory for total solids and analysis.

Plant/Equipment Maintenance: The Maintenance Staff annually removes and inspects the mixer to perform recommended maintenance per the manufacturer or by Best Management Practices.

Inspection Comment/Recommendations: From a visual observation, the Sludge Thickener Tank appears to be in good working condition. Rating 4.

c) Aerobic Digesters

Description: Digester T5 typically receives WAS from the Sludge Thickener Tank, hauled in liquid waste from outside sludge haulers, and transferred to aerobic digester E-T5. The aerobic digesters are aerated and mixed with forced air from three alternating blowers with two on and one in standby.

1. Number of tanks	Two (2)
2. Dimensions	
a. ET-5A (primary)	75 ft diameter x 24' - 11 I s.w .d.
b. T-5 (standby)	78 ft diameter x 23' - 0" s.w.d.
3. Volume	
a. ET-5A	823,497 gallons
b. T-5	822,069 gallons
4. Aeration Blowers	
• Number of units	Four (4), (one is standby)
• Type of blowers	Positive displacement with VFD
• Capacity	2800 scfm
• Aerobic digester, primary	4050 scfm
• Aerobic digester, standby	4000 scfm

Thickened sludge is aerobically digested in digester ET-5A. T-5 was intended as a stand-by digestion tank and as an equalization tank for trucked-in wastewaters.

Plant Operations: The Lead Operator manually adds water to the digester for odor control and thinning of the sludge to meet optimum conditions for the dewatering process, if the percent solids increase. Depending on the volume or the biology of the sludge in digester E-T5, the Operators can bypass digester E-T5 and feed the sludge directly to digester T5. The Lead Operator collects a sludge sample from each digester daily and takes it to the Borough's laboratory for total solids analysis and once per week for volatile solids analysis.

Plant/Equipment Maintenance: The Maintenance Staff performs preventive maintenance per Best Management Practices. The staff annually empties the digesters to remove any buildup of grit and repair/replace diffusers.

Inspection Comment/Recommendations: From a visual observation, both aerobic digesters appear to be in good working condition. Rating 4.

d) Centrifuges

Description: Two 120 GPM centrifuges dewater the sludge between 18 to 20 percent solids and are either pumped to the thermal dryer for Class A sludge disposal or dropped directly onto a conveyer belt and into a dumpster for Class B sludge disposal. Centrifuges replaced the old belt filter presses in 2005.

Plant Operations: During each round (4) of each shift (3), the Lead Operator inspects the centrifuges and adjusts the intake feed rate and/or the polymer feed rate to achieve optimum dewatering of the sludge. The Lead Operator collects a centrifuge centrate sample daily for total suspended solids analysis and a centrifuge cake sample for a total solids analysis performed by the Borough's laboratory. Once per week, the Lead Operator collects a centrifuge cake sample and takes it to the laboratory for volatile solids analysis.

Plant/Equipment Maintenance: The Maintenance Staff grease the centrifuges using Best Management Practices, which they discovered on their own from experiences. The manufacturer services both centrifuges annually.

Inspection Comment/Recommendations: From a visual observation, both centrifuges appear to be in good working condition. JMT Recommends maintaining spare parts (bowl with barring blocks) and perform onsite servicing per manufacturers recommendation rather than annually sending each centrifuge out for service, which seems excessive. Rating 3.

e) Thermal Dryer

Description: A sludge-holding tank inside the thermal dryer receives the dewatered sludge and pumps lift the sludge to a thermal dryer for Class A biosolids disposal. Biosolids pass through the thermal dryer in about eight hours at temperatures of up to 300º F. A boiler provides the heat exchange to achieve the required temperatures for Class A biosolids disposal.

Plant Operations: During each round (4) of each shift (3), the Lead Operator inspects the thermal sludge dryer and adjusts the intake feed rate, as needed.

Plant/Equipment Maintenance: The Maintenance Staff performs preventive maintenance using Best Management Practices. The manufacturer annually services the dryer and/or makes repairs when needed. An outside contractor annually services the boiler. To mitigate the extensive odors generated from the dried sludge, the Maintenance Staff built, installed and operate a volatile spray system over and inside the thermal dryer building.

Inspection Comment/Recommendations: From a visual observation, the thermal dryer is relatively new and appears to be in good working condition; however has gone down for service in May 2014. Further, no operations staff are boiler certified or licensed at the present time. Rating 3.

3. Bulk Program

The WWTP receives septage from local residential septic tanks and liquid waste (treated biosolids) from municipalities at its facility including leachate from a compost facility. Septage and liquid waste haulers have access to the Borough's WWTP 24 hours a day, 7 days per week. The Borough's facility has four designated septage receiving stations for septage waste haulers that discharge directly to the headworks for additional treatment through the activated sludge process.

In addition, the Borough has two liquid waste receiving stations that pumps hauled in liquid waste from outside biosolids haulers directly to digester T-5 for additional treatment.

The laboratory preapproves septage and liquid waste haulers and provides them with a password and user name for access to an onsite computerized login station. As the hauler brings in a load, the truck driver logs in, provides the generator's name, location, type of waste, and drops off a sample. The computer generates a manifest receipt for each driver for his or her records. The Borough's laboratory performs percent solids on municipal waste and randomly tests pH. The computerized system also creates a fee for each load based upon percent solids.

a) Imported Biosolids Program

The Authority receives a significant amount of outside solids from various sources, so it is incumbent upon the Authority to have an effective quality control system in place. Operations should institute high quality control with respect to its imported solids program due to high metals from its industrial customers. Our Team reviewed the procedures for receiving and managing municipal and industrial

sludge at the plant to determine the feasibility of the program versus costs. This appears to be reasonable protocol for tracking and taking in wastes.

We reviewed the impact of receiving municipal and industrial sludge on the dewatering equipment and the bio-solids handling and disposal. Given the twelve significant industrial users (SIUs), which are predominately metal finishing companies, it behooves operations to maintain a strong database of outside haulers to assure there is an effective control system in place to properly manage this program.

We reviewed the current monitoring procedures for quality and quantity control of municipal and industrial sludge received at the plant each day. Haulers should be certified. Furthermore, a sample should be taken before the solids are processed at the plant and verified. Safeguards should be in place to prevent a "hot" load discharge causing a system upset or a non-compliance event. Rates charged to customers are based upon strength of waste and percentage of solids and appear low to average compared to other utilities.

b) Imported Septage Receiving Program

Our Team reviewed the procedures for receiving residential septage at the plant to determine the feasibility of the program versus costs. We reviewed the impact of receiving residential septage disposed directly into the headworks of treatment plant, as well as the impact it has on dewatering equipment and the bio-solids handling and disposal facilities. Included with our staffing plan review, we identified the appropriate staffing levels necessary for this program. Our study included the current monitoring procedures for quality and quantity control of residential septage received at the plant each day. Similar to imported biosolids, the septage rate charged by the Authority is less than the industrial average.

Under this task, the JMT Team:

- Identified rates charged and compared to NACWA financial survey. Based upon preliminary review, it appears that the Authority is charging less than the industrial average for importing Septage and outside biosolids.
- Reviewed rate setting to determine accuracy of rates
- Reviewed staffing and control mechanisms

4. Biosolids Disposal Options

In 2013, 2,300 dry tons of Class A material were generated by the dryer while 18,000 wet tons of Class B material were produced by the centrifuges. Evaluating Class A versus Class B is the classic cost-benefit analysis. Does the extra cost to produce Class A solids provide such a benefit to the Authority that it not only offsets the operational cost to run the dryers (which are driven by natural gas) but also offers the flexibility of variable disposal options? Options include disposal by landfill or land application (current practice) and ideally, an additional revenue stream by marketing and selling the product to the community. The Authority budgets $400,000/year in natural gas. These and other costs (electricity, labor, etc.) were evaluated to justify the reduction of solids to 70% to 90% by volume. As the Authority recently received bids for Class A and Class B solids, landfill disposal costs were evaluated. The JMT Team presented the quantitative and qualitative advantages and disadvantages of producing Class A solids versus Class B. Some local utilities like Derry Township sell their Class A product to farmers and landscapers. In addition, private companies like Synagro, USfilter and Ameresco market and sell their Class A biosolids.

Under this task, the JMT Team:

- Reviewed the Borough's procedures for biosolids handling and disposal to determine the feasibility of the current program and compared expenses versus costs for both Class A and Class B solids

- Reviewed the current procedures for drying the sludge to produce Class A sludge including costs for labor, chemicals, disposal and utilities. We compared the costs with the costs to produce Class B sludge and noted the differences
- Reviewed the current procedures to optimize dewatering systems including the thickeners and centrifuges for labor, chemical, disposal and utility costs
- Based upon our research, we include a recommendation as to which disposal method makes the most sense economically for the Authority moving forward

Description: Class B biosolids generated from the centrifuge are land applied to farmlands at a significantly lower cost than disposal at a landfill. The opportunity for land applying Class B biosolids is short as farmers typically employ the solids prior to seeding. Regulatory requirements for storing these solids include a liner underneath and a covering over top with no runoff from rain.

Class A biosolids generated from the thermal dryer are land applied to farmlands at a significantly lower cost than Class B biosolids in terms of disposal costs. There are no regulatory requirements to store these solids.

Plant Operations: During each round (4) of each shift (3), the Lead Operator coordinates the removal of filled roll off dumpsters from the centrifuges and trailers from the thermal dryer.

Plant/Equipment Maintenance: The Maintenance Staff performs preventive maintenance using Best Management Practices to maintain the conveyor systems.

Inspection Comment/Recommendations: From a visual observation, the biosolids handling and disposal appear to be in good working condition.

JMT performed an analysis of Class A and B biosolids taking into account production and annual operating costs. Figure 6 illustrates the biosolids flow diagram with typical biosolids production based upon 2013 data.

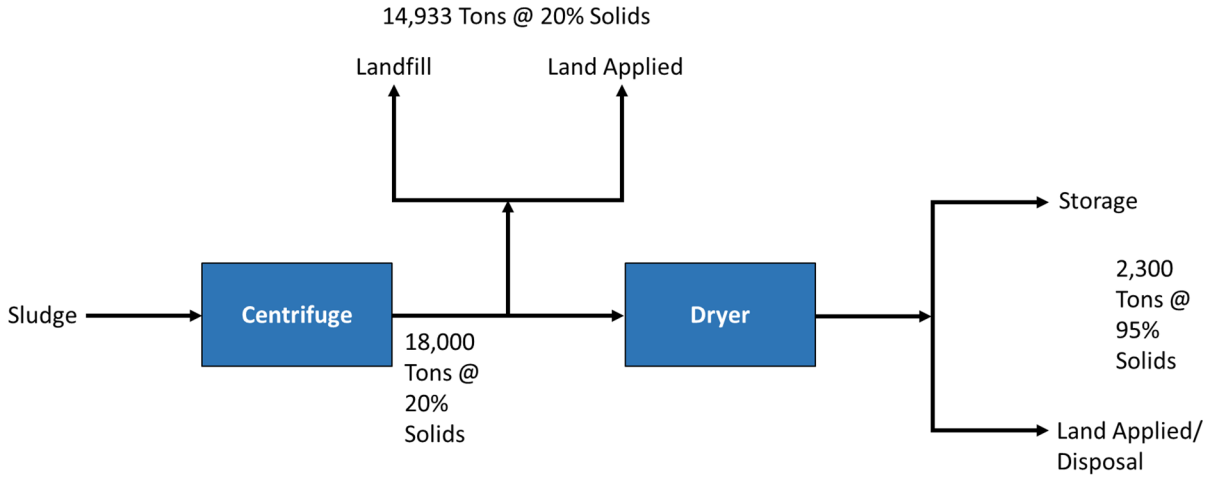


Figure 6

Biosolids Flow Diagram

On or near 2000, the Pottstown Landfill closed precipitating the need to look at alternate methods of biosolids disposal. Consequently in 2005, Pottstown Borough Authority's embarked on a capital improvement plan of $6.6 million to invest in upgrades related to the biosolids processing capabilities and

capacity including the construction of a new indirect thermal dryer. This effort reduces the biosolids volume being disposed, which in turn, reduces the disposal costs incurred by the Authority. PBA now has the flexibility to generate Class A material by utilizing a thermal dryer to destroy pathogens and reduce moisture content from roughly 80% to less than 5%. Appendix Q includes the 2012 Annual Report, Land Application of Biosolids indicating amount of Class A and B material generated.

Based upon information provided by PBA, 2013 sludge production and associated disposal costs were provided to determine the overall biosolids program costs. Table 18 below presents a breakdown of production and annual disposal costs.

Table 18

Class A and B Production and Annual Cost Summary

Wet Tons (Discharge from Centrifuge)	18,000	tons @ 20% solids
Class A	2,300	tons @ 95% solids
Class B	14,933	tons @ 20% solids
2013 Sludge Class B @ 20% Solids		
Class B Dry Tons	18,000	tons @ 20% solids
Avg Monthly Production (tons)	1,500	
2013 Sludge Class A @ 95% Solids		
Class A Dry Tons	4,500	tons @ 95% solids
Avg Monthly Production (tons)	375	
Centrifuge Cost	Annual Cost ($)	
Polymer	$ 230,000	
Electric	$ 30,000	
Maintenance	$ 100,000	
Digester Elec	$ 140,000	
Clean Tanks	$ 30,000	
Yearly Total	$ 530,000	
Dryer Cost		
Natural Gas	$ 310,000	
Electric	$ 110,000	
Maintenance	$ 350,000	
Yearly Total	$ 770,000	
2014 Biosolids Disposal Cost per ton	Unit Cost (1/ton)	
Class A Land App	$ 23.50	
Class B Land App	$ 38.50	
Landfill	$ 95.00	

The 2013 sludge production was plotted with considerations on the various percent solids available from each disposal option and treatment process. Table 19 summarizes the total costs associated with Class A and B generation. Figure 7 illustrates the annual biosolids disposal costs for Class A and B with the disposal options currently available. To be conservative, land application was limited to 6 months a year, with the remainder being disposed to landfill, operated and owned by waste management.

Table 19

Class A and B Total Cost Summary

Cost of Class B Sludge (6 month land applied, 6 months landfill)	
Centrifuge Cost	$ 530,000
Land App Cost	$ 346,500
Natural Gas (see note)	$ 100,000
Landfill Cost	$ 855,000
Total Cost	$ 1,831,500
Cost of Class A Sludge (6 month land applied)	
Centrifuge Cost	$ 530,000
Dryer Cost	$ 770,000
Land App Cost	$ 52,875
Landfill Cost	$ 213,750
Total Cost	$ 1,566,625
Cost of Class A Sludge (no disposal cost - Optimized)	
Centrifuge Cost	$ 530,000
Dryer Cost	$ 770,000
Land App Cost	$ -
Landfill Cost	$ -
Total Cost	$ 1,300,000

Note: Due to the contract with the gas utility, costs are incurred regardless if the dryer is in operation or not. Gas costs get allocated to the centrifuge unit process when the dryer is not in operation.

The pathogen destruction and moisture content reduction creates a significantly more marketable product, with the potential of a revenue generator. Successful biosolids management programs are a result of a consistent high quality product, sound marketing research, and the development of the strong public/private partnership. Many larger municipal agencies developed biosolids management programs and made capital investments into the production of Class A biosolids in the late 1980's and early 1990's to take advantage of the beneficial use markets. As public resistance to land application increased over the past 10 to 15 years, municipal agencies similar to the Pottstown Borough Authority have implemented or are investigating enhancements to their biosolids management programs.

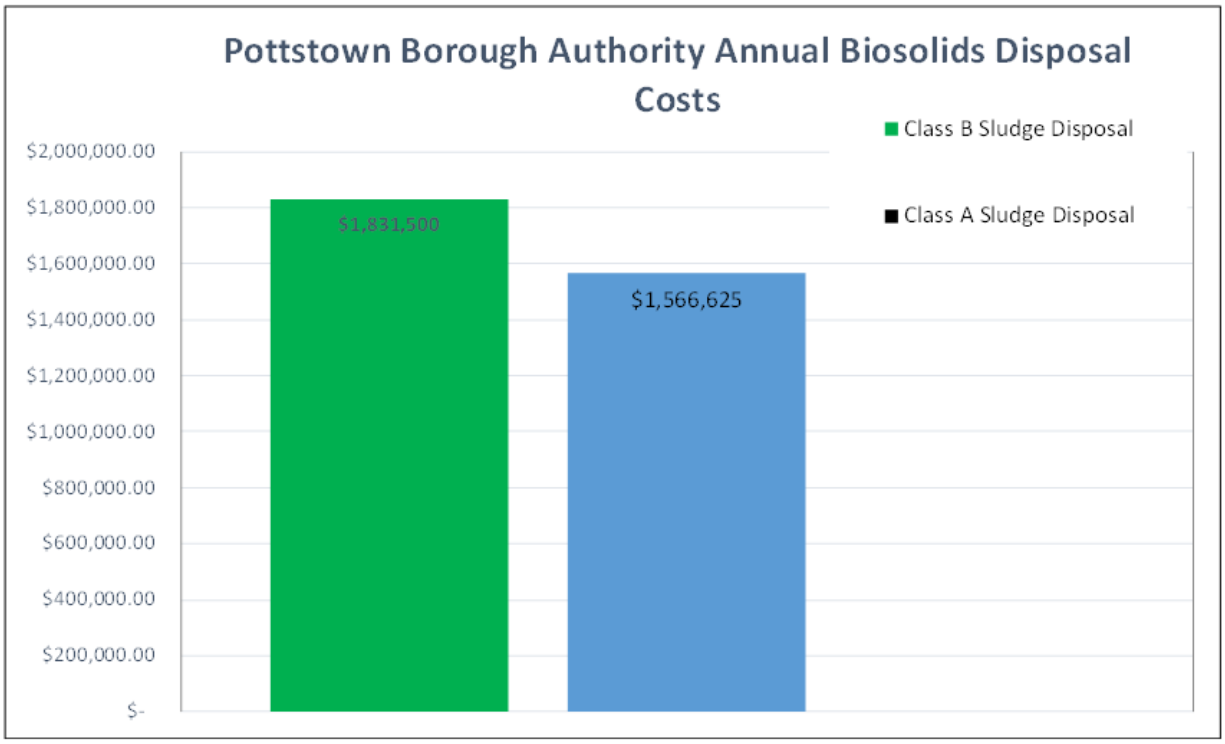


Figure 7

Annual Biosolids Disposal Costs

While the Pottstown Borough Authority, which discharge to the Delaware River basin, is not directly impacted by the Chesapeake Bay Restoration Program, Pennsylvania municipalities within the Bay drainage basin are taking closer looks at the impact of biosolids land application as it relates to nutrient management and Bay TMDL limits. The most likely result will be a reduction in land application rates to account for lower nitrogen and phosphorus with various clean bay and TMDL initiatives. The combined effect will result in reductions in agricultural land use, reductions in biosolids application rates, and public pressures opposing biosolids land application. This has the potential of Chesapeake Bay drainage basin biosolids migration into the Delaware River basin. This biosolids migration pressure will impact available sites and likely increase costs.

A good example of changing biosolids management occurring in Pennsylvania is the Lancaster Area Sewer Authority (LASA). LASA has begun the planning efforts to enhance its biosolids operations from a Class B lime stabilized product to a Class A product, which is very similar to the Pottstown Borough Authority's product. The LASA concept plan is projected to cost $20 to $25 million and will include the design and construction of anaerobic digesters, dewatering, and thermal drying facilities for its 15.0 MGD wastewater treatment facility. The driving factors that moved LASA to this decision are to produce a reliable, consistent, marketable and regulatory compliant biosolids product in an effort to continue beneficial use options.

A number of factors can affect the market factor of biosolids with the local environment. Often times this product can be a revenue generator for a municipality or at least with no disposal cost associated. This can greatly reduce the operating costs for this portion of the project. A no disposal cost was graphed (Figure 8) to relay potential savings versus current operations. This projected scenario is called Class A

disposal optimized. In the event PBA can find customers who are willing and able to take the Class A product, this will significantly reduce disposal costs by over $250,000/year ($1,566,625-$1,300,000). It is recommended that the Authority investigate if potential parties are amenable to this arrangement, to generate additional revenue and as to offset the operational costs.

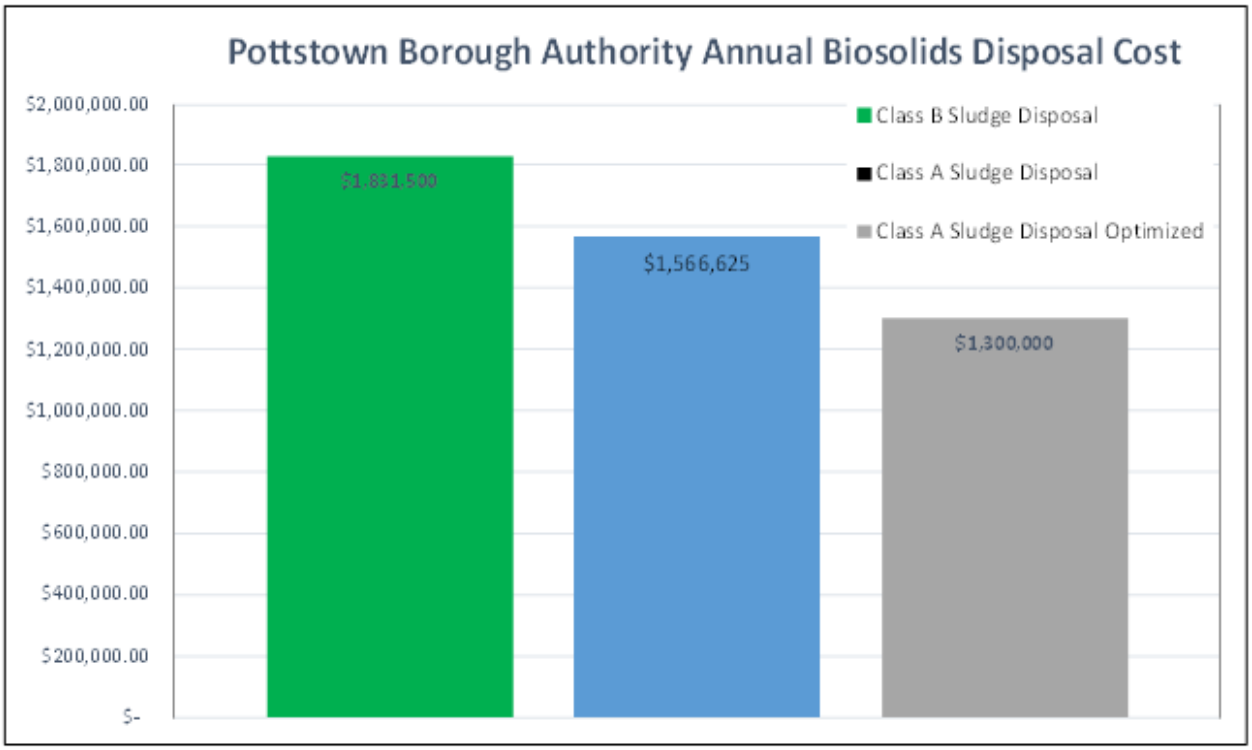


Figure 8

Class A Disposal Optimized

According to Figure 8, the disposal costs of generating Class B biosolids is 17% higher than the disposal of Class A Biosolids. The original basis for constructing the dyer was to provide a flexible option for sludge disposal that would not require the high cost and limited availability of landfill disposal. Therefore, it may be prudent that the Dryer be operated on a seasonal basis when the conditions are not acceptable for the disposal of Class B Biosolids. With operating the dryer for defined periods of the year, the life of the parts could possibly be extended and there would be a set time for in depth preventive maintenance, which would reduce the possibility of emergency repairs, during the times when the only disposal option would be to the landfill.

5. Efficiency of Plant Operations

To determine plant efficiencies, JMT evaluated each unit process. For example, regarding the aeration tanks, which have been retrofitted with fine bubble diffusers, we determined if they are being properly optimized. Questions and discussion points included:

- Do the aeration tanks have dissolved oxygen (DO) probes to monitor DO levels?
- Is the system being over aerated and/or over treating during the nitrification process?
- Are the blowers capable of automatic or manual airflow adjustments via (VFDs) or other means to optimize performance?

- How does the SCADA interface perform in terms of controlling and operating the blowers to optimize aeration process performance?

There is certainly a balance to meet the NPDES permit limits while not over aerating the tanks, which increases the electrical consumption and costs. We evaluated the blower operation and took inventory of the components. The JMT Team also reviewed the efficiency and costs of the gaseous chlorine facility as compared to other means of chlorination such as liquid chlorination and/or onsite generation of chlorine. We also reviewed the maintenance costs associated with the screw pumps to the final clarifiers, which have incurred high costs for rehabilitation and repairs.

Our financial expert evaluated operations in the following categories using the Qualserve[1] Benchmarking indicators: (a) Organizations Development: health and safety, training hours per full time equivalent (FTE), and million gallons per day (MGD) Qualserve of wastewater processed per employee, (b) Customer Relations: average bill, and (c) Wastewater Operations: wastewater treatment effectiveness rate; planned maintenance ratio, operations and maintenance costs per MG processed, and direct cost of treatment per MG processed.

Comparisons were made to national averages utilizing such databases as the American Water Works Association (AWWA)/Water Environment Federation (WEF) Benchmarking and the National Association of Clean Water Agencies (NACWA) database. Based upon available benchmarking data, we made comparisons to both similar sized facilities as well as facilities operating at similar technology levels.

Our evaluation report includes a table of comparable wastewater treatment plants with similar size, processes, and employees to compare staffing levels with the Authority's. This table includes flow (MGD) and type of treatment process with a staffing level comparison at the functional level with a breakdown in staffing by:

- Operations and Maintenance
- Biosolids Handling and Disposal
- Laboratory
- Administration
- Other

6. Maintenance Programs

a) Preventive and Predictive Maintenance

The concept behind predictive maintenance is that, in most operating environments, manufacturer's recommendations are very conservative. In predictive maintenance, operators monitor equipment (usually while it is running) to predict when maintenance will be needed. Typical predictive maintenance monitoring includes oil analysis, vibration sensors, heat detection, acoustics etc.

The Maintenance Staff consists of the Operations & Maintenance Manager, two Mechanics, and one Electrician who perform preventive maintenance at the wastewater treatment plant and the Borough's two pump stations.

[1] QualServe is a voluntary program designed specifically for water and wastewater utilities under continuous updating and improvement. The program was developed by the American Water Works Association (AWWA) and Water Environment Federation (WEF) in 1996 to assist utilities in performing self-assessments, peer reviews and benchmarking.

Operations & Maintenance Manager: We understand that the Authority does not currently utilize any maintenance management software systems at the plant. We recommend software and/or systems to improve overall management and efficiencies at the plant, so new maintenance management software should be considered. Without the availability of maintenance software program, the O&M Manager schedules all of the preventive and predictive maintenance at the wastewater treatment plant and performs the following tasks:

- Makes the daily work schedule for preventive maintenance based on BMP or manufacturers recommendations,
- makes the weekly work schedule for predictive maintenance based on BMP or manufacturers recommendations,
- prioritizes the work schedule daily and adjusts it to respond to immediate needs of failed equipment posted on the Operator's work board,
- oversees the gas chlorine injection facility, changing out gas cylinders when empty,
- responds to and correct gas chlorine leaks and/or emergencies,
- ensures the Mechanics use lock out and tag out safety procedures prior to working on any equipment

Mechanics: The Mechanics perform all of the preventive and some predictive maintenance at the wastewater treatment plant and performs the following tasks:

- inspect two off-site pump stations daily (Monday through Friday) and remove debris collected at the bar screen and/or baskets, alternate pumps, and log data in a log book,
- perform daily work schedule for preventive maintenance based on BMP or manufacturers recommendations,
- tag equipment with date and type of preventive maintenance performed,
- perform weekly work schedule for predictive maintenance (including vibration testing, infrared imaging, etc.) based on BMP or manufacturers recommendations
- the Mechanics use lock out and tag out safety procedures prior to working on any equipment

Electrician: The Electrician performs all of the preventive and some predictive maintenance on electrical equipment at the wastewater treatment plant and performs the following tasks:

- perform daily work schedule for preventive maintenance based on BMP or manufacturers recommendations,
- perform weekly work schedule for predictive maintenance based on BMP or manufacturers recommendations,
- The Electrician uses lock out and tag out safety procedures prior to working on any electrical equipment

Table 20 on the following page demonstrates preventive, predictive, and reactive maintenance performed or practiced at the facility over the years according to PBA plant staff. Predictive maintenance is to monitor a piece of equipment while the unit is operational. Preventive maintenance is to service a piece of equipment per manufacturer's recommendations when it is shut down, like changing the oil in your car every 3,000 miles whether the unit really needs it or not. It is reactive maintenance when the unit shuts down and fails and is offline for a period of time until it is repaired. The maintenance tasks presented in Table 19 are more preventive in nature. The goal is to perform more predictive maintenance particularly on high maintenance items such as the dryer and centrifuges. With regard to the centrifuges, PBA "ships out" the units for rebuilding and servicing on an annual basis.

Table 20
PBA WWTP: Maintenance History and Schedule

EQUIPMENT	TASK	PREDICTIVE	PREVENTATIVE	EMERGENCY REACTIVE	IMPROVE MAINTENANCE	SPARE PARTS
Bar Screen 1	Replaced bars with stainless steel, improved scrapers, structure redone with stainless steel, painted with cold tar, greased and changed oil	X	X	X	X	X
Bar Screen 2	Replaced bars with stainless steel, improved scrapers, structure redone with stainless steel, painted with cold tar, greased and changed oil	X	X	X	X	X
Comminutor 1	Installed new communion after 20 years in operation because the shell of unit rusted away, greased and changed oil	X	X			X
Comminutor 2	Installed new communion after 20 years in operation because the shell of unit rusted away, greased and changed oil	X	X			X
Pre-aeration Tanks	Clean aerated grit chamber twice per year, replaced diffuser system to help with settling of grit out	X	X		X	X
Thickener	Installed new polymer pump system and storage tank and installed new feed pumps with grinders on them	X	X	X	X	X
Rotary Drum	New rotating drum, will perform total overhaul 2014, new larger gear box, new bearings, new spray system, installed booster pump, greased and changed oil	X	X		X	
Thickener Conveyor	Thickener conveyor removed and installed PVC conveyor system with no mechanical parts due to conveyor in need of replacement since it was over 20 years old and rusted beyond repair	X			X	
Positive Displacement Blower A	Removed from operation due to it is not needed					
Positive Displacement Blower B	New 2010, high air rates, on vide; grease and change oil		X			
Positive Displacement Blower C	New 2010, high air rates, on vide; grease and change oil		X			
Positive Displacement Blower D	New 2010, high air rates, on vide; grease and change oil		X	X		
Centrifugal Blower A	Grease blower and change oil		X			
Centrifugal Blower B	Grease blower and change oil		X			
Centrifugal Blower C	Grease blower and change oil		X	X		
Centrifugal Blower D	Grease blower and change oil		X	X		

Table 20 (continued)
PBA WWTP: Maintenance History and Schedule

EQUIPMENT	TASK	PREDICTIVE	PREVENTATIVE	EMERGENCY REACTIVE	IMPROVE MAINTENANCE	SPARE PARTS
Aeration A	Clean tanks and flex diffusers		X			X
Aeration B	Clean tanks and flex diffusers		X			X
Aeration C	Clean tanks and flex diffusers		X			X
Aeration D	Clean tanks and flex diffusers		X			X
Aeration E	Clean tanks and flex diffusers, installed new diffusers	X	X		X	X
Aeration F	Clean tanks and flex diffusers, installed new diffusers	X	X		X	X
Aeration G	Clean tanks and flex diffusers, installed new diffusers	X	X		X	X
Aeration H	Clean tanks and flex diffusers, installed new diffusers	X	X		X	X
Screw Pump A	Grease and change oil	X	X			X
Screw Pump B	Grease and change oil, replace up bearing, and repair steel	X	X	X	X	X
Screw Pump C	Grease and change oil	X	X			X
Screw Pump D	Grease and change oil	X	X			X
Screw Pump E	Grease and change oil	X	X			X
Clarifier A	Grease and change oil, rebuild gear box and paint weirs	X	X			X
Clarifier B	Grease and change oil, rebuild gear box and paint weirs	X	X			X
Utility Water Pump 1	Replaced new water pump 2011	X	X			X
Utility Water Pump 2	Replaced new water pump 2011	X	X			X
Lower Pump House Pump 1	Rebuild pump with new impeller 2012	X	X			
Lower Pump House Pump 2	Rebuild pump with new impeller 2013	X	X			
Memorial Park Pump Station Pumps		X	X	X		
Memorial Park Pump Station Bar Screen		X	X			X

Table 20 (continued)
PBA WWTP: Maintenance History and Schedule

EQUIPMENT	TASK	PREDICTIVE	PREVENTATIVE	EMERGENCY REACTIVE	IMPROVE MAINTENANCE	SPARE PARTS
Memorial Park Pump Station Comminutor		X	X			
Circle of Progress Pump Station Pumps		X	X			
Centrifuge 1	Rebuild annually, grease and change oil	X	X	X		X
Centrifuge 2	Rebuild annually, grease and change oil	X	X	X		X
Thermal Dryer	Grease and change oil, check paddles for wear	X	X	X	X	
All Conveyors	Checked yearly to determine replacement, grease and change oil	X	X	X	X	X
Boiler		X	X	X	X	X
Digester ET-5	New diffusers, cleaned every 5 years	X	X	X	X	X
Digester T-5	New diffusers, cleaned every 3 to 5 years	X	X	X	X	X
Bulk Pump Station Pumps		X	X			X

b) Reactive Maintenance

The Maintenance Staff responds to failed equipment notifications from the Operator's Work Board to repair or replace failed equipment. The Utilities Director prioritizes all maintenance repairs with the O&M Manager that mostly depends on the immediacy of the failed equipment's need to return to service for continual processing of the wastewater.

The implementation of a strong preventive maintenance strategy by the Maintenance Staff has significantly reduced emergency call outs. The planned maintenance and servicing of the equipment by the Maintenance Staff has not only reduced emergencies, but saved major dollars by repairing or upgrading the existing equipment in-house, and (by getting more years out of the equipment) increasing the life expectancy past its expected date of replacement.

Though there is no priority spare part list, the maintenance staff does maintain a significant number of spare parts of major equipment to prevent long-term shutdown of the treatment process. To aid the Maintenance Staff, the JMT Team recommends:

- a computerized inventory of priority or major spare parts,
- a computerized maintenance software to provide a scheduled routine preventive maintenance on the equipment based on manufactures recommendations, and
- an asset management plan of equipment with life expectancy, replacement costs in future dollars and a planned replacement schedule

The following is a list of "High Maintenance Items" that are being addressed by operations:

- *Centrifuges* – Annually servicing the centrifuges (by the manufacturer) preventing long-term shut downs for non-planned emergency repairs that is critical for processing biosolids.
- *Thermal Dryer* – This high maintenance process item requires much attention because of normal wear and tear with high temperatures that breakdown internal parts that is critical for processing Class A biosolids which, in return, provides significant savings in terms of disposal costs.
- *Screw Pumps* – These high maintenance items are costly to repair and/or replace.

The JMT Team established a baseline describing current maintenance practices. Roles and responsibilities of plant staff were defined with regards to maintenance. We evaluated years of documentation to provide a fair assessment of the existing maintenance program then make recommendations for improvement. For example, we evaluated the maintenance costs associated with high maintenance items (i.e. screw pumps) as well as other plant unit process.

Plant maintenance and upkeep is a good indicator of overall plant management (a well operated plant will be well maintained and orderly looking). In the process of reviewing more than 200 plants, we have developed a 30 point scale for evaluating plant maintenance and identified best practice ratings in each category.

Next, the JMT team determined if outsourcing specific maintenance tasks to an outside service company, manufacturer or shop is practical and cost effective. One factor depends upon the level of sophistication, level of training and skill set possessed by the Authority's maintenance staff. This may include outsourcing several work activities including mechanical equipment repairs, electrical equipment repairs, painting, landscaping, etc. Currently, only lawn mowing and specialty samples are outsourced.

In terms of benchmarking, we provided an analysis of maintenance logs and review of maintenance software to determine the effectiveness of maintenance practices. Metrics include:

- Benchmark ratio planned to unplanned work (hours and $)
- Analyze maintenance logs to determine the effectiveness of maintenance scheduling – identify equipment that needs to be rehabbed or replaced, identify adjustments in maintenance scheduling strategy

- Review the effectiveness of any Computerized Maintenance Management Systems or Work Order Systems.

7. Laboratory Sampling and Analysis

PBA's onsite PADEP accredited laboratory performs all process control analysis and daily-required DMR analysis, except for total phosphorus and total dissolved solids that is outsourced to a PADEP accredited laboratory for analysis. Lab staff is described as follows:

Laboratory Manager: The Laboratory Manger oversees or performs the following tasks:

- makes up the weekly work schedule including holidays and vacations,
- orders laboratory's chemicals and supplies and maintains a workable inventory,
- makes up solutions and standards for laboratory testing,
- manages all outsourced sample collection and analysis,
- every 60 days, collect and submits sludge samples to Penn State for Analysis, and MJ Reider for fecal coliform and in-house sour test on sludge from digester E-T5,
- creates and manages log books, log in numbers,
- oversees calibration of all laboratory instruments,
- troubleshoots and repairs laboratory instruments,
- attends PADEP inspections and responds to all regulatory correspondences,
- provides laboratory summary by transposing data to the monthly DMR,
- oversees all of the sample collection and analysis procedures performed in-house,
- annually performs quality control analysis,
- backup MIPP inspections and sample collections, and
- backup FOG inspections.

Laboratory Analysts: Two Laboratory Analysts work the first shift Monday, Tuesday and Wednesday, and alternate Thursday and Friday with Saturday and Sunday. The Laboratory Staff collects and analyzes the following samples daily:

- chlorine, residuals of chlorine contact and de-chlorination tanks,
- pH and fecal coliform of the totalizer/parshall flume, and
- pH, chlorine residual, dissolved oxygen and ammonia nitrogen of the manhole outfall 001.
- calibrates the instruments and records calibration data in a separate log book daily,
- records laboratory analysis in separate log books daily, and
- 3 days per week, perform site inspections of FOG customers' facilities out in the system.

Sample Collection and Analysis: The Operators collect process control samples and composite samples, but only perform chlorine residual and pH analysis on the process samples. The Laboratory Analysts collect and perform laboratory analysis on permit-required samples using Standard Methods for all analysis. M. J. Reider, a PADEP certified laboratory, performs the following analysis for DMR reporting:

- Influent (once per week) – total dissolved solids, total phosphorus
- Effluent (daily) – total dissolved solids
- Effluent (once per week) – total phosphorus
- Quarterly Sampling:
    - 1st quarter – dryer cake, centrifuge centrate and centrifuge cake
    - 2nd quarter – bulk density of dryer and centrifuge cake, Form 43 of screenings and grit, dryer cake and centrifuge cake. Prior pollutant Scan on the influent dryer cake and centrifuge cake
    - 3rd quarter – dryer cake, centrifuge centrate and centrifuge cake

- 4th quarter – dryer cake, centrifuge centrate and centrifuge cake
- Fall – Form 26R of dryer and centrifuge cakes

Table 21 below presents the parameters analyzed by laboratory staff on a weekly basis.

Table 21

PBA Laboratory Analysis Weekly Schedule

POTTSTOWN WWTF LABORATORY ANALYSIS WEEKLY SCHEDULE

(Test run daily and how many of each)

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
pH=10	pH=6	pH=10	pH=6	pH=10	pH=6	pH=10
Fecal Coliform=1	Fecal Coliform=1	Fecal Coliform=1	Fecal Coliform=1	Fecal Coliform=1	Fecal Coliform=1	Fecal Coliform=1
Cl2 Residual=4	Cl2 Residual=4	Cl2 Residual=4	Cl2 Residual=4	Cl2 Residual=4	Cl2 Residual=4	Cl2 Residual=4
NH3(nessler)=2	NH3(nessler)=2	NH3(nessler)=2	NH3(nessler)=2	NH3(nessler)=2	NH3(nessler)=2	NH3(nessler)=2
NH3(NPDES)=0	NH3(NPDES)=29	NH3(NPDES)=0	NH3(NPDES)=0	NH3(NPDES)=0	NH3(NPDES)=0	NH3(NPDES)=0
TSS=11	TSS=12	TSS=20	TSS=12	TSS=13	TSS=12	TSS=12
Total Solids=5	Total Solids=6	Total Solids=8	Total Solids=6	Total Solids=6	Total Solids=5	Total Solids=5
Volatile Solids=4	Volatile Solids=0	Volatile Solids=0	Volatile Solids=5	Volatile Solids=0	Volatile Solids=0	Volatile Solids=0
BOD=7	BOD=7	BOD=7	BOD=7	BOD=7	BOD=7	BOD=7
CBOD=15	CBOD=15	CBOD=15	CBOD=15	CBOD=15	CBOD=15	CBOD=15
TS for Sludge=10	TS for Sludge=8	TS for Sludge=8	TS for Sludge=8	TS for Sludge=13	TS for Sludge=1	TS for Sludge=0

**Total Solids testing for sludge varies widely from week to week depending on how many loads are being brought in. Sludge loads from a single source are composited daily and set up as one test. The numbers listed for sludge are total tests set up, not the total loads brought in for that day.

***The numbers shown are for the week of May 12th through May 18th.

****Lab Analysts also do about 15 to 20 FOG inspections weekly.

III. BOROUGH OF POTTSTOWN AND ADJACENT MUNICIPALITIES

JMT reviewed the collection and conveyance system protocols for each of the contributing Townships and the Borough including operations and maintenance programs for the wastewater pumping stations (PS). Appendix R provides the overall sanitary system map for both Pottstown and the adjacent municipalities. Each contributing municipality experiences high Inflow and Infiltration (I/I) to varying degrees of severity with large peaking factors affecting both the performance of the conveyance system and receiving wastewater treatment plant. JMT reviewed various pieces of information supplied by the municipalities that described their system and means by which the system is maintained and how they are dealing with the significant I/I issues. In addition, our team inspected ten (10) pumping stations to understand the history of the station; O&M related issues; and metering capacity.

Continuing to treat high wet weather flows at the wastewater plant exposes PBA to potential process failures at the facility leaving them susceptible to notice of violations (NOVs) by PADEP and possible monetary fines. JMT evaluated current I/I practices of each municipality based on the information supplied as listed in Appendix B versus best management practices by other utility owners, including options to combine services among the utility owners to achieve an economy of scale savings.

JMT recognizes the issues and cost implications facing utility owners in dealing with I/I and the associated complications in finding and removing its sources. Sources of I/I consist of defects in the mainline pipes, manholes or building laterals as well as illicit stormwater connections from basements, roof drains or storm drains. Based on our understanding of the total system, wastewater flow rates rise dramatically during wet weather events thus validating the level of I/I and specifically that in which directly results from rainfall or rain-derived inflow and infiltration (RDII). Additionally, we recognize the serious implications of the Corrective Action Plan (CAP) requirements placed by PADEP on Upper and Lower Pottsgrove Townships to mitigate I/I. Lower Pottsgrove is under a PADEP imposed CAP since their exceeded their allocated flow capacity per the Chapter 94 report and Upper Pottsgrove is under a CAP as imposed per the PBA Sewage Treatment Services Agreement because they exceeded their allocated capacity per the agreement.

In terms of conveyance, the JMT team inspected each of the ten (10) pump stations owned and maintained by the various municipalities. These pump station names and flow rates are indicated in Table 22. These stations vary tremendously in size, condition, and O&M and are discussed in more detailed in subsequent portions of this Section. Appendix S includes the completed JMT pump station inspection forms from our site visits.

Table 22 - Wastewater Pump Station Summary

Municipality Name	Pump Station Name	Flow(Q)	Comments
Pottstown	WWTP Influent Memorial Park Circle of Progress	12.4 MGD 10.0 MGD Small	 New meter planned New meter planned
Lower Pottsgrove	Porter Road Sanatoga Villa Drive	13.0 MGD** 3.17 MGD** 0.17 MGD	New Force Main
Upper Pottsgrove	Pine Ford Road Regal Oaks	0.078 MGD* 0.54 MGD	
West Pottsgrove	Grosstown Road Old Reading Pike	0.29 MGD** 0.81 MGD**	No Meter

*Flow Rate provided by UPT (average based on 42 months of data)
** Peak Flow Rate

According to the information provided to JMT and research on each utility owner, each of the four municipal collection systems is owned and operated separately. These systems are generally gravity systems with a few pump station and force mains included for conveyance. Table 23 highlights each municipality's infrastructure characteristics in terms of collection and conveyance systems indicating length of pipe, diameter, manholes, pump stations and points of interconnection into the Borough's system:

Table 23 - Collection System Summary

Municipality Name	Pipe Length (miles)	Pipe Diameter Range (inches)	Manholes	Pump Stations	Connections to Pottstown's System
Pottstown	72	6 – 36	1,604	3	--
Lower Pottsgrove	48	6 – 30	1,303	3	7
Upper Pottsgrove	13	8 – 18	427	2	6
West Pottsgrove	11	8 – 12	228	2	2

A. Borough of Pottstown

1. Collection and Conveyance Systems

a) System Characteristics:

The Sewer Collection Division within the Public Works Department maintains and operates the Borough's collection system. The collection system consists of 72 miles of sewer pipe ranging in diameter from 6 to 36-inches, with approximately 1,600 manholes. The Sewer Collection Division utilizes a Borough-owned closed circuit television (CCTV) truck that is capable of inspecting the internal condition of sewer pipes. The Department employs two operators that are trained to operate and maintain the CCTV truck and its association equipment. This crew of two operators responds generally to resident complaints; however, the Borough solicits bids from outside contractors for larger projects due to the limitations of one crew and their other maintenance and customer response responsibilities. In addition, the Department does not own a jetting and vacuum truck to clean the pipes which limits some of the crew's capabilities in lines with debris, roots, grease, and sediment. When these situations are encountered, the Borough is forced to contract out this work.

b) I/I Program:

The Borough has a six step I/I program that identifies methods to reduce the amount of I/I in the collection system. This program includes the following:

1. Investigation of sewer complaints – if a sewer complaint is submitted, sump pump discharges are checked on the property, rain leaders are examined to determine discharge point, and laterals are inspected for defects.
2. Sewer mains are televised and repairs are prioritized based on the severity of the defects found.
3. When new sewer mains are installed, sewer laterals are inspected and if found in poor condition the property owner is given notice that the lateral must be replaced.
4. Public Works utilizes portable flow meters to identify high flow conditions; once these areas are identified, the mains are televised for conceivable causes.
5. Sewer manholes are inspected for signs of leakage around the frame, brick, and pipe penetrations. If leakage is found, sealing form is used to prevent future leakage. If warranted, the frame and cover is replaced or a manhole insert is utilized if the lid is properly fitting on the frame.
6. Sewer vents along curb lines are inspected for potential inflow and may be plugged if conditions allow.

During 2013, the Borough's routine maintenance consisted of the following:

- Sewer Cleaning – 25,887 LF (System Percentage – 7% : 14.7 year cycle)
- CCTV Inspection – 7,360 LF (System Percentage – 1.9% : 51.4 year cycle)
- Root Cutting – 1,640 LF

In addition, the Borough conducted inspections and coordinated necessary repairs due to sewer backups on 95 residential properties and nine Borough-owned properties. In addition, as part of a preventative maintenance program, the Public Works replaced 70 manhole frame and lids each year within the collection system. The frame and lids are replaced due to badly worn lids, which helps to reduce the number of riser rings that were installed over the years. With the reduction of riser rings, the amount of I/I can be reduced. As reported by the Public Works, sewer main replacement projects are beyond the resources of the department and are contracted out as needed.

c) Pump Stations:

In addition to operating and maintaining the Wastewater Treatment Facility, the PBA also operates and maintains three wastewater pump stations, Memorial Park pump station, Circle of Progress pump station, and the influent pump station to the treatment facility. The pump stations are described as follows:

1. Memorial Park Pump Station:
   The Memorial Park PS located on West King Street collects flows from portions of the Borough and portions of the West Pottsgrove Township. The station pumps flow through a 30-inch diameter force main discharging directly into the headworks of the wastewater treatment facility. The pump station consists of four pumps with an average pumping rate of 1,800 gallons per minute (gpm) each. The station has an average pumping rate of 1.0 MGD with a maximum of 10.0 MGD. The effluent meter at the station is inoperable. The station has a back-up diesel generator for emergency power supply and can last up to 3-4 days. The station includes bar screens and a comminutor that runs continually to remove large debris prior to the flow entering the wet well.

2. Circle of Progress Pump Station:
   The Circle of Progress PS located on Circle of Progress Drive collects flows from the business park it resides in. The pump station consists of two pumps each with pumping capacity of 0.86 MGD. The sewage is pumped through a 4-inch force main which eventually flows into the Memorial Park PS. The upstream screening consists of a trash basket that must be maintained approximately once a month. A diesel generator provides back-up power to the station when power is lost. There is no current effluent meter at the pump station; however, the Authority is currently implementing a project that will add a mag-meter on the effluent pipe. We also understand that the main contributor to the pump station, Sly Fox Brewery, will be increasing their beer production by 30% over the next 5 years which will presumably, increase flows to the sanitary pump station.

3. Influent Pump Station to Treatment Facility:
   See Section II.B.1.a for the Influent Pump Station description and findings.

d) Findings

Overall, on a rating of 0 to 5, with 5 being the best, we rate the PBA I/I program at a 1. The Borough's existing plan does not include a comprehensive analysis of the I/I problems such that the most severe areas are targeted first. The first line item of the program addresses resident complaints, which while important, may not be related to I/I elimination. Moving forward, we recommend that the Borough implements a more cohesive and comprehensive I/I program tailored to meet PBA's financial capabilities. The Borough's current I/I program utilizes a reaction approach to system problems and is not a sustainable I/I program. At a minimum, the program should include the following elements:

- Flow and Rainfall Monitoring Program - A flow and rainfall monitoring program would aid the Borough in understanding the impacts to the sewer system during wet weather events and identify those portions of the collection contributing the highest amounts. It could also assist in quantifying the amount of flow from each contributing township to better document the quantity of receiving flow.
- Hydraulic Modeling – A hydraulic model would utilize the information from the flow monitoring and rainfall analysis to predict bottlenecks in the system as well as illustrate the impacts of I/I reduction in those areas. This step would be more appropriate for a capacity evaluation of the system but is also useful in an I/I removal program to weigh the cost/benefits of I/I removal versus capacity upgrades.
- Sewer System Evaluation Survey (SSES) Program – A SSES program will help the Borough in understanding the sources of the I/I and allow the Borough an opportunity for "quick wins" and possibly locating major contributors; e.g. storm water cross connections, storm drain connections,

etc. A typical SSES program would consist of the following evaluation techniques and prioritized in the same order:

- Smoke testing – least expensive technique which may locate large contributions of illicit stormwater flows. Costs range from $0.50 to 0.75 per foot depending on amount tested.
- CCTV inspections – once the targeted areas have been located from flow monitoring, CCTV inspections should be pinpointed to those areas. CCTV inspections should be PACP compliant. Costs range from $1.50 to $5.00 depending on varying factors including pipe diameter.
- Manhole inspections – Manhole inspection should be MACP compliant and may range in costs from $90-$175 per manhole for full-descent.
- Dye water testing – Typically used to support smoke testing. Cost will vary greatly.

SSES programs can range in cost and time depending on the scope of the project; however, a flow monitoring program and comprehensive approach will dictate where an SSES program is most effective.

- Prioritization of Rehabilitation Areas – Based on the findings of the SSES program, PBA would identify the highest priority areas first based on the severities of system defects located and potential impacts of I/I. Rehabilitation could include a vast array of improvements including: trenchless rehabilitation of mainline pipe and laterals, dig and replace pipe replacement, manhole sealing, etc.
- Rehabilitation Effectiveness Monitoring – To measure the effectiveness of PBA's I/I removal program, the Authority should consider flow monitoring of the targeted areas both prior to and following rehabilitation. This would allow PBA to take credit for their I/I removal by illustrating the percentage of I/I removal from their system.

NOTE: PBA and surrounding Townships could utilize a cost savings approach to I/I removal by utilizing a single contract for various services, such as flow monitoring or SSES investigations, to achieve an economy of scale savings.

In addition to comments regarding I/I, the Borough should consider the purchase of a Jet/Vacuum truck to aid in maintaining their infrastructure. This truck should be sufficient to clear roots, debris and grease from the system to adequately inspect the interior of their pipe. With this equipment on hand, the Borough should develop a maintenance program to flush there system over a period of specified years and identify trouble areas that may require more regular intervals. This may eliminate systemic resident complaints and provide a higher level of service to PBA's customers.

We would also recommend following with respect to PBA's pumping stations:

- Memorial Park Pump Station
  - Install an effluent flow meter to enable PBA to better understand the flows conveyed to the Treatment Facility from this area.
  - Install a macerator at the influent to the wet well (i.e. Muffin Monster ®) to reduce pump clogging and accumulation of solids in the station.
- Circle of Progress PS
  - Perform a feasibility study to assess the need to expand the pumping station to accommodate the pending Sly Fox Brewery growth expansion.

B. Lower Pottsgrove Township

1. Collection and Conveyance Systems

a) System Characteristics:

Lower Pottsgrove Township (LPT) provides wastewater collection within the Township and conveys the sewage to the Borough for treatment and disposal. LPT's collection system consists of 48 miles of pipe ranging from 6 to 30-inches in diameter, and maintains approximately 1,300 manholes. Additionally, LPT owns and operates three pump stations; Sanatoga Lake, Villa Drive, and Porter Road.

b) I/I program:

LPT is currently in year seven of their CAP under PADEP and is focused on reducing the amount of I/I in their system. LPT utilizes a flow monitoring program to determine the effects of wet weather events on the collection system and prioritize target areas for rehabilitation. LPT relocates the flow meters as needed to focus efforts on known problem areas within the Township. From the information provided, LPT has been performing system rehabilitation to eliminate I/I from their system that includes the following:

- Manholes – The Township has made an effort to reduce the amount of I/I within manhole structures by utilizing manhole inserts (see Figure 9) to receive I/I reduction credits from PADEP. In addition, LPT inspects manholes are also inspected for defects and repairs are made based on the defects found.

Figure 9
Manhole Insert

- Lateral Repairs – Cleanouts/vents on private laterals have been raised throughout the Township to aid in the reduction of I/I into the system. Additionally, property inspections have been conducted in areas of suspected illicit sump pumps, floor drains, and downspouts that are connected to the sewer system. The Township also sent informational letters to residents regarding illicit connections and indicated they would perform dye testing on properties with such suspected connections to confirm the connection.
- Mainline Sewer Repairs – The Township utilizes CCTV inspection to identify defects throughout the collection system. If defects are found, repairs are made as necessary employing numerous repairs methods.

In addition, the CAP addresses insufficient pumping capacities at both the Porter Road and Sanatoga Lake pump stations. This led to the installation of VFD's at the Porter Road pump station as well as emergency diesel pump systems at both facilities.

During the April 30, 2014 rain event, the three (3) large force mains from Lower Pottsgrove reportedly pumped at a flow rate of 11,902 gpm (or 17 MGD) to the plant. A large portion of this flow enters the WWTP through the 3rd channel in the Grit Room. However, by a subsequent ordinance, Pottstown now has stipulated that Lower Pottsgrove cannot exceed a peak pumping rate of 11,800 gpm. In review of the

flow data from April 30 2014, it appears that Lower Pottsgrove controlled their pumps to a maximum flow of 11,800 gpm in compliance with Pottstown's ordinances. According to the Township, magnetic flow meters exist on all force mains at the Porter Road and Sanatoga Road pump stations. Additionally, the Township as indicated that they are currently procuring services to install magnetic flow meters on the force main at the Villa Drive pump station. The meter should be operational by October 2014. The JMT team questions why 11,800 gpm was used as the peak allowable flow that the PBA would accept at the plant given the high amount of I/I present throughout the system.

c) Pump Stations:

1. Sanatoga Lake Pump Station:
   The Sanatoga Lake pump station is located along South Sanatoga Road and serves the surrounding residential communities. The pump station consists of three 75-hp submersible pumps rated at 1,500 gpm each that flow through a 16-inch diameter force main and is combined with the discharge from the Porter Road Pump Station. Average flow for this pump station is approximate 0.43 MGD. The peak design flow for this pump station is approximately 3.17 MGD. These flows are then transported to the wastewater treatment facility. As part of the CAP PADEP placed on the township, the pump station includes a 3,000 gpm Godwin diesel wet-weather pump. In addition, there is a connection ban upstream of the pump station due to its capacity constraints. Currently the pumping station does not have flow metering capabilities. The Township has a current project that will increase the capacity of the pumping station utilizing 125-hp pumps . The backup diesel generator is exercised on a weekly basis as routine maintenance. Currently the pumps are controlled using a bubbler system with no level control redundancy.

2. Villa Drive Pump Station:
   The Villa Drive pump station is located along Villa Drive and serves the residential development for which it resides. The pump station consists of two 7.5hp grinder pumps that flow through a 4" diameter force main conveying flows to the Porter Road pump station. Each pump is rated at 100 gpm with no metering capabilities on the effluent. The pump station has no upstream screening prior to entering the wet well. The station does not have a backup generator. There is a current project to add a backup float system to supplement the current transducer that operates the pumps.

3. Porter Road Pump Station:
   The Porter Road PS is located along Porter Road and serves a large portion of the LPT and portions of the Borough. The pump station consists of four (4) pumps: two 60-hp pumps and two 200-hp pumps plus three (3) force mains: two 18 inch lines and a 10 inch line. In addition, the pump station has an emergency standalone wet-weather diesel pump. Harmonic filters are utilized to help clean the electricity prior to sending power to the VFDs; these filters will assist in extending their service life. On average, the station conveys approximately 1.4 MGD and peaks to 13 MGD during wet weather events. It is important to note that flow is collectively measured downstream of the junction of the Porter Road pump station and the Sanatoga Lake station, and individually at the Sanatoga Lake pump station to determine flows at each station.

   The pump station has three (3) force mains leaving the station that include one 10-inch and two 18-inch pipes that are directly connected to the head works of the treatment facility. The Sanatoga PS force main connects to one of the 18-inch force mains (the old line) located adjacent to the pump station building. During normal operations (dry-weather), the pump station utilizes one 18-inch force main; as flow increases, the other 18 inch line activates. Only 2 pumps can run at one time. The 10 inch line is used to alternate or supplement with the other 18 inch lines as needed. The new (2011) 18 inch force main has a control valve that modulates flow and is set such that the maximum flow cannot exceed 11,800 gpm per the agreement. The pump station does not have a typical wet well, as the sewage enters the building via a 30-inch pipe and collects in a small wet well downstream of the channel. From discussions with the station operator and review of the plans, the pump station is demanding from an operations standpoint, primarily due to a lack of wet-well storage, the amount of

discharge pipes (10 inch FM, 18 inch FM and 16 inch FM coming from Sanatoga PS) plus the amount of valves and controls needed to operate the station.

d) Operations Staffing

LPT employees two full-time employees (FTEs) to operate and maintain its 48-miles of sanitary collection sewer system. In the management of the collection system, LPT uses a combination of their in-house staff and contractors. As part of our discussion some information was conveyed regarding the responsibilities of the collection system staff and the perceived volume of activity. We were asked if other systems operated at a level of one FTE per 50 miles.

Benchmarking collection system staffing only (i.e., no treatment plant) poses a number of problems:

- Such systems are owned by units of government (cities, towns or townships) and typically are part of a public works organization.
- Staffing information conveyed in organization charts are likely to be unreliable because collection system staff is often borrowed for other functions such as snow removal, street work, etc.
- The mix of in-house work vs. contracted work will affect staffing levels.

One way of avoiding the problem of borrowed staff is to focus on separate systems, such as authorities or sanitary districts. However, even here, there is likely to be some staff borrowing or overlap that occurs.

Table 24 presents some collection system benchmarking for systems in states with similar weather conditions and collection systems between 16 and 203 miles. In addition, some collection system staffing data is presented for Pennsylvania systems whose treatment plants are comparable in size to PBA and have collection systems within the same size range. Some observations include the following:

- Two of the systems had FTE/50 mile ratios of less than one.
- There are other systems in the National Association of Clean Water Agency data base that have FTE/50 mile ratios of between one and two.
- We are also aware of some government owned collection systems in this size range that may show 2 or more collection system personnel, but, because of borrowing, effectively have only one FTE.
- Great Neck, the one outlier on the following table, has an extremely high level of maintenance (they CCTV their system every 2 years) and a very active FOG program which utilizes collection system personnel. They provide tertiary treatment as well.

Table 24 - Collection System Benchmarking

Utility	Retail Population Served	Sewer Length (Miles)	Collection FTE	Collection FTE per 50 Miles	Comment
Lower Pottsgrove	13,000	48	2	2.08	No treatment plant
City of Ames IA	58,965	203	3.6	0.89	--
Great Neck WPCD NY	15,000	45	4	4.44	--
City of Lebanon OH	20,500	110	2	0.91	--
Valley Forge	22,000	90	3	1.66	Utility also owns plant
Exeter Township	25,600	105	2	0.95	Utility also owns plant

Keeping in mind the difficulties in comparing collection system staffing (borrowing of staff, the difficulties in finding highly comparable systems) the answers to the questions posed by LPT are below:

1. Do other systems operate their collection systems with 1 FTE/50 miles?

- Systems can operate at lower levels of collection system staffing (FTE/50 miles) than LPT currently has. Some systems appear to be working well at a level of around 1 FTE/50 miles.

2. Could LP operate its collection system with one FTE?

- Based on your reported mix of in-house and contracted work and reported level of activity for in-house staff LPT should be able to operate at less than 2 FTE/50 mile.
- Although some small systems actually operate with 1 or close to 1 FTE per 50 miles of collection system, all but one of the systems we analyzed report having 2 FTEs (even though some of their time is likely shared)

Although LPT should be able to lower its FTE/50 mile metric, it is not advisable to reduce to one staff person without access to backup assistance in case of employee absences, sickness, emergencies etc.. All of the systems we looked at were in the position to borrow personnel. Consequently, any reduction to one full time collections person should be accompanied to access of a backup contract employee, possibly working with the other Townships under a sharing arrangement. Consequently, we do not recommend reducing the collection system staff level as this time unless a provision for backup assistance is arranged.

e) Findings

Overall on a rating of 0 to 5, with 5 being the best, we rate the LPT I/I program at a 4. Moving forward, LPT should continue to identify sources of direct and indirect I/I into the system. The Township has identified priority basins for attacking the I/I and it appears is systematically addressing these basins. The Township should consider a more comprehensive rehabilitation effectiveness program to measure the results. The data reviewed in Appendix B of the Borough's 2013 Municipal Wasteload Management Report dated March 2014, discusses briefly results of some monitoring but in the context of RDII % removal. Additional evaluations of the type of rehabilitation and its effectiveness may be warranted to deliver the highest return on investment.

From our review of the information provided, it appears that CCTV investigations comprise a majority of the investigation work to identify system defects and cross connections in the system. The Township may consider other inspection techniques to further pinpoint the influences of I/I including smoke testing and night flow isolation testing.

The Township has performed considerable rehabilitation of their infrastructure over the previous seven years including:

- Manhole repairs and inserts
- Mainline pipe test and seal
- Lateral repairs
- Cross connection removal

In addition to the I/I recommendations, the Team recommends the Township perform a feasibility study on the Porter Road pump station to evaluate improving operations. With the hydraulic constraints at the Treatment facility compounded by the amount of I/I within the collection system, LPT should consider a wet-well or additional storage capacity prior to the pump station to prevent back-ups at the pump station. LPT's recently approved Act 537 plan estimated that their peak flow is 11,800 GPM; however, they have exceeded this flow and have proposed new connections that have been brought on line.

LPT provided an example invoice from PBA to review, which presents flow and allocation percents and charges pursuant to the Sewer Service Agreement. Appendix T includes a typical invoice and flow tabulation as issued by PBA.

C. Upper Pottsgrove Township

1. Collection and Conveyance Systems

a) System Characteristics:

Most of the wastewater flow Upper Pottsgrove Township (UPT) collected is conveyed directly to Pottstown; a small portion of wastewater is conveyed from UPT to LPT for further conveyance to the Borough's WWTP. The UPT indicated that during 2013 their system experienced an average daily flow of approximately 380,000 GPD, of which only approximately 32,000 GPD was conveyed to the LPT. UPT's collection system consists of 13 miles of sewer pipe ranging from 8 to 18-inch diameter and 427 manholes. In addition, UPT owns and operates two pump stations located within the township; Regal Oaks and Pine Ford Road pumping stations.

b) I/I Program:

From the information provided by the UPT, a Corrective Actions Plan (CAP) has been in place since September 2011 and has focused on reducing I/I into the sewer system. UPT is under a CAP as imposed by the Sewage Treatment Service Agreement. The CAP has been divided into three Phases, I,II, and III

(information on Phase III was not provided to JMT at the time of this evaluation). Phase I, completed in September 2012 primarily focused on a temporary and permanent metering programs, smoke testing, CCTV and localized sewer repairs. Currently, UPT is in Phase III of its CAP. To date, according to UPT, the following I/I reduction tactics have been performed:

- Rehabilitation of manholes to include 6 repairs/replacements and installation of protection pans
- 4 laterals or building sewers have been replaced
- Smoke testing and sump pump inspections
- Sewer televising and temporary flow metering
- Application for grant funding for funding through the Commonwealth Financing Authority to install a Cured-in-place lining on Hanover Street

Based on permanent flow meter data, UPT prioritized their I/I removal efforts. Additional temporary meters were strategically placed within the system to identify areas of the system contributing high levels of I/I. This was done by comparing flow rates in dry weather and wet weather, as well as the number of contributing equivalent dwelling units (EDUs). UPT focused their efforts to known problems areas for I/I including the Regal Oaks development and Sprogels Run Interceptor area. Within the Regal Oaks development, UPT televised specific sewer mains and laterals in the oldest and lowest lying areas. Additionally, crews inspected all manholes and documented observed defects, appropriately.

Field crews also conducted smoke testing in high priority areas based on results of the temporary metering program. During these investigations, crews located a broken cleanout within a natural swale that likely captured direct inflow following wet weather events. Reports indicate that crews replaced the broken cap and calculations showed that for a 2-inch rainfall event, an estimated 42,000 gallons of rainfall was diverted from the sanitary sewer system. UPT has also made repairs to manholes, sewer laterals, and sewer lines that all exhibited I/I defects.

c) Pump Stations:

1. <u>Regal Oaks Pump Station:</u>
   The Regal Oaks pump station is located on Boxwood Court and serves 278 residential homes within the Regal Oaks, Cherry Tree Farms, and Woodbrook Estates subdivisions. The pump station was constructed in 2010 and replaced the failing Regal Oaks treatment facility. The station pumps flows through an 8-inch diameter force main conveying flows to Farmington Avenue, which then flows by gravity to Pottstown. The pump station consists of two non-clog pumps, each with a rated pumping capacity of 373 gpm. There is no metering at the station; however, the flow is measured through a flow meter prior to entering the Pottstown system. The pump station has no upstream screening prior to entering the wet well; at the time of the visit, the operator stated ragging was an issue at the station. The station has a back-up diesel generator for emergency power supply and is exercised on a weekly basis. The station has a jib crane to remove the pumps when routine maintenance is needed, however, the operator feels the crane is undersized and utilizes a tow truck to remove the pumps for routine maintenance.

2. <u>Pine Ford Pump Station:</u>
   The Pine Ford pump station is located along Pine Ford Road and serves the surrounding residential communities. The Township upgraded the pump station in 2011 and the installations of VFD's were put in place on each pump. The pump station consists of two non-clog pumps that flow through a 5" diameter force main conveying flows to the PBA sewer system. Flows are pumped to the Farmington Avenue gravity line, where they combine with flows from the Regal Oaks Pump Station as well as residents along Farmington Avenue. There is no metering at the station; however, the flow is measured through a flow meter located at the municipal boundary with Pottstown. The pump station has no upstream screening prior to entering the wet well; at the time of the visit, the operator stated grease is removed from the station every 4-6 months. The station has a back-up diesel generator for emergency power supply and is exercised on a weekly basis. The station has a jib crane to remove the

pumps when routine maintenance is needed, however, the operator feels the crane is undersized and utilizes a tow truck to remove the pumps.

Overall on a rating of 0 to 5, with 5 being the best, we rate the UPT I/I program at a 3. Moving forward, the Township should proceed with their CAP and continue to reduce the amount of I/I throughout the collection system. Considerations should be made to calibrate the permanent meters more frequently than annually as stipulated in their agreement with the supplier. Data quality is critical to estimating flows and particularly changes in flows through I/I reduction. We recommend that meters be calibrated quarterly as a minimum and also during high and low flow levels to ensure proper functions. If the flow data is being questioned, this would allow for more accurate results and reporting for billing purposes. It is our opinion that the costs ($300 per meter site) are minimal to conduct these calibrations and in turn, would reduce the risk of questionable data being reported in the future. We understand that the PBA has adopted a new system, called Enterprise, whereby flow data is made available online, which increases the access and transparency of flow data in real time, which is a new and good utility practice.

Furthermore, the Township should consider pre and post rehabilitation flow monitoring to determine the effectiveness of the rehabilitation program. Comparing similar storm events before and after the rehabilitation work, or establishing control basins of similar size and demographics would be a way to evaluate the effectiveness of the rehabilitation work. Currently, via the Hach website flow meter data is already observed for UPT at 15 minute intervals where pre and post rehabilitation flow rates can and have been observed.

Both the Regal Oaks and Pine Ford pump stations do not utilize grinder pumps in the pump stations. This is compounded with ragging issues, therefore the Township should consider a prescreening apparatus to aid in reducing the amount of maintenance. At the time of the site visit, the operator mentioned heavy grease problems at the Pine Ford pump station; chemical addition will assist in reducing the amount of grease at the pump station and in turn reduce the amount of maintenance required.

D. West Pottsgrove Township

1. Collection and Conveyance Systems

a) System Characteristics:

West Pottsgrove Township (WPT) collects wastewater WPT and conveys the sewage to the Borough for treatment and disposal. WPT's system consists of 11 miles of sewer pipe serving approximately 1,811 EDUs. The collection system is comprised of 8 to 12-inch diameter pipe and approximately 228 manholes. In addition, WPT operates and maintains two pump stations, Grosstown PS and the Old Reading PS.

b) I/I Program:

JMT reviewed limited information related to WPT's I/I program. The main source of information comes from documentation supplied by WPT to the Borough in their 2013 Wasteload Management Report. According to this report, the following I/I actions have been projected for 2014 by WPT:

- WPT determined that the peak flows incoming to the Grosstown Road PS exceed the pumping capacity of the station. Therefore, WPT will focus on CCTV inspections in the collection system tributary to this pump station.
- Perform repairs as necessary to remove I/I.
- Rehabilitate the sewer lines and manholes on Berks Street and Fairview Street – approximately 2,500 LF of cured in place pipe lining, approximately 280 LF of 8" main replacement (spot repairs), 29 laterals replaced and 12 manholes lined.

In addition, WPT performed sewer main cleaning and treated for roots on 1,468 LF in 2013. The

information above is the only data that was supplied to JMT for WPT's I/I program.

c) **Pump Stations:**

1. Grosstown Pump Station:
   The Grosstown Pump station was rebuilt in 2013 as a result of the existing pump station failing. The pump station serves approximately 95 residential homes and is located adjacent to the Township building. The station consists of two 270 gpm pumps (duty/standby arrangement) with a temporary third pump as a standby, which pump through a 4-inch force main. The flows from this pump station pump to a gravity sewer system within WPT and eventually into the Memorial Park pump station owned and operated by the Borough. The pump station utilizes a propane-fueled engine for back-up operation of one pump. Additionally, the controller for both permanent pumps has a backup battery. In addition, the pump station has a standby bypass pump located outside the facility to handle wet-weather events, which is unusual. When the station was re-designed it did not account for wet-weather flows, therefore the station cannot handle wet-weather events. Pumps within the station are manually turned off and the by-pass pump is turned on for the duration of the event.

2. Old Reading Pump Station:
   The Old Reading Pump station located along Old Reading Pike serves approximately 180 EDU's in the lower portions of WPT. The station consists of two 560 gpm horizontal pumps that pump through an 8-inch force main. The flows from this pump station are not metered and flow into the gravity system within WPT and then into the influent pump station at the treatment plant. The pump station was modified in 1984 and consists of a small building that allows entrance to the dry well. The pump station utilizes a diesel generator for when power is lost to the station. The pumps are controlled by a probe with contact that relay a signal back to each of the pumps for operation.

Overall on a rating of 0 to 5, with 5 being the best, we rate the WPT I/I program at a 2. JMT would recommend that a flow metering program be established to identify the amount of RDII entering the system compared to dry-weather flow. Once the high RDII areas are located through flow monitoring, an SSES program can be established to aid in reducing the amount of I/I in the system. Thereafter, prioritization of sewer infrastructure rehabilitation can occur, allowing the Township to plan funding to assimilate the system. This type of program will create more capacity in the system for the Township and ultimately will reduce the amount of maintenance the system is demanding at this time.

Moving forward, an evaluation of the Grosstown Pump station and the associated 4-inch force main should occur to determine the feasibility of expanding the pump station to accommodate wet-weather events. As the pump station operates now, the Township is incurring high costs from the standby pumps that are required for wet-weather events, as well as the personnel to operate the pumps. In addition, modifications should be made to accommodate for operation during power outages. Currently, the propane-fueled engine is designed and sized for and capable of running one pump during a power outage.

Additionally, metering of the effluent at the Old Reading Pump station would help identify the amount of flow the pump station conveys during dry-weather compared to wet-weather. In addition, the pump control system is dated; therefore, we would recommend either floats and/or a transducer installed to have a back up to the current system. Further, the dry-well is a safety concern due to it being a confined space. An evaluation should be conducted to determine if the minimum amount of air exchanges that are required are being met. At a minimum, a gas meter should be installed to monitor harmful gases.

To summarize, all Townships including the Borough of Pottstown could improve efficiencies and effectiveness in the implementation of their I/I program to reduce the wet weather loading on the treatment facility. An efficient I/I program must have a solid foundation starting with a quality flow monitoring program at most appropriate locations. Not all sites (manholes) offer ideal metering locations. Data quality may be affected by site selection and also lack of appropriate calibrating. Flow monitoring in strategically placed locations will allow the owner to properly identify high RDII locations within the

system. JMT recommends that each municipality adopt a quality management plan for their flow monitoring program that assures quality data.

After an established flow-monitoring program is in place, a SSES program will aid in mitigating I/I in the system. As part of the flow-monitoring program, sub-basins will be delineated and identified through metering and RDII analyses. The next step typically includes performing field inspections, referred to as SSES investigations, to locate system defects that allows RDII into the system. The performance of a comprehensive SSES program includes appropriate selection of one or more of the following techniques:

- Smoke testing
- CCTV inspections, NASSCO[2] PACP-compliant inspections
- Dye testing
- Manhole inspections, NASSCO MACP-compliant inspections

Based on the findings of each municipality's investigation and metering program, decisions are likely made to direct rehabilitation priorities. JMT understands the significant costs associated with open-cut and/or trenchless rehabilitation of sanitary sewers to remove RDII to improve structural integrity of the infrastructure. Typically, rehabilitation projects are directed at the most severe RDII sub-basins. However, many utilities develop hydraulic models of their system to identify capacity constraints or bottlenecks. This, in conjunction with a flow metering program and SSES techniques, would enable PBA (and the townships) to better manage their respective collection systems in a concentrated effort to reduce I/I. Through this analysis, each municipality is better positioned to more effectively direct capital expenses through the identification of higher RDII areas that allow the highest return on investment for I/I removal.

[2] NASSCO – National Association of Sewer Service Companies. This information is utilized by engineers and utility owners to rate, rank, and prioritize repairs to their system to renew system integrity and reduce likelihood of failure.

IV. CONCLUSION AND RECOMMENDATIONS

This effort involved a detailed review of the Authority's treatment plant operations including procedures, business practices, frequency and duration of O&M tasks plus a high level review of technology utilization. In addition, we reviewed the sanitary collection and pump stations located in the Borough as well as the surrounding Townships. This section presents our findings and recommendations with respect to management and finance, the plant as well as the collection systems. A variety of analytical techniques were utilized including benchmarking and best practice comparisons. In summary, Table 25 below presents the rating score card, on a scale of 1 to 5, for each of the various categories from a planning and management, plant unit process (liquid and biosolids units) and collection system standpoint.

Table 25
PBA, Borough and Townships, Rating Sheet Summary

CATEGORY	SCORE
Management and Finance	
1. Planning and Management	**2.4**
a. Strategic Planning	2.0
b. Long Term Financial Planning	3.5
c. Risk Management	2.5
d. Asset Management	2.0
e. Performance Measurement	1.5
f. Customer Involvement	4.0
g. Continuous Improvement	1.0
2. Purchasing Procedures	**4.5**
3. Sewer Service Agreement	**3.5**
4. Budgeting and Financial Procedures	**4.0**
5. Staff Assignments, Compensation and Allocation	**4.0**
6. Emergency Projects	**3.0**
Wastewater Treatment Plant	
1. Liquid Unit Processes	**3.3**
a. Influent Pump House	4.0
b. Mechanical Bar Screen	2.0
c. Pista Grit Removal	2.5
d. Pre-aeration Tanks (Grit Chambers)	3.0
e. Raw Influent Splitter Box	4.0
f. Aeration Tanks	4.0
g. Screw Pumps	2.5
h. Mixed Liquor Splitter Box	4.0
i. Final Clarifiers	3.5
j. Chlorine Contact Tank	3.0
k. Utility Water Supply	5.0
l. Final Effluent Flow Meters	2.0
m. RAS Wet Well Tank	4.0
2. Biosolids Unit Processes	**3.5**
a. Rotary Drum Thickeners	4.0
b. Sludge Thickener Tank	4.0
c. Aerobic Digesters	4.0
d. Centrifuges	2.5
e. Thermal Dryer	3.0
3. Bulk Program	**4.0**
4. Biosolids Disposal Options	**4.0**
5. Efficiency of Plant Operations	**3.0**
6. Maintenance Programs	**2.5**
7. Laboratory Sampling and Analysis	**4.0**
Collection Systems	
1. Pottstown Borough I/I Program	**1.0**
2. Lower Pottsgrove Township I/I Program	**4.0**
3. Upper Pottsgrove Township I/I Program	**3.0**
4. West Pottsgrove Township I/I Program	**2.0**

Notes:
1) Ratings: (1 needs improvement and 5 does not)
2) Ratings 2.0 or lower have been highlighted

Scores are based upon our collective opinion (JMT, M&B operations and Myron Olstein) as a team on how well the utility is doing in certain areas, so the above scores are subjective and may vary depending upon the experience and opinion of the reviewer.

A. Management and Finance

To arrive at our assessment of current operations, we reviewed voluminous documentation and conducted several walk-throughs and interviews. Walkthroughs were performed by personnel experienced in wastewater system management, design and operations. Best practice worksheets were utilized for the recording of observations. Numerous site visits were conducted at both the treatment plant and pump stations. In addition, a series of interviews were conducted to identify practices utilized by the PBA, Borough and the Townships. Multiple interviews were conducted with:

- Authority Manager
- Utilities Director, who also serves as the plant manager of the wastewater and water treatment plants
- Finance Department
- Township Managers (LPT, WPT, UPT)
- Borough Department of Public Works

To assess PBA's management and finance procedures and practices and to ensure that comparisons are as close to "apples to apples" as possible, a number of peer utility groups were formed. Peer groups are groupings of utilities that are similar in one or more attributes for the function of being benchmarked. A summary of the peer groups utilized in this report and some key findings include the following:

1. General benchmarking comparisons

- Wastewater plants of similar size and treatment levels. Multiple peer groups were formed - one group of 12 utilities had an average daily flow (ADF) ranging from 4.1 to 9.7 MGD (the Borough of Pottstown's plant had an ADF of 5.1 MGD in 2012. Although this group had an ADF comparable to Pottstown's, it contained many plants that had a higher level of treatment - advanced secondary and tertiary plants. Out of this group, we formed a separate peer group of 2 utilities with only one secondary plant each with ADFs of 6.1 and 9 MGD, respectively. Two additional peer groups were formed - one of the utilities in touching states and one of the Pennsylvania utilities. The touching state group consisted of three utilities - one utility in Ohio with one secondary plant (2.6 MGD ADF), one New Jersey utility with three advanced secondary plants (9.7 MGD ADF) and one New York utility with one advanced secondary plant (2.5 MGD ADF). A comparison was also performed against five eastern Pennsylvania utilities.
- Wastewater collection systems of similar size. The Borough and Townships manage collection systems ranging from 11 to 72 miles. To compare staffing levels, we identified utilities in the NACWA sample reporting less than 100 miles of collection system. This is a moderate comparison because the NACWA sample appears to consist predominantly of large diameter interceptors.
- Some attributes have a geographic component. For pay comparisons, we utilized the PMAA salary survey data in addition to the national sample from the AWWA Compensation Survey.
- Peer groups did not have to be formed for best practice comparisons, or for metrics which are normalized. The Organizational Best Practices analysis is discussed in more detail in the previous section. For the seven practices reviewed, for PBA, the total score was 16.5. The comparable total median value for Qualserve wastewater utilities was 25 (smaller utilities such as PBA's will generally have scores 2 to 4 points lower). We suggest using some caution in best practice

comparisons since they are self-assessed by the participating utilities; however, our discussion shows that this indicates some room for improvement in both use of technology and management systems.

2. Utility Efficiencies Benchmarking comparisons

Efficiency is determined by cost and staffing metrics. The following is a discussion of cost comparisons: To compare costs against the NACWA sample, which includes 2011 data, we utilized PBA's flows and costs for 2011:

- Compared to 12 utilities with an ADF between 4.1 MGD and 9.7 MGD, PBA's Total Operating Expense/ADF was significantly lower - $765,983 vs. $2,528,674.
- However, these twelve utilities contained 10 that had higher levels of treatment. The two utilities that had only 1 secondary plant (ADF of 6.1 and 9.7 MGD) averaged Total Operating Expense/ADF (TOE/ADF) of $658,652. However, 2011 was an above normal year for PBA's treatment plant expense. Had PBA been at budget, its TOE/ADF would have been $635,383.
- Compared to the 3 touching state utilities that reported operating expense numbers, PBA was lowest in TOE/ADF- $765,983 vs. $ 988,303 to $1,564,437.
- Compared to the 5 Pennsylvania utilities, PBA's TOE/ADF was midway between Wyomissing ($574,803) and Derry Township ($1,509,867). Downingtown is contract operated and may be comparable to PBA if their revenues equal expenses. The spread between the three utilities is actually close - Wyomissing has negligible biosolids costs and Derry's costs include their collection system.
- Compared to both the NACWA and Qualserve data bases, operating cost (operating cost divided by ADF) at the WWTP are below the median of comparable utilities (although most of the NACWA sample contained utilities operating plants at higher treatment levels).
- The cost distribution of the WWTP to NACWA peer groups was presented in the previous section.
- PBA's sewer bills (by EPA criteria) are affordable. The sewer affordability index (average bill divided by median household income) for PBA is 1%. Qualserve median for sewer affordability is 0.63%.

In summary, PBA is competitive on a cost basis.

To compare staffing levels, we compared PBA to the same peer utility groups:

- Compared to the NACWA peer group, PBA has the second lowest total staffing level (total FTE/ADF) at 2.14 FTE/ADF.
- Compared to the NACWA peer group, PBA was well below the average in treatment plant FTE/ADF (1.57 vs. 2.05) beaten out only by the two utilities that have only 1 secondary plant each.
- Compared to touching state utilities, PBA has the lowest ratio of treatment plant staff to ADF.
- Compared to other Pennsylvania utilities, PBA is lowest on both total staff to ADF and treatment plant staff to ADF.

In summary, PBA is competitive on a staffing level.

3. Utility Effectiveness Benchmarking comparison

Plant effectiveness is determined through regulatory compliance and the use of best practices:

- The plant's regulatory compliance (no violations) places it in the Top Quartile of the Qualserve utilities.
- PBA's Best Practice score is 16.5 out of a possible 25. The Best Practice evaluation rates management practices in the following areas: strategic planning, long term financial planning, risk management, performance measurement, asset management, customer involvement and continuous improvement. The median score for wastewater utilities in the 2012 Qualserve survey was 25. The score of 16.5 places the PBA below median, indicative of opportunities for improvement. This identifies programs that PBA could consider implementing to improve performance.
- The overall plant upkeep score is 173 out of a possible 230 (Best Practice score 190.5). The plant upkeep scorecard looks at 23 areas of plant condition. In general, a well maintained plant reflects good management practices. The scoring details identify areas with a potential for improvement. With the exception of security, by not having a gate card reader, PBA scored well on plant upkeep.

4. Maintenance Programs

The plant staff spends a lot of time on preventive maintenance activities, which are primarily manually driven based upon experience of the Utilities Director and manufacturers' recommendations. The plant is highly engaged in maintenance activities and the plant is well maintained. However, a relatively low level of "predictive" maintenance is in effect. The median planned maintenance percentage for wastewater utilities in the 2013 Qualserve survey was 83%. Further, the plant appears to have an above median level of "reactive" maintenance. This is primarily due to the lack of an automated maintenance management system, limited staff and issues relative to the dryer. This is not a poor reflection on plant staff in any way, yet presents an opportunity for future improvement.

Maintenance procedures are currently "paper based" and could be more predictive moving forward, which is one advantage of implementing a new asset management system.

5. Personnel

- PBA averages 80 hours of training per full time employee per year placing it well within the Top Quartile of wastewater utilities. This is substantially above the Best Practice target of 40 hours and well above the Qualserve top quartile base amount of 67 hours indicating training as a high priority.
- Although Qualserve no longer reports a Health and Safety Index, we believe that PBA would not score well based on a review of workmen's compensation cases and sick leave statistics. Factors include a high average worker age (58) and an approach to plant work that involves a great deal of physical effort. Approximately 15 hours per year of safety training are provided by the utility.
- Salary comparisons were performed using the 2013 American Water Works Association Water Utility Compensation Survey - Small and Medium Sized Utilities (Utilities with a served population less than 100,000), Eighteenth Annual Report (AWWA, Denver, August 2013) and the Pennsylvania Municipal Authorities Association (PMAA) all regions survey for organizations with 16 or more employees. This is a comparison and not a salary assessment. The job duties for PBA employees may not be identical to those in the survey.
- In terms of personnel; at a present staff count of 14 full time equivalents (FTEs), who are assigned to the plant (plus the water treatment plant that is outside this scope), PBA is at or below local and national staff levels.

- With regards to staff compensation and for comparison purposes only: PBA operators fall within the range of plant personnel salary levels in the industry on a local level; therefore, those ranges are acceptable. However, some utility management salary ranges tend to be at or below average local levels per the PMAA salary report, plus at national levels per the AWWA salary reports.

6. Financial

- Procurement and purchasing procedures are acceptable and sufficient and by all accounts, are being followed by PBA. Auditors have never commented negatively on Procurement procedures and a high level check on expenses indicates no problems.
- Budgeting procedures are sufficient; however, they can be refined in order to decrease the gap between budgeted costs and actual costs, such that actual costs come within 10% of budgeted costs. PBA has developed a contingency fund to account for unforeseen or emergency events and expenses, which is a good business practice.
- Despite a stagnant growth rate (2.4% from 2000-2010), PBA maintains a good cash position and should have no problem meeting its current debt service obligations.
- JMT collected some local sewer rate data; however, did not perform a rate study and no decision has been made with regards to raising rates in 2015 and beyond. Rates were increased in 2014.

7. Management and Finance Recommendations

- Implement an electronic operations and maintenance management system. Examples include: IREG, etc. Evaluate a new software program to manage operation and maintenance protocol for each unit process at the plant, including an inventory of spare parts.
- PBA should continue to receive outside solids (both septage and outside waste) to sustain or raise revenue. Increasing the rates that PBA charges to outside customers, since their rates are relatively low, will further increase revenue over time. We recommend a phased approach whereby PBA marginally raises septage and outside solids rates over time.
- Evaluate and rebid the polymer used at the plant relative to dewatering facilities (thickeners and centrifuges) since this is a high cost item.
- Differentiate between, track and define "non-utility" work or "donated time" including; but not limited to: snow plowing, maintenance of dog kennel at the plant, etc. For budgetary purposes Townships should not be charged for non-utility time.
- Semantically, we would recommend changing the words "sewage" to "wastewater" and the word "sludge" to "biosolids" in all reports and correspondence moving forward.
- Average age of plant staff is 58; therefore, a succession plan should be prepared. Depending on the speed with which automated management systems are implemented, a knowledge management program could also be considered, where staff members "download" facility knowledge to a database describing their duties, experiences, challenges, resources, lessons learned and recommendations for future improvement.

B. Wastewater Treatment Plant

Details of plant operations have been discussed in section II. B. in the report. Generally, the plant does well from a regulatory compliance standpoint during normal/dry flow conditions. It scores well from an upkeep standpoint, except for security and some safety considerations. As a result of the study, JMT summarizes our assessment of current operations and our findings are described as follows:

1. Assessment of Current Plant Operations and Findings

- As far as the existing wastewater treatment plant is concerned, the plant is generally well

managed, operated and maintained with current staff, management and business practices.

- With respect to the condition of the plant, which was originally built in 1931 and last upgraded in 1991, with subsequent improvements made since then, including the installation of a thermal dryer in 2005 to produce Class A biosolids, the plant is sufficient to handle average daily flow. The plant is generally in compliance with its NPDES permit and secondly, according to the 2013 Chapter 94 report, the plant is not considered to be hydraulically overloaded based upon monthly flow data. However, while the plant is currently rated at 15.6 MGD, the plant does see a dramatic increase in flow during a heavy rain event resulting in very high peaking factors. Comparing average to peak flow, for example, during a normal dry day, average flows are approximately 5 MGD. In April 2014, during a heavy rain event, flows were estimated at over 50 MGD. Realize this is an approximate peak flow only since the flow meter cannot accurately record flow in excess of 32 MGD. Further, liquid processing is limited primarily because there is no upfront equalization at the head of the plant to stabilize the flow prior to the aeration tanks, nor is there primary clarification, typical at other plants this size.
- With respect to solids processing, in 2005, PBA invested significant capital ($6.6 million) at the plant as a result of the sludge dewatering and drying project, which included new centrifuges and a new dryer, to produce a high quality Class A product. Despite operational problems related to the dryer, when functioning, this system generally works well to produce a Class A material, which, on a unit cost disposal basis, costs less to dispose of as compared to producing Class B material without the dryer.
- The overall plant is generally efficient. Most large motors have VFD drives or have been replaced with VFDs, which improve efficiencies to save electricity, except for the aeration blowers, which are slated to be replaced with new VFDS and blowers in 2016. JMT did not perform an electrical audit of the plant.
- One challenge is that there is no emergency generator at the plant, so PBA relies on 2 power feeds from PECO, which has only recently been determined to be unreliable due to a recent power outage.
- The major future capital line item is the installation of a new final clarifier. Per the capital improvement plan (CIP), a third final clarifier is proposed at the end of the plant. This project has been put on hold pending further evaluation due to the cost ($2.0 million) and need.

2. Plant Recommendations

- Prepare cost/benefit analysis on installing two (2) new emergency generators for backup power. Currently, 2 PECO power lines provide power to the plant, but have recently been proven to be unreliable. Many plants in PA have back up power via onsite emergency generators. The "root cause" of the recent outage should be identified by PECO.
- In the short term, PBA should contact and become a member of the PA Water Agency Response Network (PAWARN) a service that provides auxiliary services at a nominal charge.
- Upgrade SCADA system throughout the plant (currently the plant is ½ SCADA) to increase levels of automation as well as to increase monitoring and control. It is our understanding that a new full scale SCADA system is being planned for 2017.
- Due to risk management and safety issues, perform cost/benefit analysis to install new Ultraviolet light (UV) disinfection or liquid chlorine disinfection system to replace the gaseous chlorine system, particularly in light of the new residential development located 1 mile down the street from the plant. Onsite generation of liquid chlorine (Miox®) can also be considered.
- Improve and refine the High Water Service plan and evaluate alternate solutions to deal with the high water level or high storm events, other than the installation of a third clarifier, such as high rate ballasted flocculation or the Comag® process, etc. at the head of the plant. A cost/benefit analysis should be prepared for the third clarifier while considering other alternatives. It is our understanding that PBA is installing a new effluent flow meter to accurately record high flow rain events while reviewing alternate treatment options.

- Replace the 4 aeration tank blowers (existing centrifugal blowers, constant speed) with positive displacement blowers with VFDs to improve efficiencies. It is our understanding that this project will be executed by 2016.
- Keep the dryer on-line and in production to continue to produce Class A biosolids. Additional revenues can be generated if PBA can identify customers (farmers or landscapers), who would pay for Class A material or dispose of it at no additional cost to PBA. In addition, seasonal operation of the dryer could be considered to extend the useful life of the dryer.
- Join the Mid-Atlantic Biosolids Association (MABA) to network with other utilities, who have dryers to optimize biosolids processing at the plant and to network with other operators.
- Adopt the NFPA (National Fire Protection Association) chemical labeling system for all chemicals used throughout the plant and at the pump stations for safety and informational purposes.
- Conduct a vulnerability assessment and install a security fence around the plant with gate card reader. It is our understanding that this project will be implemented by 2016.
- The screw pumps are maintenance intensive and consideration should be given to replacing them with submersible pumps, only as each screw pump goes down for maintenance (due to bearings, shafts, motors, etc.) "Shearing of the floc" should be considered, although having a single or double vane impeller plus slowing down the pump speed may address this potential issue.
- In the short run, repair and reinstate the "Pista-grit" system, so as to prevent having to manually remove the grit from the aerated grit tanks. If this is not effective, then consider other permanent and mechanical grit removal options.

C. Collection and Conveyance Systems

Our recommendations with respect to the Borough and Townships owned collection systems are indicated as follows:

1. Collection and Pump Station Recommendations

- PBA meets with the Townships on a monthly basis and we believe the level of communication is sufficient. However, getting the financial data to the Townships as soon as possible will help them better manage their respective budgets.
- While the PBA is the permittee of the NPDES permit at the plant, and therefore, is the party most responsible for compliance with the PaDEP and to some extent, EPA, the Townships, as wholesale customers, should have a mechanism for providing input to PBA, which they currently do through the vehicle of monthly meetings.
- Boroughs and Townships should increase and accelerate their activity with respect to reducing I/I, which are among the highest levels in the state. Corrective Action Plans (CAPs) are in place for Upper Pottsgrove and Lower Pottsgrove Townships, and they should make additional physical improvements to their respective systems, to not just meter flow and televise sewers, but to rehabilitate their system in a strategic and accelerated way to reduce I/I into the collection system (manholes, sewers and laterals). This will thereby reduce flow to the PBA plant. Laterals need to be part of the solution too since they contribute significantly to I/I. Appendix U provides a discussion on private sewer laterals that speaks to this issue.
- Meter data should be accurate and made available online for consistency and transparency among the stakeholders. This can be incorporated into the new Enterprise® flow metering program that just went online during the time of this study.
- The nature of the Sewer Agreement is common in the industry and sufficient in terms of content and spirit; however, should be amended to allow for revised allocated capacity from the Borough and for each Township. The penalties are comparatively high if their allocated capacities are exceeded (which happened to Upper Pottsgrove TWP in 2013); however, given the severity at the plant due to significant I/I, they are somewhat warranted to provide additional incentive to the Borough and Township to lower I/I.

- The last update to the Sewer Agreement was 2002, so it should be revisited and amended accordingly. Penalties could be considered to be reduced if the Townships provide assurances to PBA that I/I will be reduced.
- Muffin Monsters® or comminutors should be installed or retrofitted at each pump station to remove debris from the station so as to protect the pumps as the first line of defense.
- Borough's Inflow and Infiltration (I/I) program is reactive rather than proactive. We recommend that the Borough implements a more thorough, cohesive and functional I/I program. At a minimum, the program should include the following elements:
    - Flow monitoring program - aimed in strategic locations to aid the Borough in understanding the impacts to the sewer system during wet weather events. It should also assist in quantifying the amount of flow from each contributing municipality to better document the quantity of receiving flow.
    - Sanitary Sewer Evaluation Survey (SSES) – A SSES program will help the Borough in prioritizing which areas within the system I/I can be successfully removed. A typical SSES program would consist of either; smoke testing, CCTV inspections, manhole inspections, or dye water testing or a combination thereof.
- SSES programs can range in cost and time depending on the scope of the project; however, an effective flow-monitoring program will dictate where the SSES program is most effective.
- The municipalities should consider contracting mechanisms for SSES field work that allows for an economy of scale savings by choosing one or two contractors to perform larger amounts of work, even if the work is performed across municipal boundaries. By increasing the scale and scope of the work, the municipality is more likely to realize cost savings.

Appendices

Appendix A

Scope of Work Outline

Pottstown Borough Authority

A. Efficiency of Plant Operation

1) To include a comparison with other similar- sized facilities to find any categories that may be outside "normal" parameters

a. Conduct an in-depth analysis of any such categories

(1) Determine causal factors for abnormal costs (too high or low) and provide cost recommendations

B. Maintenance programs, including record keeping, compliance with manufacturer's recommendations, staff assignments and maintenance budget

1) Conduct an in-depth analysis of maintenance practices through benchmarking with like facilities

a. Review work flow management methodologies (i.e., preventative and corrective maintenance tasks, predictive maintenance, etc.)

(1) Identify "high maintenance" items/equipment and provide recommendations regarding cost savings alternatives where appropriate

b. Develop recommendations for preventive maintenance (PM) and predictive maintenance (PDM) in regards to major items of equipment and/or systems

(1) If appropriate, determine if outsourcing specific maintenance responsibilities is a viable and cost saving alternatives

C. Project Planning and Management

1) Conduct an in-depth analysis of all operational tasks

a. Determine if additional automation or multi-tasking would provide cost savings

b. Determine if there is any duplication of work efforts by support staff, or if there is any work being performed that does not add value to the plant and provide recommendations if issues are noted

D. History of emergency projects and determination as to what may be considered an emergency vs. compliance with maintenance program

E. Purchasing procedures and controls

F. Development of Budgets and Procedures for tracking expenditures

G. Financials Procedures

1) Examine past years (minimum of three)

a. Determine costs and revenues for all major categories; labor, overhead, administration, chemicals, energy, sludge disposal, bulk sewage/septage collection, and supplies

(1) Calculate on a per unit basis (e.g. MGD)

2) Review allocation of costs/revenues among member municipalities per the sewer service agreements

3) Review and identify possible revenue opportunities
4) Review institutional arrangements and identify alternatives to same

H. Imported Sludge Program
1) Economics of the program
2) Impact on the plant infrastructure
3) Staffing
4) Control on sludge being imported (quantity and quality)

I. Imported Septage Program
1) Economics of the program
2) Impact on the plant infrastructure
3) Staffing
4) Control on septage being imported (quantity and quality)
5) Billing rate structure

J. Sludge Disposal Options
1) Review the economics of operating the dryer to produce Class A Sludge along with the associated personnel costs, chemical costs, disposal costs and utility costs.
2) Review the economics of dewatering the sludge along with the associated personnel costs, chemical costs, disposal costs and utility costs.
3) Provide a recommendation as to which sludge disposal option is economically in the best interest of the Authority.

K. Staff assignments and allocation of personnel.

Townships and Boroughs

A. Maintenance program for collection system and pump stations
1) Identify common transportation facilities and review cost sharing arrangements

B. Review of Municipal programs for addressing infiltration and inflow within their collection system

C. Development of budgets and procedures for tracking purposes

Appendix B

February 7, 2014

Mr. Mark Flanders, Authority Manager
Pottstown Borough Authority (PBA)
Pottstown Borough Hall
100 East High Street
Pottstown, PA 19464

RE: Comprehensive Review of Sanitary Sewer System;
Information and documentation request,
Pottstown Borough Authority, Montgomery County, PA

Dear Mr. Flanders:

We are in receipt of the Notice to Proceed (NTP) in connection with the above referenced study. JMT and its teaming partners look forward to working with you and the contributing municipalities on this study. As a first step and discussed with Thomas Weld, PE, please find below our information and documentation request, listed and organized in terms of order of priority as well as category function (General, Operations and Maintenance (O&M), Staff and Financial) needed as part of the study. This will facilitate the kickoff meeting, which will be scheduled in approximately 2 weeks. Some of the information below was included in our December 3, 2013 Proposal, on page 23. Items are indicated in the table below:

Item #	Function	Description	Priority*
1	General	Plant design memorandum or design engineer's report for the last upgrade and relative to the Dryer project	2
2		2012 Chapter 94 Report and 2013 Chapter 94 Report (when it is submitted to PaDEP by March 31, 2014)	1
3		Biosolids receiving, handling, dewatering, and disposal plan (including staffing, septage receiving rates, disposal costs, list of names or types of customers)	2
4		WWTF: as-builts (mainly civil and mechanical plans and sections) equipment list and spare parts list	2
5		Pump Stations: as-builts (mainly civil and mechanical plans and sections) equipment list and spare parts list	2
6		Latest Act 537 Plan prepared on behalf of the PBA. We assume all sanitary lines are separate, not combined – Please confirm?	3
7		For each organization, identify: recent average daily flow, reuse/reclaimed water (if any) and private sector services that are outsourced.	1

Item #	Function	Description	Priority*
8	General	Latest NPDES permit and PaDEP correspondence related to wastewater treatment plant	1
9		Capital Improvement Program (CIP) from Townships and Borough	2
10		Corrective Action Plans (CAPs) from Townships and Borough	2
11		I&I mitigation plans from Townships and Borough (if separate from or in addition to the CAP)	2
12	O&M	Notice of Violations (NOVs) relative to the Authority, Borough and/or Townships	1
13		All active Consent Decrees from all the municipalities	1
14		Preventive maintenance plans, practices, schedules, etc.	2
15		Planned Maintenance versus reactive maintenance (staff, hours, overtime, etc..)	3
16		Plant failures: due to power outage, shutdown – how many times have the final clarifiers overflowed? (excluding construction)	2
17		Pump Station failures: due to power outage or other reason	2
18		Collection system failures: loss of capacity due to restrictions caused by blockages or line breaks	2
19		Number of CSOs/SSOs and events (if applicable)	2
20		Twelve (12) months of Discharge Monitoring Reports (DMRS) indicating effluent concentrations: BOD, TSS, etc. Also, tabulate influent concentrations/loadings to the plant, twelve (12) months.	1
21	Staffing	Job Titles and Descriptions (Authority, Borough and Townships) with an allocation of personnel to each category: admin, collections, treatment, industrial pretreatment, biosolids	2
22		Staffing organizational charts (Authority, Borough and Townships)	1
23		Work schedule of all employees including shifts, weekends and emergency calls	1
24		Any personnel metrics recorded: training hours, days away from work, total hours worked in one year, % of employees within 5 years of retirement eligibility (age or years of service), % of employees within 10 years of retirement eligibility	3
25		Review/Access to Operation and Maintenance Manuals (plant and pump stations)	3
26		Review/Access to Standard Operating Procedures (SOPs); Plant and Pump Stations	3
27	Financial	Five (5) years worth of financial documentation including income statement, balance sheets, cash flow statements, capital and operating budgets and reports	1
28		Latest Bond study or official bond statement along with debt service calculations	1
29		For each organization, an allocation of operating costs to the following categories: total operation expenses, admin expenses, collection system, industrial pretreatment and biosolids	2

Item #	Function	Description	Priority*
30	Financial	For each organization, an allocation of operating costs to the following categories: wages and salaries, benefits, chemicals, electric power, other utilities (gas, communications) supplies and materials	2
31		For each organization, population served: wholesale and retail accounts along with service area (square miles).	2
32		Most recent Sewage Treatment Service Agreement	1

Priority*:
1 – requested prior to kickoff meeting (2 weeks)
2 – requested as soon as possible close to the commencement of the study (1 month)
3 – requested soon thereafter to assist with preparation of the study (2 months)

Also as requested, JMT standard terms and conditions and the insurance certificate will follow under separate cover. If you have any questions, please do not hesitate to contact me directly at 215.496.4727 (office) or 610.731.5444 (cell) or by email at smarcino@jmt.com. Thank you.

Sincerely,

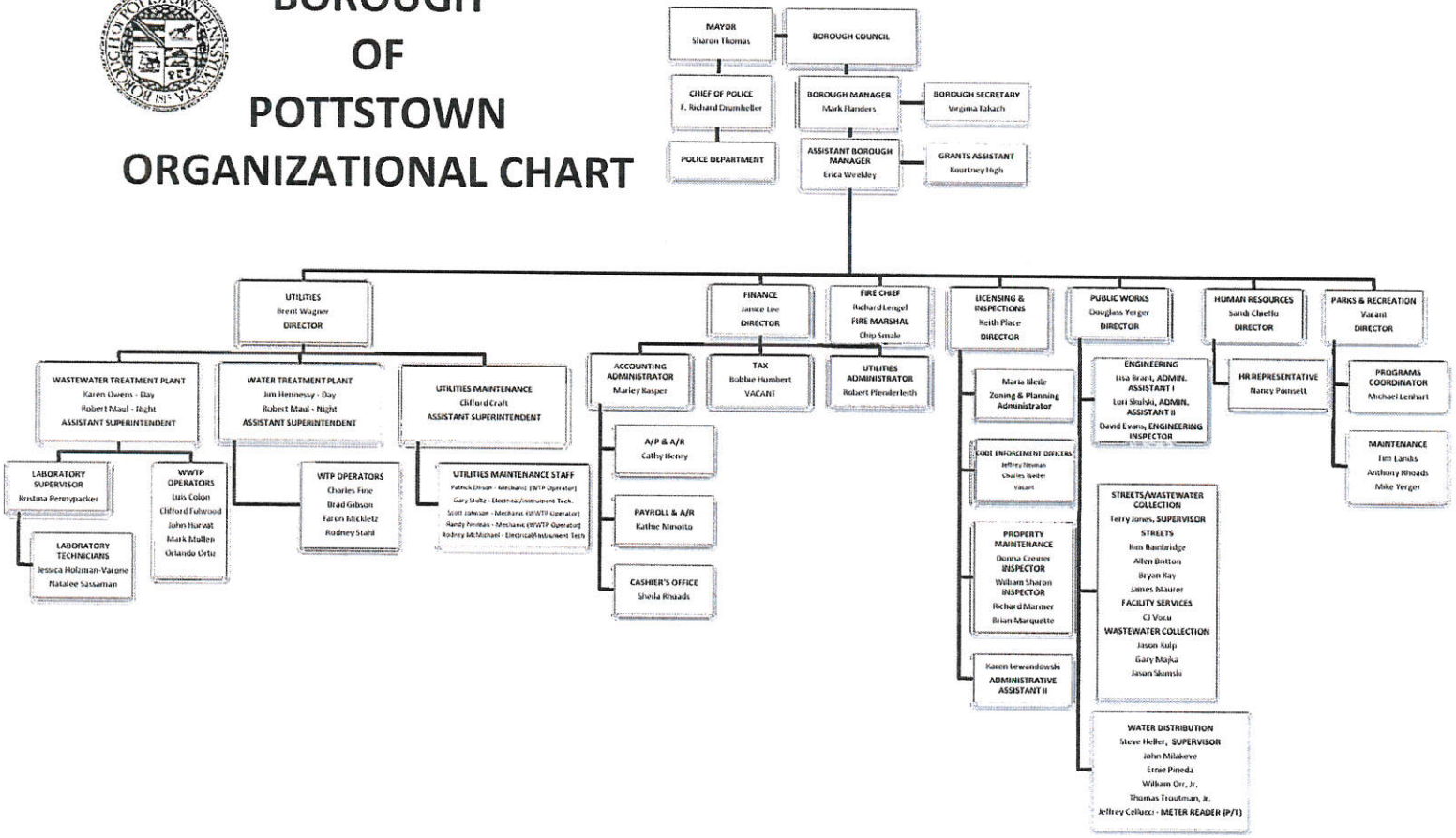
Stephen A. Marcino, P.E.
Project Manager

SAM

Cc:
Thomas Weld, PE – BCM

Appendix C

BOROUGH OF POTTSTOWN ORGANIZATIONAL CHART



01/06/2014

Appendix D

Quick Overview
Plant Operations

The plant operates 24 hours a day 365 days of the year.

Operations: Total of Six Operators – three shifts per day; third – 11pm to 7am; first 7am to 3pm; and second 3pm to 11pm
There are a total of six operators that man the plant all the time. Two operators for first shift, two for second, and two for third. Four days of the week there is only one operator on duty and when the operator is off on leave as well. The operator is responsible for the entire plant at all times. When all operators are off on leave, maintenance or management operators the plant based upon what duties are being performed.

Maintenance staff: Two mechanics and one electrician
The maintenance staff works Monday through Friday 7am to 3pm.
The maintenance staff performs all repairs and preventative maintenance on plant equipment including 3 pump stations. They fill in operations and any other duties when needed. They also assist with maintenance at the water plant and public works department.

Laboratory staff: Two laboratory technicians and one laboratory supervisor

The laboratory operates first shift everyday of the week. The laboratory technicians work by themselves four days a week. The laboratory supervisor oversee the laboratory and including the water treatment plant as well. The staff also implements the FOG program. The staff will operate the plant and help with maintenance as well.

Assistant Superintendent/Muncipal Industrial Pretreatment Program Adminstistrator/Bulk Administrator

Second and third shift manager: Works both the water and wastewater plant to oversee operations. Works operations, performs maintenance, and other related duties

The assistant works Monday through Friday 7am to 3pm. She is on call all the time(second call). She will take the calls when the director does not. The assistant performs all duties related to operations, administrative duties, MIPP, FOG, and bulk program. She will operate the plant and perform laboratory duties when needed.

The director works Monday through Friday 7am to 3pm. The Director is on call all the time and is the first call. The director is for both the water and wastewater plants. The director performs administrative duties, maintenance duties, operates the plant, and oversees all aspects of both the water and wastewater plant.

All staff are on call and will respond to emergencies.

Preventative Maintenace verse reactive maintenance
The plant maintenance program operates on preventative maintenance plan the ensures all equipment is operating at all times. All equipment is evaluated by internal staff and external manufactures of equipment.

Example: Centrifuges are taken out of service every year March through May; total overhall of units are done to ensure that they operate continuously. Weekly greasing is performed and oil changes based upon hours of operations.

Conveyors are check by internal staff daily and once per year an external vendor overview. All conveyors are greased weekly, oil changed in gear boxes once per year, and rebuild of auger and troughs based upon wear. E

Energy Savings

Digesters: Plant staff changed diffusers to fine bubble themselves; better oxygen transfer; reduced from operating two 250 hp blowers to one 250 hp blower. Installed new blower system; old system had four 250 hp blowers; new system had three 250 hp blowers using VFDs. Reduce electric by 15 percent or approximately $7000 per month

Dryer: Installed cap bank on drive motor. Two areas that are being evaluated for further energy savings: the sludge coming out of dryer – take recirculate water through conveyor to preheat sludge; heat exchanger on smoke stack from boiler to preheat sludge – this would help save natural gas cost and increase capacity of dryer. Reduced electric 1 percent – or $500 per month

Current evaluating energy recovery systems: heat exchanger on flue and cooling conveyor.

Centrifugal blowers: Capacitors on each blower; reduce number in operations based upon demand of system – a timer placed on blowers to cycle on and off. Reduced electric by 4 percent or $2000 per month and chemical demand for pH and alkalinity control; $3000 savings a month. Performed evaluation with Hoffman blowers to install VFDs and it would not be feasible unless blowers are changed to PD.

Utility water system: installed new utility water pumps with VFDs. Went from 60 hp to 40 hp. Reduced electric by 1 percent or $500 per month

LED lights throughout plant have been installed. Reduced electric by less than 1 percent or less than $500

Aeration tanks: Plant staff installed new diffuser system in old aeration tanks themselves – this has assisted plant with better treatment and reduction of blowers being used, staff saved well over $300,000 on installation by doing this themselves and made a retrofitting part.

Thickener: Plant staff installed VFDs on all equipment.

Motors replaced when applicable with premium efficient motors.

Cleaning motors and filters often.

Energy bidding: bid out electric and natural gas; our costs have gone down the last 5 years by 15 percent in generation charges. With the bidding and all the energy reductions techniques we are paying less for energy than we did 20 years ago.

Overtime Evaluation

2011 Started year two operators down, took 10 months to get two employees; this was entirely too long and caused operations overtime, some large amount of overtime was from Hurricane Irene and Tropical Storm Lee.

2012 Full staff until second part of the year, down one lab tech and two operators for last six months, this caused an increase in overtime; some large overtime events was due to Hurricane Sandy.

2013 Short one operator through April, an employee was hired internally and public works would not release employee until they got an employee; we also went down another operator for a few months due to an employee out on medical leave

All shifts must be filled at all times; operations staff, maintenance staff, and management works all different shifts to ensure plant operates. With taking months to almost up to a year to fill positions then training after someone is hired for upto 6 months; this causes almost all the overtime unless an operator is on vacation. With taking so long to hire the morally of the operations was compromised and the crew became very upset with management not moving on filling the position. The reason for the extended period of time in not hiring anyone comes from Human Resources taking months to even post a job.

DATE	OVERTIME	STAFF LEVEL
Column1	Column2	Column3
11-Jan	147	12
11-Feb	85.5	12
11-Mar	123	12
11-Apr	101	12
11-May	173.75	12
11-Jun	160.5	13
11-Jul	89.75	13
11-Aug	162	14
11-Sep	99.25	14
11-Oct	24	14
11-Nov	42.5	14
11-Dec	72.5	14
12-Jan	30.5	14
12-Feb	25.25	14
12-Mar	103.75	14
12-Apr	72	14
12-May	72.75	14
12-Jun	44.5	14
12-Jul	20.5	14
12-Aug	40	13
12-Sep	47	12
12-Oct	152	12
12-Nov	157	12
12-Dec	136	13
13-Jan	73	12
13-Feb	126	12
13-Mar	83	12

13-Apr	90.25	14
13-May	74.5	14
13-Jun	73.5	14
13-Jul	80	14
13-Aug	32.5	14
13-Sep	59.5	14
13-Oct	20	14
13-Nov	13.75	14
13-Dec	78.25	14
14-Jan	83.5	14
14-Feb	83.75	14
14-Mar	36	14

Staff Shortage

When plant is operating with full staff; we have 6 operators, 2 maintenance mechanics, 1 eletrician, 0.5 director, 1 assistant superintendent/mipp/bulk, 2 lab techs, 1 lab supervisor, 0.5 shift supervisor – total employees is 14.

From 2011 through 2014 on average we have averaged 12.5 employees, with at most two operators down for 10 months.

Pottstown
Priority 2 / Item 10

Corrective Action Plan

Bulk Hauler Spills

The haulers continue to present us with spills in which we are now into a Consent Order to mitigate this problem. Originally DEP just fined us and staff recommended we go into a Consent Order to improve our operations.

The Corrective Actin Plan is as follows:

1.) Provide spill containment on all locations to prevent spills entering storm drains. This is complete at of December 2013
2.) Increase road with of back driveway. This is complete at of December 2013
3.) Apply for a permit to DEP by April 1, 2014 for construction of larger tanks for the bulk. This is on schedule.
4.) Continue to provide haulers on our rules when discharging
5.) Inspect haulers when discharge to ensure they are following our rules; using a ticket if hauler is found to violating our rules

Date & Time: _____

Driver/ Truck License Plate #: _____

Hauling Company: _____

Disposal Location: _____

Plant Personnel: _____

A driver from your company, noted above, was not with their truck valve or caused a spill/ overflow while they were unloading their truck at the Pottstown Wastewater Treatment Plant. The driver must stay at the truck valve at all times. It is the driver's responsibility to ensure there is no spill from their truck or over flow at the unloading station.

Action Taken: _____ Initials: _____

Plant Operational Issue

On Friday April 4th, experience a steam leak on dryer.

This then caused us from producing a Class A biosolid to a Class B biosolid. In order to do this operational staff had to shutdown dryer and hauling company changes were needed.

The following is a list of phone calls made by cell on Friday(Director performed this):
3:07pm Hauling company
5:04pm Hauling company
5:08pm plant staff
5:11pm plant staff
5:23pm plant staff
6:28pm plant staff
6:45pm plant staff
8:45pm plant staff
10:05pm plant staff
10:52pm plant staff

I was at a Reading Royals game in which my son was a part of due to his team winning a championship and the Royals presented the team an award. During the whole game as you can see I had to communicate to staff in order to make the necessary changes on operations.

Outside the normal onsite Management of Operations

The Director takes all emergency calls and calls into all shifts unless on vacation, and even on vacation I still take phone calls. Normally second shift is called everyday and on weekends first shift is called everyday to go over operations. Third shift I sometime make call at their start of their shift or the end of the shift.

Director call into staff when on cell to minimize time to get a hold of if there is a plant need.

The following depicts a normal high flow event and the amount of calls made by or received by the Director, these calls are made to ensure plant operational needs are met; director makes all decisions to ensure plant is incompliance:

On March 29th, 2014 a high flow event began:
Director received a phone call on home phone at 10:15am– first shift
Director received a phone call on home phone at 10:20am– first shift
Director received a phone call on home phone at 10:22am– first shift
Director received a phone call on home phone at 10:45am– first shift
Director received a phone call on cell at 12:44pm – first shift

On March 30th, 2014 high flow event continued:
Director received a phone call on home phone at 12:44am-third shift
Director received a phone call on cell at 1:18pm – first shift
Director received a phone call on cell at 2:11pm – first shift
Director received a phone call on home phone at 5:49 pm – second shift
Director received a phone call on home phone at 5:57 pm – second shift
Director received a phone call on home phone at 8:20pm – second shift
Director received a phone call on home phone at 10:31pm – second shift

The above calls are normal when there is any high flow event going on or when there is an operational issue going on. As you can see there is a lot of communication and interruption of the household.

OPERATIONS LOG DATA EXTRACTION
For Period 7-20-10 Through 4-2-14

Extracted data indicating:

- Number of and nature of calls to management for assistance.
- Overtime total hours for emergencies.
- Overtime total hours for non-emergencies scheduled and unscheduled.

Calls to Management:

1. Emergency for Critical Failure, Cl_2 Issue, Operations, etc. 10
2. High Flow reporting.....17
3. Personnel Issues, Relief Issues 7
4. Equipment Status notification, Mechanical Failure, etc. 50
5. Odor Complaint Reporting 4

Overtime for Emergencies:*

- Cl_2, critical failures, Spill Response, etc. .....19 hrs.

Overtime for Non-Emergencies:*

1. Relief Issues (Late or No-Show)..... 30 hrs.
2. Operator Called Out (unscheduled) ..... 82 hrs.
3. Scheduled Overtime (Approved Absences, High Flows, Training .....542 hrs.
4. Scheduled Overtime for Hurricane .....32 hrs.
5. Snow Removal ..... 71.5 hrs.
6. Stay or Early to Assist Lone Operator[1] ..... 20.5 hrs.

NOTES:

- Scheduled overtime is difficult to determine other than circumstantially as it is not indicated on log as such.
- Calls indicated, but not specifically noted as outgoing, are assumed to be incoming from Brent to check plant status.
- Some logged outgoing calls to Brent are routine (ex.: DEP notifications), and some are due to new employees in training.

* As reflected in Operators' Log, not from Payroll records.

[1] Pumping Station calls, or emerging issues (spills clean-up, etc.).

mm/BW

Pottstown
Priority 3/Item 15

Preventative Maintenance Plan, practices, schedules

Planned maintenance versus reactive maintenance

Our philosophy of maintenance:
The plant staff takes every step to prevent reactive maintenance problems from occurring.

During the last few years, we have had one major reactive maintenance issue in which we had no control of the situation. The stainless steel failed on the dryer, and since the system was undersized; and these two factors attributed to a complete failure of the dryer system for well over a three year period; this caused an extreme problem with the maintenance and sludge hauling costs. Plant staff took it upon themselves to get the system in place that would reduce the wear on the paddles – the manufacture only wanted to hard face a portion of the system, staff determined that the entire system to be hard face. However, this does not stop the fact the system is too small for our operations during the year. The dryer and centrifuges from initial design process were too small and overloaded – engineer specified 118 gpm plant staff specified 150 gpm on average. This can be further discussed during plant visit.

If there is not a spare in the plant design, plant staff maintains an inventory for those pieces of equipment if a failure occurs. Example: spare digester transfer pump – kept onsite since there is no backup pump.

Each piece of equipment is evaluated by plant staff. Every piece of equipment is maintained either by having an oil change, greasing, or rebuilding the unit based upon wears. Examples: centrifuges are rebuilt every year, greased weekly, and oil change on gearbox on hours of use. PD Blowers SCADA keeps track of time and gives an alarm for when oil change is necessary – oil is evaluate by lab to determine the quality as well. Thickeners are greased monthly, drums totally rebuilt a few years ago, and thickener totally rebuilt in 2013 with new catwalk installed.

To completely evaluate our maintenance program, it is recommended to visit the plant to discuss operations and maintenance directly with staff.

Predictive, Preventative, Reactive, Upgrade Maintenance and Emergency Maintenance and Projects

Definitions:
Predictive Maintenance: techniques are designed to help determine the condition of in-service equipment in order to predict when maintenance should be performed; monitoring said machine with infrared or vibration technology etc. To find repairs that need to be addressed as preventive maintenance. Before they become an emergency situation – proactive approach

Examples of predictive maintenance:
Conveyors are checked every year by an outside maintenance company to determine which conveyors will need preventative maintenance before they fail.

Clarifiers drive system is removed every 9 to 10 years to have preventative maintenance performed on them.

Lower Pump House pumps are removed and preventative maintenance is performed on them.

Preventative Maintenance: The care and servicing by personnel for the purpose of maintaining equipment and facilities in satisfactory operating condition by providing for systematic inspection, detection, and correction of incipient failures either before they occur or before they develop into major defects; Is scheduled "down time" for said machine to replace wear parts or repair the machine at a convenient time before it becomes an emergency.
- Proactive approach

Conveyor metal parts are painted every 7 years or so.

Changing oil on a schedule basis upon hours operations and/or oil failure.

Grease bearings on a schedule of hours.

Rotations of equipment to prevent failure.

Reactive Maintenance: no technique-involved equipment has failed

Motor failed on a conveyor replace immediately with spare onsite.

Emergency Maintenance: When a machine is "down" and incapable of making/ doing and there is no spare.

Boiler failure due to a transformer malfunction.

Up Grade Maintenance: Better the equipment then specified by manufacture or engineer.

Thickener – new feed pumps installed due to clogging (Vaughn Pumps now), rotating drums manufactured better then design locally, large gearbox and bearings installed to prevent failures and overheating

Emergency Projects:

- Hurricane Irene – rented a generator to ensure backup power; protected Lower Pump House from river flooding; generator BSI installed, plant staff protected Lower Pump House
- Hurricane Sandy – rented a generator to ensure backup power; protected Lower Pump House from river flooding, generator BSI installed, plant staff protected Lower Pump House
- Boiler failure due to 60 watt transformer failing; took 6 hours to correct; electrician and director corrected

Pottstown
Priority 2/Item 16

Plant Failures

Power outages:
Hurricane Sandy – rented a generator one week before storm hit. During storm both PECO power sources failed. If we did not rent a generator we may have been without power for days because of the massive power outages in the area. We also would of overflowed our system within 15 minutes once power outage occurred due to extreme high flows.

We do experience power blips at least 10 times per year – thunder storms, car accident, transformer failures in PECO system.

The only locations of plant overflows are as follows:

Hurricane Floyd preair over flowed.

Hurricane Irene overflowed headworks due to Lower Pottsgrove surging the plant (only a couple hundred gallons left building). Lower Pottsgrove was still making adjustments to their new system and learning how to use their new pump station. Communication between plant personal occurred immediately to reduce surge in the building – basically the forcemain was shooting out wall like when there is a dam release. Plant staff lifted all gate valves to reduce back pressure on system and preair wall was built by staff to the same level of B side to prevent overflow.

Clarifiers have never overflowed. The weirs become submerged totally and the worse case is about 4 inches from overflowing.

Chlorine contact tank: within inches of overflowing.

Parshal flume: purges water over walls during extreme high flow events but it is only splashing.

Pottstown
Priority 2/Item 17

Pump Station Failures

Memorial Park Pump Station
Has never failed. If computer system fails, back up float system takes over until the computer is reset.

Maintenance issues: one pump failed in 2013 due to a cap and cord failure. Pump is being rebuilt and we always have a cap and cord since it takes months to receive from vendor. Two VFDs failed last year and they have been replaced. They were 19 years old.
Bar screen and commuter failures occur during extreme cold temperatures. They have been taken out of service to be rebuilt.

Circle of Progress Pump Station
Failed in 2012 due to a contact failure and both pumps were unable to pump until staff repaired and reset system. Staff responded immediately and no overflows occurred.

Lower Pump House Station
Has never failed other than in 1996. This was caused by our substation breaker failure which feeds the pump station – plant had a power blip that caused the breaker to trip.

Pump Station Spare Parts

Each pump station has spare pump that are considered our backups.

Memorial Parks
The spare items kept is a cap and cord due to its long lead time – usually 6 months. Just used spare cap and cord in 2014 and one is on order, fuses, and shear pins.

Pottstown
Priority 2 / Item 21

Report Criteria:
Department.Department = "Public Works-WWDist","Sewer Plant"
Employee.Termination Date = {Is NULL}

Name	Yrs of Service	Age	Birthdate	5 YRS	Eligible 10 Years
Becker, Andrew Darren	1	52	09/14/1961		✓
Colon, Luis I.	13	54	02/13/1960		✓
Fulwood, Clifford R.	0	54	07/22/1959		✓
HolzmanVarone, Jessica L.	5	32	10/11/1981		
Horvat, John C.	23	43	06/26/1970		
Johnson, Wayne Scott	32	51	11/13/1962	✓	
Jones, Terry L.	9	49	05/09/1964		
Kulp, Jason L. Sewer Collection	6	40	12/14/1973		
Majka, Gary M.	11	55	10/19/1958	✓	
McMichael, Rodney P.	23	52	11/22/1961	✓	
Mullen, Mark D.	2	59	06/18/1954		✓
Neiman, Randy A.	17	57	09/07/1956	✓	
Ortiz, Orlando	2	59	10/30/1954	✓	
Pennypacker, Kristina M.	14	42	05/08/1971		
Sassaman, Natalee D.	1	23	04/23/1990		
Owens, Karen L.	18	41	09/14/1972		
Wagner, Brent M.	20	43	09/18/1970		✓
Grand Totals: 17					

Normal Retirement Age 60

Early Retirement Age 55 + 25 yrs of Service

Johnson - Current intention to retire in 5 years

Wagner, Nieman, McMichael, Ortiz + Mullen - Current intention to retire in 10 years

Pottstown
Priority 2, Item 14

Communication of Maintenance Issues

1.) Staff uses maintenance boards to communicate an operational issue with equipment, color coded to determine electrical or mechanical issue
2.) Communicate each operational shift
3.) Inform management of maintenance issue if determined to be a major issue

Items 29 & 30- Allocation of costs

Wastewater Treatment Plant (WWTP)-Fund 08

Direct WWTP operating costs including plant payroll, chemicals, utilities, sludge hauling and repairs to machinery and equipment are allocated 100 % to the WWTP in the account group 08.429. While there are some overhead costs such as telephone and postage allocated to this series of accounts, substantially all of the costs are direct charges.

Administrative overhead cost allocations vary by the type of cost and are captured in the functions where they originate. The administrative functions are: Legislation 08.400, Executive 08.401, Finance 08.402, Human Resources 08.406, General Government Buildings 08.409 and Public Works 08.430. Wages in these administrative functions are allocated utilizing the Wage Allocation spreadsheet (attached) prepared in the annual budget development.

Engineering and legal expenses are allocated based on their purpose and most legal and a good amount of the engineering charges are excluded from the allocation to the Townships.

Property and liability insurance is allocated based on property values which are provided by the Borough's insurance agent.

Health and other benefits costs have two components direct and indirect. The allocation is based on the employee census with the direct benefits relating to the WWTP employees and the indirect to the administrative employees.

Technology costs are generally allocated at 27% of the total cost. There are direct charge technology costs, for example, software and support for the bulk hauling program.

Sewer Lines-Fund 18

Maintenance of the sewer collection system is accounted for separately from the wastewater treatment plant. The funding is provided by a transfer from Fund 08.

The allocation process is the same as the WWTP but the percentages vary and are generally lower.

The direct collection costs are captured in account group 18.436.

WWTP Allocation to the Townships

Each year, a Preliminary WWTP Allocation is done to establish the estimated O&M payments for the succeeding year. In accordance with the Sewage Treatment Service Agreement (STSA) this estimate is due to the Townships by October 1 and is based on the preceding twelve months actual cost. The period utilized for the estimate is September 1-August 31. While not required by the STSA, operating costs have been normalized to adjust for extraordinary expenditures such as the extensive dryer maintenance which was done in 2012. The allocation is done based on sewage flows and EDU's provided by the Pottstown Borough Authority (PBA) engineer. Estimated payments are made on a quarterly basis in February, May, August and November.

A Final WWTP Allocation is prepared based actual costs for the period January 1 – December 31. The actual costs are compared to the estimated payments and results in either and additional payment or a credit. The Final WWTP Allocation is included in the Borough's audited financial statements. Additional

payments are due within 30 days of receiving the audit report. Credits are applied to the next O&M payment due to the Borough for the current year.

The Final Wastewater Allocation for 2013 is attached.

Memorandum

Cardno BCM
Shaping the Future

To: Mark Flanders

cc: Tom Carroll
David Renn
Brent Wagner

From: Tom Weld

Date: January 22, 2014

Subject: Pottstown Borough Authority
Wet Weather Flow Options
BCM Project No. 57.50766.1100 (108)

Historically the WWTP has experienced flows that have exceeded the peak design flow of 32 MGD, without exceeding the NPDES permit. In the last 3 years, the plant has exceeded 32 MGD approximately 33 times. Based on the observations of the water levels, in the Parshall Flume and the Chlorine Contact Tanks by plant staff, it was calculated that the WWTP processed flows of approximately 42 to 44 MGD. During these events, the Staff evaluated the weather conditions as to the intensity of the storm and the anticipated length of the storm, and implemented the current High Flow Procedures when necessary. Once the second Parshall Flume is installed, the plant staff will be able to develop an historic record of peak flows, which until now, are estimated.

Over the period of 2008 to 2012, the Average Dry Weather flow to the WWTP was 4.1 MGD (26% of design capacity) and the Average Daily Flow was 6.4 MGD (41% of capacity). However, during the same period the Peak Flows have been greater than 100% of design peak hydraulic capacity of 32 MGD.

If the projected flows that are anticipated in Lower's Act 537 Plan update, dated October 2009; Upper's Act 537 Plan, dated April 2009; West's 2012 Chapter 94 and Pottstown's 2012 Chapter 94 are realized, the Average Daily Flow from the last 5 years of 6.4 MGD could increase to 7.0 MGD. If the estimated peak flow to the WWTP is not significantly reduced, and the infiltration/inflow (I/I) from new connections is not controlled, the future peak flow could be as much as 46 to 48 MGD. These estimates are based on proportioning the calculated peak flow to the estimated future Daily Flow of 7.0 MGD.

The concern that the Staff has regarding the future peak flow is exhibited by the events that have occurred with Lower's flow to the WWTP. Lower's 537 update, dated October 2009, projected that the Township would require a peak flow rate of 11,800 GPM to address the current flows and future flows over approximately the next 20 years. It is our understanding that very little of

the anticipated expansion has taken place. But on several occasions in 2011, the flow from Lower exceeded their future (±20 years out) anticipated peak flow of 11,800 GPM and was recorded at 14,000 gpm. Since 2011, the peak flows from Lower have approached 10,000 GPM on several occasions.

It does not appear that the peak flows to the WWTP will drop significantly in the short term and the WWTP will be required to process flows that exceed the design capacity of the WWTP. Currently each of the municipalities has an I/I program in place that should result in some reduction in the peak flow that hopefully will offset the flows from the additional connections that are currently in the planning stage.

The critical areas within the WWTP that are affected by wet weather peak flows are the hydraulic capacity of the plant and the ability to settle the solids prior to discharge from the plant. It has been calculated that the plant has processed approximately 42 to 44 MGD. The amount of flow that the plant can process will be quantified once the second Parshall Flume is installed and operational. The Staff has demonstrated that the existing clarifiers can process 32 MGD and be in compliance with the NPDES permit. However, with flows in excess of 32 MGD, the clarifiers are beyond their design range, even though there is significant documentation[(1)(2)(3)(4)(5)] that clarifiers of this type, under peak flow conditions, could process up to 34 MGD (1600 GPD/ft^2) or more to address wet weather flows. There are several options to address the impact that high flows have on the settleability of the solids during high flows.

- Install a third clarifier (utilizing the same design parameters as the existing clarifiers)
  - 80' ∅ clarifier would increase the peak flow to 39.5 MGD (23% increase)
  - 85' ∅ clarifier would increase the peak flow to 40.5 MGD (25% increase)
  - 90' ∅ clarifier would increase the peak flow to 41.5 MGD (30% increase)

- Install BioMag system to increase the settleability of the solids. This process requires significant infrastructure, and may have a negative impact on the ability to dispose of sludge. It has been reported that the process loses 3 to 5% of the BioMag in the sludge. There is not sufficient data to determine the ultimate impact that the BioMag would have on Pottstown's sludge handling program. The implementation of this process is estimated to cost between $5,500,000 and $6,500,000.

- Install offline equalization basins, either at the WWTP or in the municipalities. (PADEP is not in favor of this approach. Permitting an equalization basin at this time may not be possible. Also, this type of facilities is labor and maintenance intensive.)

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(1) ASCE Manual and Report on Engineering Practice No. 16

(2) WEF Manual of Practice 8

(3) Secondary Clarifier Design Concepts and Considerations

(4) Alternative Secondary Clarifier Designs for Managing Wet Weather Flows

(5) Getting More Out of Secondary Clarifiers for Wet Weather Flow Management Using State of the Art Tools

- Modifications to the Process Train. (This option has been given an in-depth evaluation by the operating staff. They feel this option would not control the solids and has a great potential for causing operational issues with the activated sludge process.)

- Implement a Blending system to divert some flow around the clarifiers. (This process is not acceptable by PADEP, but at least one state has overturned EPA's No Blending Rule. Based on PADEP's current position, it may take years for blending to be accepted in Pennsylvania.)

- Continue to implement and improve the Wet Weather Flow procedure.

The estimated current peak flow as noted above is 42 to 44 MGD (assume 43 MGD). With the addition of an 85' ∅ clarifier, the peak design flow of the three clarifiers would be at least 40.5 MGD. Utilizing the Wet Weather Procedures, the plant has successfully processed an estimated flow of 43 MGD or 11 MGD greater than the design flow. With the two existing clarifiers and the addition of an 85' ∅ clarifier, and the implementation of the Wet Weather Procedures, the plant can successfully process at least 51.5 MGD. With a large diameter third clarifier and the Wet Weather Procedures, the plant can process up to at least 52.5 MGD. Installing either of the clarifiers would significantly increase the ability of the plant to process the current and future peak flow while the municipalities aggressively address and reduce their I/I.

The order of magnitude estimate for the installation of the third clarifier, considering significant allocation to address regulated soil which would require special disposal, is $2,000,000.

Refer to the attached Table A for the percentage of pipe that each of the municipalities would be able to replace in their system, to address infiltration/inflow, for the amount of dollars that they would contribute for a third clarifier. If each municipality would use the same amount of money as needed for the share of the third clarifier to improve their individual collection system, it would not be enough to achieve a positive reduction in infiltration/inflow equal to the amount of additional flow that can be processed with a third clarifier. For the foreseeable future, the addition of a third clarifier and continued implementation of the Wet Weather Procedures appear to be the most implementable, reliable and flexible of the available options to address the increase in the peak flow at the WWTP. The success of any one of the options is based on an aggressive effort by all of the municipalities to reduce and control their respective I/I.

The addition of the third clarifier would increase the available clarifier capacity from 50% to 75% when one of the clarifiers is taken out of service for maintenance. Having 75% available capacity, with one clarifier out of service, will provide more operational flexibility to the Staff in addressing emergency repairs and scheduled maintenance.

TLW/plk
Attachment
tlw\potts\gencor\high flows 1-7-14

TABLE A

POTTSTOWN WASTEWATER SYSTEM

Potential Rehabilitation Costs

Additional Clarifier at WWTP	$2,500,000	
Replacement Gravity Sewer Pipe	Based on 8-inch Pipe at 6-8 feet deep with Manholes and Township/Borough paving, including 10% for Eng., Admin. & Legal fees	$175 per foot
	Amount of Pipe Replacement to Equal Clarifier Cost	12,857 feet

Based on Current Breakdown of Plant Costs

	Percentage of Responsibility	Clarifier Responsibility	Replacement Pipeline	Existing Pipeline	Percentage Replacement
	%		(feet)	(feet)	%
Pottstown Borough	59.67	$1,491,625	7,671	369,600	2.1
Lower Pottsgrove	26.28	$656,875	3,378	254,856	1.3
Upper Pottsgrove	3.80	$95,000	489	71,000	0.7
West Pottsgrove	10.26	$256,500	1,319	58,000	2.3
Total	100.00	$2,500,000	12,857	753,456	6.4

Appendix E

PRELIMINARY

POTTSTOWN BOROUGH AUTHORITY
2013 WASTEWATER SYSTEM FINAL RECONCILIATION
BASED ON THE PERIOD JANUARY 1, 2013 TO DECEMBER 31, 2013

	Basis Of Allocation	Annual Cost 1/1/2013-12/31/2013	Less: Lower Pottsgrove		Net Cost	Upper Pottsgrove		West Pottsgrove		Pottstown
Annual System Costs										
2 Wastewater Treatment	A/B	$ 2,860,012	$ 771,283	(1)	$ 2,088,729	$ 178,927		$ 337,254	(1)	$ 1,572,549
3 Administration										
Legislative Body	A/B	11,293	3,186		8,107	706		1,325		6,077
Executive	A/B	51,355	14,487		36,869	3,209		6,026		27,634
Auditing Services/Accounting	A/B	191,204	29,090	(2)	162,114	12,407	(4)	23,299	(4)	126,408
Legal	A/B	4,199	1,185		3,015	262		493		2,260
Human Resources	A/B	36,078	10,177		25,901	2,254		4,233		19,413
IT-Web Network Services	A/B	30,643	7,185	(3)	23,458	2,042		3,834		17,582
Engineering	A/B	86,186	24,312		61,874	5,385		10,113		46,376
General Gov. Bldg. & Plant	A/B	34,231	9,656		24,575	2,139		4,017		18,419
Public Works	A/B	6,136	1,731		4,405	383		720		3,302
Miscellaneous	A/B	687	194		493	43		81		370
Insurance	A/B	54,759	15,447		39,312	3,422		6,425		29,465
Employee Benefits	A/B	317,694	89,617		228,077	19,851		37,278		170,948
		824,466	206,266		618,200	52,103		97,844		468,253
4 Sewer Lines										
5 Porter Road Pump Station	C	18,547	1,351		17,196	2,338				14,858
6 Electric-Pump Stations	B	25,431			25,431	-		11,611		13,820
7 Maint. & Repairs Sewer Lines	B	91,352			91,352	7,951		14,931		68,470
8 Maint. Of Meters	B	384			384	33		63		288
9 Elec. Flow Meter	B	535	151		384	33		63		288
Total System Costs		3,820,727	979,051		2,841,676	241,385		461,765		2,138,525
Deductions-Revenue										
12 PEMA Grant	A/B	44,022	12,418		31,604	2,751		5,166		23,688
13 MIPP	A/B	11,881	3,351		8,529	742		1,394		6,393
14 Violations, Inspections, Permits	A/B	11,420	3,221		8,199	714		1,340		6,145
15 Sewer Bulk Collection	A/B	2,021,804	570,325		1,451,480	126,332		237,238		1,087,910
16 Waste Mgmt.-Leachate	A/B	91,114	25,702		65,412	5,693		10,691		49,027
17 Wage Allocation-06	A/B	40,371	11,388		28,983	2,523		4,737		21,723
18 Energy Capacity Payments	A/B	2,844	802		2,042	178		334		1,530
19 Scrap Sales	A/B	1,689	477		1,213	106		198		909
Total Deductions-Revenue		2,225,146	627,685		1,597,461	139,038		261,098		1,197,326
Net System Costs		$ 1,595,581	$ 351,366		$ 1,244,215	$ 102,347		$ 200,667		$ 941,199
Final Allocation %		100%	22.02%			6.41%		12.58%		59.00%
2013 Quarterly Payments			$ 411,613			$ 154,510		$ 211,747		
Due to Borough			**$ (60,247)**			**$ (52,163)**		**$ (11,080)**		

POTTSTOWN BOROUGH AUTHORITY
BASIS OF 2013 FINAL RECONCILIATION

PRELIMINARY

Lower Pottsgrove Township Allocation Based on Metered Flow

Plant Flows 1/1/2013-12/31/2013 (gallons)	2,170,912,000
Lower Pottsgrove Flows 1/1/2013-12/31/2013	612,386,149
Basis of 2013 Final Reconciliation	28.21%

Pottstown, Upper Pottsgrove and West Pottsgrove Flow Allocation-metered flow

	Flow	% Allocation
Borough of Pottstown	1,168,142,877	74.95%
Upper Pottsgrove	135,649,254	8.70%
West Pottsgrove	254,733,719	16.34%
Total	1,558,525,850	100.00%

North End EDU's

	EDU's	% Allocation
Borough of Pottstown	286	80.11%
Upper Pottsgrove	45	12.61%
Lower Pottsgrove	26	7.28%
Total	357	100.00%

Appendix F

Pottstown Borough Authority
5 Year Capital Plan
Sewer
2014 to 2018

Draft - 7/29

Project #	Projects WWTP	Share	Inception	Anticipated Close	Total Cost	2014	2015	2016	2017	2018	
2300	WWTP Modifications-2013	All	2013	2016	1,600,000	200,000	1,320,000	800,000			2,320,000
	Bulk Unloading Station										-
	WWTP Effluent Meter										-
	Sludge Pump modifications										-
1292	Lower Pump House Meter	PT/UPT	2013	2015	105,000	75,000	30,000				105,000
1291	Memorial Park Pump Station Meter	PT/WPT	2013	2015	105,000	75,000	30,000				105,000
1294	Circle of Progress	PT	2013	2015	35,000	30,000	5,000				35,000
	Phosphorous Removal (if required by new permit)	All	2015	2017	400,000		50,000	300,000	50,000		
	High Flow Modifications	All	2016	2018	2,500,000			200,000	1,600,000	700,000	
	Rehabilitation of Screw Pumps(5)- one in progress from 2013 in Opreation Budget	All	2014	2018	570,000	$50,000	$130,000.00	130,000	130,000	130,000	
	Security System w/ Phone	All	2014	2016	250,000	10,000	100,000	140,000			
	Fiber Optics & Phones										
	Camers and Gates										
	SCADA Computers (coordinate with WTP & Borough Hall)	All	2014	2015	45,000	10,000	35,000				
	PLC upgrades including new @ Cir of Progress and Mem Pk PS	All	2014	2016	250,000	20,000	180,000	60,000			
											-
	Total Plant Projects				5,860,000	470,000	1,880,000	1,630,000	1,780,000	830,000	
	Sewer Collection System										
	Sewer Line Replacement (2013)	PT	2013	2016	3,000,000	310,000	2,490,000	200,000			
	Sewer Line Replacement (2015)	PT	2015	2017	3,000,000		100,000	2,850,000	50,000		
	Sewer Line Replacement (2017)	PT	2017	2018	3,000,000				100,000	2,850,000	
	Total Collection Projects				9,000,000	310,000	2,590,000	3,050,000	150,000	2,850,000	
	Total Sewer Capital Projects				14,860,000	780,000	4,470,000	4,680,000	1,930,000	3,680,000	

			Requested Purchased Capacity	Allocation %	
	Evaluations for possible future capital plans	PT	9.3079%	59.67%	
	Generator(s) - (2014)..... .....$10,000	LPT	4.1000%	26.28%	
	Screen Bldg - Replace or modify equipment (2014).....$10,000	WPT	1.6000%	10.26%	
	Grit Facility - Upgrade equipment (2014)..... .....$10,000	UPT	0.5921%	3.80%	
	Replace blowers w/ PD units, Areation sys. w/ DO controls (2015) $15,000		15.6000%	100.00%	

Basis For Allocation of Pump Stations

	Mem Park	LPH	Cir of Prog
PT	50%	80%	100%
WPT	50%	20%	
UPT			

POTTSTOWN BOROUGH AUTHORITY
CAPITAL PLAN 2014/2018
WWTP & COLLECTION SYSTEM
(Edition 2)

DRAFT

	Estimated Project Cost	Implementation Schedule
1. Wastewater Treatment Plant (Authority and Townships)		
a. Lower Pump House and Memorial Park Meters		2014
b. Bulk Unloading Station		2014/2015
c. WWTP Effluent Meter		2014/2015
d. Rehabilitation of Screw Pumps		2014/2018
e. Sludge Pump Modifications		2014/2015
f. Migration of Computers (Coordinate w/WTP and Borough Hall)		2014/2016
g. Evaluate Rags in RAS		2014/2015
h. Evaluate Need for Generator		2014/2015
i. Internal Communications System (Coordinate with Computers, SCADA, and Security)		2015/2016
j. Phosphorous Removal (Permit Dependent)		2015/2017
k. Complete SCADA System for Monitoring including Circle of Progress and Memorial Park Pump Stations		2015/2017
l. Evaluate Replacement of Comminutors		2015/2016
m. Evaluate Replacement of Bar Screens		2015/2016
n. Evaluate Additional Third Bar Screen		2015/2016
o. Plant Security		2016/2017
p. Replace Aeration Blower with DO Control		2016/2017
q. High Flow Modifications		2016/2018
2. Collection System (Authority)		
a. Sewer Line Replacement (2013)		2014/2015
b. Circle of Progress Meter		2014/2015
c. Security at Sewage Pump Stations		2016/2018
d. Sewer Line Replacement (2015)		2015/2016
e. Sewer Line Replacement (2017)		2017/2018

Appendix G

Region 1
15 or Fewer Employees
21 Responses

Employee Position	Number of Responses	Low	Average	High
Accounts Receivable Billing Clerk	7	27000	30269	50000
Assistant Manager	3	30000	56080	80000
Assistant Supervisor/ Foreman	1	46500	46500	46500
Bookkeeper	6	31044	34703	50000
Collection/Distribution Equipment Operator	1	30704	30704	30704
Collection/Distribution Laborer	4	35000	40477	44583
Collection/ Distribution – Supervisor/Foreman	3	40000	46903	56302
Incinerator Operator	0	0	0	0
Janitor	0	0	0	0
Laboratory Technician	5	34112	42581	66000
Maintenance Helper	1	29000	29000	29000
Maintenance/Mechanic	4	42452	40052	65894
Maintenance/Supervisor/ Foreman	4	44408	41183	55509
Manager	14	48000	77404	10700
Meter Department Supervisor	0	0	0	0
Meter Reader/ Repair/ Maintenance	1	41000	41000	41000
Office Administrator	5	36000	42632	50000
Office Manager	1	71000	71000	71000
Plant Manager	8	52832	66923	100600
Plant/Pump Operator A	9	44408	48253	53000
Plant/Pump Operator B	4	31200	33713	50000
Plant/Pump Operator C	1	42500	42500	42500
Secretary	2	38000	43250	48500
Utility Man	0	0	0	0
Waste Station Coordinator	0	0	0	0
Weigh Master	0	0	0	0

All Regions
15 or Fewer Employees
169 Responses

Employee Position	Number of Responses	Low	Average	High
Accounts Receivable Billing Clerk	40	13000	31593	50000
Assistant Manager	25	15000	49117	80000
Assistant Supervisor/ Foreman	8	38000	49758	57500
Bookkeeper	19	11000	37614	50000
Collection/Distribution Equipment Operator	7	30704	42258	75462
Collection/Distribution Laborer	17	26915	37529	49940
Collection/ Distribution – Supervisor/Foreman	18	27123	51688	71600
Incinerator Operator	1	75000	75000	75000
Janitor	3	16640	23006	29500
Laboratory Technician	16	34112	43767	66000
Maintenance Helper	5	14552	30144	39970
Maintenance/Mechanic	19	25000	38510	49000
Maintenance/Supervisor/ Foreman	18	32600	47898	64600
Manager	84	24000	64861	107000
Meter Department Supervisor	2	58350	58437	58524
Meter Reader/ Repair/ Maintenance	7	29120	39321	50000
Office Administrator	52	18746	37417	56700
Office Manager	13	30000	49374	72000
Plant Manager	38	30000	51581	85000
Plant/Pump Operator A	59	25193	41149	55500
Plant/Pump Operator B	33	25938	37117	85194
Plant/Pump Operator C	10	23500	31479	42500
Secretary	26	17804	32178	51952
Utility Man	9	28142	38656	49712
Waste Station Coordinator	0	0	0	0
Weigh Master	0	0	0	0

Region 1
15 or Fewer Employees
Fringe Benefit Survey
Total Number of Survey Responses = 21

	Low	Average	High
Number of Employees	1	6	12
Average Administrative Pay Increase	1.2	2.7	4
Average Operations Pay Increase	1.2	2.7	4

Holidays (Numbers Indicate Count of "Yes" Responses)

6	New Year's Eve Day	4	Columbus Day
19	New Year's Day	6	Election Day
5	Martin Luther King Day	9	Veterans Day
14	President's Day	20	Thanksgiving Day
17	Good Friday	17	Day after Thanksgiving
2	Primary Election Day	0	First Day of Deer Season
20	Memorial Day	9	Christmas Eve Day
20	Fourth of July	20	Christmas Day
19	Labor Day		

Personal Days (Numbers Indicate Count of Employees)

3	0 Days	5	3 Days
0	1 Day	9	4 Days or More
3	2 Days		

Bereavement Leave (Numbers Indicate Count of "Yes" Responses)

2	0 Days	13	3 Days
0	1 Day	0	4 Days
2	2 Days	3	As Needed Basis

Vacation Leave

	Up to 5 Days	6 to 10	11 to 15	16 to 20	21 to 25	More than 25
One to two years	10	9	0	0	0	0
Three and five years	1	13	4	0	0	0
Six to ten years	0	3	11	4	0	0
Eleven to fifteen years	0	1	5	10	1	1
Sixteen to twenty years	0	0	1	13	3	2
More than twenty-five years	0	0	1	6	7	3

18 Are vacation days provided based on years of service?
8 Can employees accumulate vacation days?
8 If accumulation is allowed, is there a limit?
5 If employee doesn't use all vacation, do you pay them for days not used?

Health Benefits (Numbers Indicate Number of "Yes" Responses)

0 100% employee paid
15 100% employer paid
4 Joint employee/employer paid
6 Employee paid deductible
5 Employer paid deductible
14 Employer-provided dental care
7 Is there a dollar limit on dental care
14 Employer-provided vision care
8 Is there a dollar limit on vision care
19 Do you have prescription plan
8 Do you pay for employee immunizations

Sick Leave (Numbers Indicate Days of Sick Leave)

	Up to 5 Days	6 to 10	11 to 15	16 to 20	21 to 25	More than 25
One to two years	5	7	5	0	1	0
Three and five years	3	8	4	0	0	1
Six to ten years	3	7	4	1	0	1
Eleven to fifteen years	3	6	5	1	0	1
Sixteen to twenty years	3	6	3	2	1	1
More than twenty-five years	3	6	3	2	1	1

9 Are sick days provided based on years of service?
14 Can employees accumulate sick leave
11 If accumulation is allowed, is there a limit
15 Do you have a short-term disability plan
13 Do you have a long-term disability plan

Maternity Leave (Numbers Indicate Count of "Yes" Responses)

5 Paid Leave
5 Unpaid Leave
7 Combination of the Two

Life Insurance (Numbers Indicate Count of Yes Responses)

18 Do you provide life insurance
0 100% employee paid?
18 100% employer paid?
0 Joint employee/employer paid?
1 Do you carry life insurance for your board members?

Management

2 Less than one year salary
2 One year salary
3 Eighteen months salary
2 Two years salary
0 More than two years regular pay
3 Other

	Low	Average	High
Fixed Amount	25,00	61,875	100,000

3 Does your policy allow conversion if the employee terminates or retires?

Other Employees

2 Less than one year salary
2 One year salary
4 Eighteen months salary
1 Two years salary
0 More than two years regular pay
2 Other

	Low	Average	High
Fixed Amount	15,000	43,333	50,000

3 Does your policy allow conversion if the employee terminates or retires?

Pension (Numbers Indicate Count of "Yes" Responses)

17 Do you have a pension plan
1 Is Social Security integrated with your pension plan
7 Can an employee retire on fixed number of years of service only?
11 Does authority pay 100% of pension cost?

Education Expenses (Numbers Indicate Count of "Yes" Responses)

18 Are education expenses reimbursed
3 Do you require reimbursement of educational expenses upon employee leaving the authority

	Low	Average	High
Percentage reimbursed for management	100	100	100
Percentage reimbursed for employees	100	100	100

Other Benefits

14 Do you provide employee uniforms?
19 Do you provide safety equipment?
13 Do you have an on-call policy?

Overall benefit cost per employee in dollar amount:

	Low	Average	High
	2,000	17,326	30,000

Appendix H

Calculation:
Employee Health and Safety Severity Rate = 200,000 (Total Days Away from Work) / Total hours worked by all employees
Definitions:
· Total workdays away from work are obtained directly from OSHA Form 300A (or state counterpart) Summary of Work-Related Injuries and Illnesses.
· Total hours worked by all employees is the sum of hours actually worked by full-time, part-time, temporary and seasonal employees of the utility.
Visit www.osha.gov for a complete explanation of this indicator, including applicable definitions.

Calculation:
Training Hours per Employee = Total of qualified formal training hours for all employees / Total FTEs worked by employees during the reporting period
Definitions:
· Sum of all qualified formal training hours completed by all employees
· Total hours worked by all employees is the sum of hours actually worked by full-time, part-time, temporary and seasonal employees of the utility.

Calculation:
MGD processed per employee = Average MGD processed / Number of full time equivalents
Definitions:
· Average daily volumes processed are calculated by dividing the total volume of wastewater processed during the reporting period by 365.
· A full-time equivalent (FTE) is the allocation of employee time equal to 2080 hours per year. Use of this term allows data to be normalized around a common measure. Part-time, temporary, and seasonal employees are converted to FTEs based on the total number of compensated hours. Employee time from contracts supporting utility operations and maintenance are applied in the same way. Employee time from engineering and construction of new facilities are not counted in these indicators.

Calculation:
Number of Regular Employee Departures
Employee Turnover Rates = x 100
Average Number of Regular Employees
Definitions:
Number of regular employee departures includes the number of regular employees who terminated from employment through voluntary, involuntary, or retirement reasons during the reporting fiscal year period. Regular employees are those employees who worked more than 1000 hours for the most recent annual basis of reporting. Average number of regular employees is the sum of the number of regular employees at the end/beginning of each month for the total of a 12-month fiscal year divided by 12.

Number of Internal Promotions
Internal Employee Promotions = x 100
Total Number of Positions Filled
Definitions:
Promotions are based on employees who transfer to a classification that involves an increase in responsibility, not just pay increases. The number of current regular or part-time employees during the reporting fiscal year, who were promoted to "fill" positions. The total number of positions filled is based on positions that were opened or "posted" and filled during the reporting fiscal year. If a promotion was made without an "opening" or "posted" position, it will be included as a promotion if the position remains as a "regular (full-time) position.

Calculation:
Retirement Eligibility = Number of Regular Employees Eligible for Retirement within Next Five Years x 100 Average Number of Regular Employees
Definitions:
Retirement eligibility for each employee is based on known eligibility from age and employment history, according to a utility's retirement program and policies. Regular employees are those employees who worked more than 1000 hours for the most recent annual basis of reporting. Average number of regular employees is the sum of the number of regular employees at the end/beginning of each month for the total of a 12-month fiscal year divided by 12.

The debt ratio quantifies the utility's level of indebtedness.
Calculation:
Debt Ratio = Total Liabilities / Total Assets
Definitions:
· Total liabilities are the entire obligations of the utility under law or equity. (They are categorized as such on the utility's financial statement. In essence, they are the total amount of dollars owed to others. Liabilities are defined and designated by the Government Accounting Standards Board (GASB) or the Financial Accounting Standards Board (FASB) (as applicable to each specific utility). They include outstanding bonds, outstanding long-term debt, outstanding short-term debt, payments owed to others, accounts payable, and deposits collected from customers.)

· Total assets are the entire resources of the utility, both tangible and intangible. (They are categorized as such on the utility's financial statement. They include the total value of properties and claims against others that are owned by the utility as expressed at original cost. Assets are defined and designated by the Government Accounting Standards Board (GASB) or the Financial Accounting Standards Board (FASB) (as applicable to each specific utility). They include accounts receivable, cash, inventories, service delivery facilities (less depreciation), cost of easements, cost of water rights, and all other items of value owned by the utility.

System renewal/replacement rate Purpose:
This indicator quantifies rate at which the utility is meeting its individual need for infrastructure renewal or replacement.
Calculation:
100*(actual expenditure and reserve / total present worth of renewal and replacement needs for each asset class)
Definitions:
· Wastewater collection assets include all piping, manholes, clean-outs, pumping facilities and force mains used to convey wastewater to a central location for treatment.
· Wastewater treatment facilities include all assets at each facility used to treat wastewater, treat and dispose of solids, and protect air quality.
· Wastewater miscellaneous assets include office buildings, maintenance facilities, and laboratories not associated with process control.

Purpose:
Return on assets measures the financial effectiveness of the utility.
Calculation:
Return on Assets = Net Income / Total Assets
Definitions:
· Net Income is titled as such on the utility's financial statement, and is defined and designated by the Government Accounting Standards Board (GASB) or the Financial
Accounting Standards Board (FASB), as applicable to each specific utility.
· Total assets are the entire resources of the utility, both tangible and intangible. (They are categorized as such on the utility's financial statement. They include the total value of properties and claims against others that are owned by the utility as expressed at original cost. Assets are defined and designated by the Government Accounting Standards Board (GASB) or the Financial Accounting Standards Board (FASB) (as applicable to each specific utility). They include accounts receivable, cash, inventories, service delivery facilities (less depreciation), cost of easements, cost of water rights, and all other items of value owned by the utility.)

Purpose:
To measure the number of days of available cash reserve as an indicator f financial liquidity. Days of reserve available is based on undesignated cash reserves and continued
cost of ongoing operations (according to the most recent fiscal year or last 365 days of cost of ongoing operations).
Calculation:
Cash Reserve = Undesignated Cash Reserve Dollars
Cost of Ongoing Operations, Average $/Day
Definitions:
Undesignated Case Reserves are available cash used to pay the cost of ongoing operations; not committed to debit payments or other covenants. Ongoing cost of operations is the total annual utility cost of operations for the most recent fiscal year reporting period, divided by 365 to indicate $/day.

Energy Consumption Efficiency for Wastewater = Definitions: Direct energy consumed to collect and treat wastewater (kWh)
Volume of wastewater collected and treated (MG)
Definitions:
Annual energy consumption includes purchases of electricity, natural gas, fuel oil, propane (and other crude oil derivatives). Energy consumption efficiency is expressed as
kilowatt-hour per million gallons (KWh/MG). Annual energy consumed is based on purchases of electricity, natural gas and other fuels (minus stored amounts), all converted to kWh. Annual volume of water supplied or wastewater collected/treated is based on measured flows inn MG. Annual measures are for the same most recent fiscal year reporting period (provide data in attached Energy Efficiency Table).

Purpose:
This indicator is designed to allow comparison of how effectively utilities are investing in planned maintenance.
Calculation:
· Planned Maintenance Ratio in Percent (Hours) = (100) Hours of Planned Maintenance / (Hours of Planned + Corrective Maintenance)
· Planned Maintenance Ratio in Percent (Cost) = (100) Cost of Planned Maintenance / (Cost of Planned + Corrective Maintenance)
Definitions:
· Planned maintenance is all maintenance undertaken in advance of asset failure. Planned maintenance may be predictive or preventive. · Corrective maintenance is all maintenance undertaken after asset failure.

This indicator provides a measure of collection system piping condition and the effectiveness of routine maintenance by quantifying the number of sewer overflows per 100 miles of collection piping.

Calculation:
Sewer Overflow Rate = 100 (Total number of sewer overflows during the reporting period) / Total miles of pipe in sewage collection system
Definitions:
· An overflow refers to a discharge from a sewer through a manhole, clean-out, pumping facility, customer floor drain, or the drain in a fixture, if that discharge is related to limitations or problems with collection or treatment system components under control of the utility. Overflows caused by limitations or problems within customer-controlled piping and facilities are specifically excluded from this definition. A single limitation or problem can result in multiple overflows.
· A dry weather sewer overflow is an overflow from a combined sanitary/storm sewer experienced during weather conditions where the portion of flow attributed to storm water is negligible.
· The collection system is comprised of all gravity sewerage piping, manholes, pressure sewers and lift stations under control of the utility from the point of customer property lines to the treatment facility or point of interception by another wastewater utility. Portions of the collection system may convey both sanitary sewage and storm water.

This indicator provides a measure of the condition of a sewage collection system. The indicator expresses the number of collection system failures each year per 100 miles of
collection system piping.
Calculation:
Failure Rate = 100 (Total number of collection system failures during the year) / Total miles of collection system piping
Definitions:
· Collection system means all gravity sewerage piping, manholes, pressure sewers and lift stations under control of the utility from the point of customer property lines to the treatment facility or point of interception by another wastewater utility. Portions of the collection system may convey both sanitary sewage and storm water.
· A collection system failure means a loss of capacity resulting from a flow restriction in gravity or pressurized sewer systems. Flow restrictions may be caused by deposition of foreign materials; structural failures of pipes, appurtenances, or manholes; deterioration of collection system materials; and root intrusion. Low spots in gravity sewers (sometimes called "swags") are failures if there is potential for deposition and diminished sewer capacity. If left unattended, collection system failures can result in cave-ins, back-ups or overflows. Maintenance activities such as sewer cleaning, rodding, root removal, and minor repairs to minimize infiltration or inflow are not collection system failures. Electrical and mechanical lift station failures unrelated to flow restrictions, electrical power outages at lift stations, and failures that occur on customer properties, are not counted as failures for the purpose of this indicator. Excludes any failure directly caused by the action of a person authorized by the utility such as failure caused by incidental damage during construction/repair or incorrectly

Purpose:
This indicator quantifies a utility's compliance with the effluent quality standards in effect at each of its wastewater treatment facilities. The indicator is expressed as the percent
of time each year that an individual wastewater treatment facility is in full compliance with applicable effluent quality requirements.
Calculation:
WWTER = 100 (365 – Total number of standard non-compliance days) / 365
If there are multiple facilities, an average is used.
Definitions:
· An operating/discharge permit is one issued through the National Pollutant Discharge Elimination System or its equivalent delegated state program.
· A standard non-compliance day is any day during which the wastewater utility, through actual monitoring, determines that it has not met one or more of its permitted effluent
quality standards at an individual treatment facility

O and M cost per account
- O and M cost per MG processed
- Direct cost of treatment per MG

Purpose:
Three indicators each are proposed for wastewater utilities to quantify all utility costs related to operations and maintenance, with break-outs of those costs related to
wastewater treatment, as related to volumes processed and the number of active customers.
Calculation:
· O M Cost per Account = Total Operations Maintenance Costs (less depreciation) / Total number of active customer accounts
· O M Cost per MG Processed = Total Operations Maintenance Costs (less depreciation) / Volume processed during the reporting period (in MG)
· Direct Cost of Treatment per MG = Total Direct O M Costs for Wastewater Treatment / Volume processed during the reporting period (in MG)
Definitions:
· Active customer account means all customer accounts of all classes that were billed for some or all of the reporting period. A single account may include service through more
than one sewer service connection.

· Total volume processed refers to the total volume of wastewater processed by the utility during the reporting period. It is reported in millions of gallons.
· Total direct operations and maintenance costs for wastewater treatment is the total costs for salaries, direct benefits, and direct operational and maintenance costs associated with treatment. It includes pumping costs only within treatment facilities but not those associated with delivery of wastewater to treatment facilities nor those associated with discharge of treated solids or liquids leaving wastewater treatment facilities. Costs of solids treatment are included.

Appendix I

Borough of Pottstown
2013 Budget
Sewer Fund and Sewer Lines

		2013 Budget
08 SEWER FUND		
08.341.10C	Interest	-$12,000.00
	TOTAL INTEREST	-$12,000.00
08.357.02C	PA Emerg. Mgmt Grant	$0.00
	TOTAL STATE & LOCAL	$0.00
08.364.01C	EDU Sewer Usage Fee	-$5,200,000.00
08.364.10C	Sewer Tapping Fees	-$45,000.00
08.364.101	Sewer Connect/Application Fee	-$8,500.00
08.364.104	Sewerage - Permits	-$100.00
08.364.105	Fog Permits, Inspect. & Violations	-$9,000.00
08.364.11C	Penalties & Interest	-$100,000.00
08.364.12C	Sewer Bulk Collection	-$1,750,000.00
08.364.13C	Waste Mgmt Leachate	-$150,000.00
08.364.14C	MIPP - Lab Analytical	-$5,000.00
08.364.141	MIPP - Concentration Surcharge	$0.00
08.364.60C	Lower Pottsgrove Contrib.	-$411,613.00
08.364.601	Upper Pottsgrove Contrib.	-$154,510.00
08.364.602	W. Pottsgrove Cont.	-$211,747.00
08.364.90C	U. Pottsgrove - Debt Contrib.	$0.00
	TOTAL SANITATION	-$8,045,470.00
08.380.10C	Miscellaneous Sales	-$25.00
	TOTAL MISC.	-$25.00
08.389.01C	Bid Deposits	-$10.00
08.389.10C	Settlement (Cert) Fee	-$9,000.00
08.389.106	Refund Wage Alloc fr 06 - (1/2 Maul)	-$38,479.00
08.389.20C	EnerNOC Capacity Payment	-$10,000.00
08.389.30C	Sale of Scrap Material	-$1,000.00
08.389.40C	Restitution for developer sewer	$0.00
	TOTAL WAGE REFUNDS	-$58,489.00
08.392.018	Transfer from Fund 18	$0.00
08.392.09C	Transfer from Fund 90	$0.00
	TOTAL TRANSFERS	$0.00
08.395.10C	Refunds of current expenses	-$100.00
08.395.20C	Refunds of Prior Yr expenses	-$100.00
	TOTAL REFUNDS	-$200.00
08.399.10C	Transfer from Reserves	$0.00
	TOTAL TRANSFERS	$0.00

	TOTAL REVENUES -08	-$8,116,184.00
08.400.21C	Office Supplies	$100.00
08.400.241	General Government Supplies	$100.00
08.400.341	Advertising	$2,664.00
08.400.342	Printing/Binding	$67.00
08.400.42C	Dues, Subscriptions & Member	$3,930.00
08.400.425	Meetings, Seminars & Conferences	$152.00
08.400.53C	Subsidy to Fund 01	$3,122.00
	TOTAL LEGISLATIVE -08	$10,135.00
08.401.21C	Office Supplies	$630.00
08.401.211	Copier Shared Usage Costs	$152.00
08.401.231	Vehicle Fuel-Gasoline	$400.00
08.401.241	General Government Supplies	$50.00
08.401.251	Vehicle Parts	$17.00
08.401.321	Tele Monthly Charges	$306.00
08.401.325	Postage	$101.00
08.401.341	Advertising	$42.00
08.401.342	Printing/Copying	$17.00
08.401.353	Surety and Fidelity	$0.00
08.401.374	Repairs -Machinery and Equipment	$0.00
08.401.42C	Dues, Subscriptions & Member	$167.00
08.401.425	Meetings, Seminars & Conferences	$334.00
08.401.46C	Continuing Education Training	$0.00
08.401.53C	Subsidy to Fund 01 Wages	$47,233.00
08.401.75C	Capital - Manager vehicle (20K spread)	$5,000.00
	TOTAL EXECUTIVE	$54,449.00
08.402.21C	Office Supplies	$1,000.00
08.402.211	Copier Usage Shared cost	$300.00
08.402.241	General Government Supplies	$10.00
08.402.26C	Small Tools & Minor Equip	$10.00
08.402.31C	Professional Srvc - Portnoff	$20,000.00
08.402.311	Accounting & Auditing Sve	$13,425.00
08.402.321	Tele Monthly Charges	$1,400.00
08.402.325	Postage	$8,000.00
08.402.341	Advertising	$100.00
08.402.342	Printing/Copying & Forms	$2,500.00
08.402.353	Surety Bond - Treasurer	$300.00
08.402.374	Repairs -Machinery and Equipment	$750.00
08.402.39C	Bank Charges	$20,000.00
08.402.42C	Dues, Subscriptions & Member	$200.00
08.402.425	Meetings, Seminars & Conferences	$900.00
08.402.46C	Continuing Education	$25.00
08.402.461	Departmental Training Expense	$400.00
08.402.53C	Subsidy to Fund 01 Wages	$123,832.00

	TOTAL FINANCE	$193,152.00
08.404.314	Legal - Authority Solicitor	$15,000.00
08.404.315	Legal - Boro Solicitor shared costs	$15,000.00
08.404.317	Legal for AFSCME	$2,000.00
	TOTAL LEGAL	$32,000.00
08.406.210	Office Supplies	$200.00
08.406.211	Copier Shared Usage Costs	$125.00
08.406.241	General Government Supplies	$250.00
08.406.260	Small Tools & Minor Equip	$125.00
08.406.310	Professional Services	$438.00
08.406.321	Tele Monthly Charges	$200.00
08.406.325	Postage	$170.00
08.406.341	Advertising - all HR/employment	$1,125.00
08.406.342	Printing/Copying	$120.00
08.406.374	Repairs -Machinery and Equipment	$125.00
08.406.420	Dues, Subscriptions & Member	$75.00
08.406.425	Meetings, Seminars & Conferences	$250.00
08.406.460	Continuing Education	$165.00
08.406.471	Human Resources Initiative	$2,700.00
08.406.472	Employee Assistance Program	$450.00
08.406.530	Subsidy to Fund 01 Wages	$33,274.00
	TOTAL HR	$39,792.00
08.407.312	Image Net Scanning - DOC Star	$3,700.00
08.407.452	Comp Systems - Ridge Tech.	$34,000.00
08.407.453	Computer Services - Dallas Data	$25,000.00
08.407.530	Subsidy to Fund 01 Wages	$670.00
	TOTAL TECHNOLOGY	$63,370.00
08.408.313	Engineering - General -BCM	$25,000.00
08.408.319	Storm water Mgmt NPDES & MS-4	$10,000.00
	TOTAL ENGINEERING	$35,000.00
08.409.236	Building & Cleaning Supplies	$1,800.00
08.409.237	Building Paper Supplies	$500.00
08.409.261	Shredding Services	$300.00
08.409.262	Other Bldg. Supplies/Services	$500.00
08.409.309	Cleaning -Boro Hall (no police areas)	$4,050.00
08.409.321	Telephone (2011 had one-time pager pay-off)	$300.00
08.409.361	Electric - Boro Hall - portion	$7,000.00
08.409.362	Gas - Bldg Heating Fuel	$1,720.00
08.409.373	Building -Maint.Contracts (no janitorial)	$4,500.00
08.409.381	Rent of Land - Norfolk Southern	$550.00
	TOTAL BUILDING	$21,220.00

Borough of Pottstown
2013 Budget
Sewer Fund and Sewer Lines

08.429.110	Sewer Plant Wages	$682,427.00
08.429.179	Longevity	$3,900.00
08.429.180	Overtime	$40,000.00
08.429.184	Employee Wellness Prog. -Sick Days	$1,500.00
08.429.187	Shift Differential	$6,750.00
08.429.192	FICA	$56,195.00
08.429.210	Office Supplies & Forms	$5,000.00
08.429.222	Chemicals	$340,000.00
08.429.225	Lab Tests and Supplies	$70,000.00
08.429.231	Vehicle Fuel-Gasoline	$10,500.00
08.429.236	Building Supplies	$5,000.00
08.429.238	Clothing and Uniforms	$7,500.00
08.429.239	Grounds - Supplies & Matl	$5,000.00
08.429.241	Gen Misc Operating Expense	$7,500.00
08.429.251	Vehicle Parts and Maintenance	$2,000.00
08.429.260	Small Tools & Minor Equip	$10,000.00
08.429.265	Computers Maintenance	$15,000.00
08.429.268	Calibration of Plant Equipment	$2,500.00
08.429.321	Tele Monthly Charges	$5,000.00
08.429.324	Comcast Internet Connection	$1,440.00
08.429.325	Postage	$3,000.00
08.429.341	Advertising	$2,000.00
08.429.342	Printing/Binding-Forms	$1,500.00
08.429.360	Electric - Consulting Services	$0.00
08.429.361	Electric Plant	$520,000.00
08.429.362	Natural Gas for plant operation	$378,000.00
08.429.363	Electric - Pump Stations	$41,500.00
08.429.364	Sewer -Porter Road Pu.Sta. Cost	$23,000.00
08.429.365	Sludge Disposal Bio & Screening	$440,000.00
08.429.366	Water	$35,000.00
08.429.371	Ground Maintenance & Equip	$20,000.00
08.429.373	Building -Maint. & Contracts	$40,000.00
08.429.374	Maintenance- Plant Equipment	$450,000.00
08.429.384	Rent of Equipment	$3,000.00
08.429.410	Fines, Judgments & Damages	$20,000.00
08.429.420	Dues, Subscriptions & Member	$3,500.00
08.429.425	Meetings, Seminars & Conferences	$10,000.00
08.429.460	Continuing Education -Contractual	$4,000.00
08.429.530	Subsidy to Fund 06 - (1/2 Brent)	$38,334.00
08.429.740	Capital Purchases - Major	$25,000.00
08.429.750	Capital Purchases - Minor	$0.00
	TOTAL PLANT	$3,335,046.00
08.430.210	Office Supplies	$25.00
08.430.211	Copier Shared Usage Costs	$35.00
08.430.238	Clothing and Uniforms	$50.00
08.430.321	Tele Monthly Charges	$850.00

08.430.325	Postage	$100.00
08.430.341	Advertising	$150.00
08.430.353	Surety Bond - Highway Restoration	$50.00
08.430.374	Repairs to Garage Mach/Equip	$50.00
08.430.420	Dues, Subscriptions & Member	$50.00
08.430.425	Meetings, Seminars & Conferences.	$50.00
08.430.460	Continuing Education	$100.00
08.430.530	Subsidy to Fund 01 Wages	$1,379.00
	TOTAL PUBLIC WORKS	$2,889.00
08.471.100	Bond Administrative Fees	$10,000.00
08.471.300	1991 Sewer Revenue Bonds	$995,000.00
08.471.320	2005 Sewer Revenue Bonds	$0.00
08.471.330	2006 Sewer Revenue Bonds	$1,659,331.00
08.471.350	2012 Sewer Bonds	$410,000.00
	TOTAL DEBT SERVICE	$3,074,331.00
08.473.811	Depreciation Expense	$0.00
	TOTAL DEPRECIATION	$0.00
08.480.100	Miscellaneous Expense	$100.00
08.480.400	Bad Debt Expense	$2,500.00
	TOTAL MISC.	$2,600.00
08.486.001	Insur. Claims Exp. & Deduct.-	$2,500.00
08.486.100	Insurance - Liability	$15,000.00
08.486.200	Insurance - Property	$16,100.00
08.486.300	Insurance - Vehicles	$3,900.00
08.486.600	Insurance - Errors & Omissions	$9,000.00
08.486.800	Insurance - Flood	$1,000.00
	TOTAL PROPERTY INSUR.	$47,500.00
08.487.194	Unemployment Compensation	$1,000.00
08.487.195	Workers Compensation	$33,000.00
08.487.196	Health/Hospitalization Ins	$240,890.00
08.487.198	Non-Uniformed Life/AD&D	$6,100.00
	TOTAL EMP. BENEFITS	$280,990.00
08.488.195	Indirect Workers Comp	$12,000.00
08.488.196	Indirect Health Insurance	$76,300.00
08.488.198	Indirect Non-Uniformed Life/AD&D	$1,900.00
	TOTAL INDIRECT	$90,200.00
08.492.017	Transfer to Sewer Capital Fund	$0.00
08.492.018	Transfer to Sewer Line Fund	$510,000.00
	TOTAL TRANSFERS	$510,000.00

08.495.10C	Refunds of current Revenues	$100.00
	TOTAL REFUNDS	$100.00
08.499.10C	Transfer to Reserves	$323,410.00
	TOTAL TRANSFERS	$323,410.00
	grand total of Fund 08 expenses	$8,116,184.00
	grand total of Fund 08 revenues	-$8,116,184.00
	Overage or (Shortage)	0

18 SEWER LINES FUND

18.341.10C	Interest Earnings	-$1,200.00
	TOTAL INTEREST	-$1,200.00
18.389.30C	Sale of Scrap Metal	-$500.00
	TOTAL SALES	-$500.00
18.392.008	Due from Sewer Operating 08	-$510,000.00
	TOTAL INTERFUND TRSFRS	-$510,000.00
18.395.20C	Refund Prior Year Expense	-$1.00
	TOTAL REFUNDS	-$1.00
18.399.10C	Bal. forward from reserves	-$13,426.00
	TOTAL BALANCE FORWARDED	-$13,426.00
	TOTAL SEWER LINE 18 REV	-$525,127.00
18.402.311	Acct. & Auditing	$900.00
	TOTAL FINANCE	$900.00
18.407.452	Comp Systems -Comcast & Ridge	$1,500.00
18.407.453	Computer Services - Dallas Data	$1,000.00
18.407.53C	Subsidy to Fund 01 Wages	$481.00
	TOTAL COMPUTERS	$2,981.00
18.408.313	Engineering - Sewer Lines	$1.00
	TOTAL ENGINEERING	$1.00
18.409.361	Electricity - Boro Hall	$16,200.00
18.409.362	Gas - Bldg Heating Fuel	$5,300.00
	TOTAL BUILDING	$21,500.00
18.430.21C	Office Supplies	$0.00
18.430.211	Copier Usage Shared Costs	$0.00

18.430.241	General Misc Operating Exp.	$125.00
18.430.325	Postage	$125.00
18.430.327	Radio Maintenance	$150.00
18.430.341	Advertising	$300.00
18.430.342	Printing/Binding	$100.00
18.430.373	Buildings - Garage repairs	$200.00
18.430.374	Repairs -Machinery/Equipment	$200.00
18.430.42C	Dues, Subscriptions & Member	$150.00
18.430.425	Meetings, Seminars, Conferences	$750.00
18.430.53C	Subsidy to Fund 01 wages	$45,677.00
	TOTAL PUBLIC WORKS	$47,777.00
18.436.11C	Public Works Wages (3 staff)	$149,531.00
18.436.18C	Overtime	$10,000.00
18.436.184	Employee Wellness Program	$300.00
18.436.192	FICA	$12,227.00
18.436.21C	Office Supplies	$200.00
18.436.231	Vehicle Gas & Oil	$3,200.00
18.436.236	Supplies & Material	$400.00
18.436.238	Clothing and Uniforms	$1,000.00
18.436.251	Vehicle Maintenance	$6,000.00
18.436.321	Telephones	$400.00
18.436.361	Electric - Flow Meters & East End Alarm	$500.00
18.436.374	Machinery and Equipment Maint	$100.00
18.436.375	Maint & Repairs Sewer Lines -7	$145,000.00
18.436.376	Maint of Meters - 7	$4,000.00
18.436.42C	Dues, Subscriptions & Member	$100.00
18.436.425	Meetings & Conference	$300.00
18.436.46C	Continuing Ed - Contractual	$400.00
18.436.75C	Capital Purchase - Minor	$0.00
	TOTAL SEWER LINES	$333,658.00
18.480.10C	Misc. Expense	$10.00
	TOTAL MISC. EXP	$10.00
18.486.001	Insurance - Claim Deductible Exp.	$500.00
18.486.10C	Insurance - Liability	$6,000.00
18.486.20C	Insurance - Property	$6,500.00
18.486.60C	Insurance - Public Liability	$3,600.00
	TOTAL INSURANCE	$16,600.00
18.487.194	Unemployment Compensation	$100.00
18.487.195	Workers' Compensation	$7,000.00
18.487.196	Health/Hospitalization Ins	$49,050.00
18.487.198	Non-Uniformed Life AD&D	$1,200.00
	TOTAL EMP INSURANCES -18	$57,350.00

18.488.195	Indirect Workers' Compensation	$6,000.00
18.488.196	Indirect Health Insurance	$38,150.00
18.488.198	Indirect Non-Uniformed Life AD&D	$200.00
	TOTAL Shared EMP BENF -18	$44,350.00
18.492.017	Transfer to Fund 17	$0.00
	TOTAL INTERFUND TRANSFERS	$0.00
18.499.100	Transfer to Reserves	$0.00
	TOTAL TRSF TO RESERVE	$0.00
	Total of Fund 18 expenses	$525,127.00
	Total of Fund 18 revenues	-$525,127.00
	Overage or (Shortage)	$0.00

Appendix J

BOROUGH OF POTTSTOWN
BALANCE SHEET
DECEMBER 31, 2013
13/13

SEWER OPERATING FUND 08

ASSETS

08.100000	CASH - SUSQ -#2379		5,783,049.77	
08.145000	ACCTS RECEIVABLE (NOT UTILITY)		88,660.22	
08.145100	UTILITY SEWER RECEIVABLES		1,402,485.51	
08.145110	ACCOUNTS REC.-BUSINESS LICENSE		20,055.87	
08.145510	ALLOW.- UNCOLL ACCTS RECEIV.		(186,909.44)	
08.145706	UPPER POTTSG SEWER RECEIVABLES		147,096.37	
08.145707	WEST POTTSGR SEWER RECEIVABLES		47,949.80	
08.155000	PREPAID ITEMS		23,097.50	
08.162500	SEWER PLANT - ACCUM DEPRECIAT.		(5,353,343.00)	
08.164000	SEWER PLANT - MACH. & EQUIP.		6,211,962.01	
	TOTAL ASSETS			8,184,104.61

LIABILITIES AND EQUITY

LIABILITIES

08.200210	ACCT PAY -ACCRUALS NEW YEAR		225,850.39	
08.235200	DUE TO UPPER POTTSGROVE		315,528.14	
08.235300	DUE TO WEST POTTSGROVE		146,468.60	
08.235400	DUE TO LOWER POTTSGROVE		60,247.00	
08.246000	COMPENSATED BALANCES		55,372.00	
	TOTAL LIABILITIES			803,466.13

FUND EQUITY

08.279990	UNRESERVED FUND BALANCE		6,660,562.32	
	UNAPPROPRIATED FUND BALANCE:			
	REVENUE OVER EXPENDITURES - YTD	720,076.16		
	BALANCE - CURRENT DATE		720,076.16	
	TOTAL FUND EQUITY			7,380,638.48
	TOTAL LIABILITIES AND EQUITY			8,184,104.61

BOROUGH OF POTTSTOWN
BALANCE SHEET
DECEMBER 31, 2013
13/13

SEWER LINES FUND 18

	ASSETS			
18.100000	CASH - SUSQ -#2379		146,163.50	
18.155000	PREPAID ITEMS		8,760.00	
	TOTAL ASSETS			154,923.50
	LIABILITIES AND EQUITY			
	LIABILITIES			
18.200210	ACCT PAY -ACCRUALS NEW YEAR		73,457.89	
18.246000	COMPENSATED BALANCES		8,143.00	
	TOTAL LIABILITIES			81,600.89
	FUND EQUITY			
18.279990	UNRESERVED FUND BALANCE		16,372.07	
	UNAPPROPRIATED FUND BALANCE:			
	REVENUE OVER EXPENDITURES - YTD	56,950.54		
	BALANCE - CURRENT DATE		56,950.54	
	TOTAL FUND EQUITY			73,322.61
	TOTAL LIABILITIES AND EQUITY			154,923.50

BOROUGH OF POTTSTOWN
COMBINED CASH INVESTMENT
DECEMBER 31, 2013
13/13

COMBINED CASH ACCOUNTS

CASH ALLOCATION RECONCILIATION

8	ALLOCATION TO SEWER OPERATING FUND 08	5,783,049.77
17	ALLOCATION TO SEWER CAPITAL FUND 17	1,844,733.16
18	ALLOCATION TO SEWER LINES FUND 18	146,163.50
	TOTAL ALLOCATIONS TO OTHER FUNDS	7,773,946.43
	ZERO PROOF IF ALLOCATIONS BALANCE	7,773,946.43

BOROUGH OF POTTSTOWN
REVENUES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEARNED	PRC
	INTEREST EARNINGS					
08.341.100	INTEREST EARNINGS	12,000.00	6,116.66	6,116.66	5,883.34	51
	TOTAL INTEREST EARNINGS	12,000.00	6,116.66	6,116.66	5,883.34	51
	STATE & LOCAL GOV'T GRANTS					
08.357.020	PA EMERG. MGMT GRANTS	.00	44,022.36	44,022.36	(44,022.36)	0
	TOTAL STATE & LOCAL GOV'T GRANTS	.00	44,022.36	44,022.36	(44,022.36)	0
	SEWER					
08.364.010	EDU SEWER USAGE FEES	5,200,000.00	5,416,430.72	5,416,430.72	(216,430.72)	104
08.364.100	SEWER TAPPING FEE	45,000.00	66,435.00	66,435.00	(21,435.00)	148
08.364.101	SEWER CONNECT APPL. FEES	8,500.00	8,990.00	8,990.00	(490.00)	106
08.364.104	SEWER CONNECT PERMIT	100.00	.00	.00	100.00	0
08.364.105	VIOLATIONS, INSPECTS & PERMITS	9,000.00	11,420.00	11,420.00	(2,420.00)	127
08.364.110	PENALTIES & INTEREST (UTILITY)	100,000.00	100,435.30	100,435.30	(435.30)	100
08.364.120	BULK SEWER COLLECTIONS	1,750,000.00	2,021,804.39	2,021,804.39	(271,804.39)	116
08.364.130	WASTE MGMT LEACHATE	150,000.00	91,114.12	91,114.12	58,885.88	61
08.364.140	MIPP - LAB ANALYTICAL	5,000.00	11,820.86	11,820.86	(6,820.86)	236
08.364.141	MIPP -CONCENTRATION SURCHARGE	.00	60.00	60.00	(60.00)	0
08.364.600	LOWER POTTSGROVE O & M PAYMENT	411,613.00	351,364.00	351,364.00	60,249.00	85
08.364.601	UPPER POTTSGROVE O & M PAYMENT	154,510.00	102,347.00	102,347.00	52,163.00	66
08.364.602	WEST POTTSGROVE O & M PAYMENT	211,747.00	200,666.00	200,666.00	11,081.00	95
	TOTAL SEWER	8,045,470.00	8,382,887.39	8,382,887.39	(337,417.39)	104
	MISCELLANEOUS INCOME					
08.380.100	MISCELLANEOUS	25.00	6,579.00	6,579.00	(6,554.00)	2631
	TOTAL MISCELLANEOUS INCOME	25.00	6,579.00	6,579.00	(6,554.00)	2631
	UNCLASSIFIED OPERATING REVENUE					
08.389.010	BID DOCUMENT SALES FEES	10.00	.00	.00	10.00	0
08.389.100	UTILITY SEWER CERTIFICATIONFEE	9,000.00	12,135.00	12,135.00	(3,135.00)	135
08.389.106	REFUND WAGE ALLOCTION FUND 06	38,479.00	40,371.00	40,371.00	(1,892.00)	105
08.389.200	ENERGY CAPACITY PYMNTS	10,000.00	2,844.69	2,844.69	7,155.31	28
08.389.300	SALE OF SCRAP METAL	1,000.00	1,689.32	1,689.32	(689.32)	169
	TOTAL UNCLASSIFIED OPERATING REVENUE	58,489.00	57,040.01	57,040.01	1,448.99	98

BOROUGH OF POTTSTOWN
REVENUES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEARNED	PRC
	REFUNDS OF EXPENSES					
08.395.100	REFUND - CURRENT YEAR EXPENSES	100.00	10,206.98	10,206.98	(10,106.98)	1020
08.395.200	REFUND - PRIOR YEAR EXPENSES	100.00	.00	.00	100.00	0
08.395.400	REFUND - ACC/LIAB. CLAIM PYMNT	.00	13,449.89	13,449.89	(13,449.89)	0
	TOTAL REFUNDS OF EXPENSES	200.00	23,656.87	23,656.87	(23,456.87)	1182
	TOTAL FUND REVENUE	8,116,184.00	8,520,302.29	8,520,302.29	(404,118.29)	105

BOROUGH OF POTTSTOWN
REVENUES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER LINES FUND 18

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEARNED	PRC
	INTEREST EARNINGS					
18.341.100	INTEREST EARNINGS	1,200.00	275.84	275.84	924.16	23
	TOTAL INTEREST EARNINGS	1,200.00	275.84	275.84	924.16	23
	UNCLASSIFIED OPERATING REVENUE					
18.389.300	SALE OF SCRAP METAL	300.00	810.00	810.00	(510.00)	270
	TOTAL UNCLASSIFIED OPERATING REVENUE	300.00	810.00	810.00	(510.00)	270
	INTERFUND OPERATING TRSFS					
18.392.008	TRANSFER FROM SEWER FUND 08	510,000.00	510,000.00	510,000.00	.00	100
	TOTAL INTERFUND OPERATING TRSFS	510,000.00	510,000.00	510,000.00	.00	100
	REFUNDS OF EXPENSES					
18.395.200	REFUND - PRIOR YEAR EXPENSES	1.00	.00	.00	1.00	0
	TOTAL REFUNDS OF EXPENSES	1.00	.00	.00	1.00	0
	RESERVES					
18.399.100	BALANCE FORWARD FR RESERVES	13,626.00	.00	.00	13,626.00	0
	TOTAL RESERVES	13,626.00	.00	.00	13,626.00	0
	TOTAL FUND REVENUE	525,127.00	511,085.84	511,085.84	14,041.16	97

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	LEGISLATION - COUNCIL					
08.400.210	OFFICE SUPPLIES	400.00	304.79	304.79	95.21	76
08.400.241	GENERAL GOVERNMENTAL SUPPLIES	100.00	216.51	216.51	(116.51)	217
08.400.341	ADVERTISING	2,664.00	3,517.33	3,517.33	(853.33)	132
08.400.342	PRINTING/BINDING	167.00	217.51	217.51	(50.51)	130
08.400.420	DUES, SUBSCRIPTS, MEMBERSHIPS	3,180.00	2,685.25	2,685.25	494.75	84
08.400.425	MEETING, SEMINAR, CONFERENCES	502.00	1,229.40	1,229.40	(727.40)	245
08.400.530	SUBSIDY TO FUND 01- 400,01,02	3,122.00	3,122.00	3,122.00	.00	100
	TOTAL LEGISLATION - COUNCIL	10,135.00	11,292.79	11,292.79	(1,157.79)	111
	EXECUTIVE - MGR					
08.401.210	OFFICE SUPPLIES	630.00	1,554.30	1,554.30	(924.30)	247
08.401.211	COPIER USAGE SHARED COSTS	152.00	152.88	152.88	(.88)	101
08.401.231	VEHICLE FUEL - GASOLINE	200.00	143.98	143.98	56.02	72
08.401.241	GENERAL GOVERNMENTAL SUPPLIES	50.00	69.25	69.25	(19.25)	139
08.401.251	VEHICLE PARTS & REPAIRS	17.00	.00	.00	17.00	0
08.401.321	TELEPHONE	306.00	461.07	461.07	(155.07)	151
08.401.325	POSTAGE	101.00	101.54	101.54	(.54)	101
08.401.341	ADVERTISING	42.00	.00	.00	42.00	0
08.401.342	PRINTING/BINDING	117.00	62.62	62.62	54.38	54
08.401.353	SURETY BOND - MANAGER	.00	612.50	612.50	(612.50)	0
08.401.374	REPAIRS - MACH. & EQUIPMENT	.00	28.38	28.38	(28.38)	0
08.401.420	DUES, SUBSCRIPTS, MEMBERSHIPS	267.00	230.61	230.61	36.39	86
08.401.425	MEETING, SEMINAR, CONFERENCES	334.00	705.30	705.30	(371.30)	211
08.401.530	SUBSIDY TO FUND 01 - WAGES	47,233.00	47,233.00	47,233.00	.00	100
08.401.740	CAPITAL PURCHASES - MAJOR	7,711.00	.00	.00	7,711.00	0
	TOTAL EXECUTIVE - MGR	57,160.00	51,355.43	51,355.43	5,804.57	90

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	FINANCE					
08.402.210	OFFICE SUPPLIES	2,000.00	2,199.65	2,199.65	(199.65)	110
08.402.211	COPIER USAGE SHARED COSTS	300.00	305.76	305.76	(5.76)	102
08.402.241	GENERAL GOVERNMENTAL SUPPLIES	10.00	1,526.11	1,526.11	(1,516.11)	1526
08.402.260	SMALL TOOLS/MINOR EQUIPMENT	10.00	.00	.00	10.00	0
08.402.310	PROFESSIONAL SRVCS-COLLECTIONS	20,000.00	19,567.72	19,567.72	432.28	98
08.402.311	ACCOUNTING & AUDIT SERVICES	12,325.00	5,050.00	5,050.00	7,275.00	41
08.402.321	TELEPHONE	1,400.00	1,046.55	1,046.55	353.45	75
08.402.325	POSTAGE	8,000.00	10,763.60	10,763.60	(2,763.60)	135
08.402.341	ADVERTISING	100.00	.00	.00	100.00	0
08.402.342	PRINTING/BINDING -FORMS	2,500.00	1,559.92	1,559.92	940.08	62
08.402.353	SURETY BOND - TREASURER	400.00	356.50	356.50	43.50	89
08.402.374	REPAIRS - MACH. & EQUIPMENT	750.00	419.28	419.28	330.72	56
08.402.390	BANK CHARGES	20,000.00	18,863.20	18,863.20	1,136.80	94
08.402.420	DUES, SUBSCRIPTS, MEMBERSHIPS	200.00	121.55	121.55	78.45	61
08.402.425	MEETING, SEMINAR, CONFERENCES	900.00	467.32	467.32	432.68	52
08.402.460	CONTINUING ED - CONTRACTUAL	25.00	.00	.00	25.00	0
08.402.461	DEPARTMENTAL TRAINING EXPENSE	400.00	125.00	125.00	275.00	31
08.402.530	SUBSIDY TO FUND 01 - WAGES	123,832.00	128,832.00	128,832.00	(5,000.00)	104
	TOTAL FINANCE	193,152.00	191,204.16	191,204.16	1,947.84	99
	LEGAL					
08.404.314	LEGAL - GENERAL EXPENSES-BORO	15,000.00	4,860.35	4,860.35	10,139.65	32
08.404.315	LEGAL - GENERAL EXP.-AUTHORITY	15,000.00	12,665.36	12,665.36	2,334.64	84
08.404.317	LEGAL - AFSCME UNION EXPENSES	2,000.00	12,985.89	12,985.89	(10,985.89)	649
	TOTAL LEGAL	32,000.00	30,511.60	30,511.60	1,488.40	95

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	HUMAN RESOURCES					
08.406.210	OFFICE SUPPLIES	200.00	41.87	41.87	158.13	21
08.406.211	COPIER USAGE SHARED COSTS	125.00	114.40	114.40	10.60	92
08.406.241	GENERAL GOVERNMENTAL SUPPLIES	250.00	179.19	179.19	70.81	72
08.406.260	SMALL TOOLS/MINOR EQUIPMENT	125.00	124.50	124.50	.50	100
08.406.310	PROFESSIONAL SRVCS-CONSULTANTS	438.00	.00	.00	438.00	0
08.406.321	TELEPHONE	200.00	124.22	124.22	75.78	62
08.406.325	POSTAGE	170.00	17.34	17.34	152.66	10
08.406.341	ADVERTISING	1,125.00	513.11	513.11	611.89	46
08.406.342	PRINTING/BINDING	120.00	.00	.00	120.00	0
08.406.374	REPAIRS - MACH. & EQUIPMENT	125.00	.00	.00	125.00	0
08.406.420	DUES, SUBSCRIPTS, MEMBERSHIPS	75.00	94.36	94.36	(19.36)	126
08.406.425	MEETING, SEMINAR, CONFERENCES	250.00	23.27	23.27	226.73	9
08.406.460	CONTINUING ED - CONTRACTUAL	165.00	.00	.00	165.00	0
08.406.471	HUMAN RESOURCES INITIATIVE	2,700.00	1,274.89	1,274.89	1,425.11	47
08.406.472	EMPLOYEE ASSISTANCE PROGRAM	450.00	296.55	296.55	153.45	66
08.406.473	SAFETY TRAINING EXPENSES	600.00	.00	.00	600.00	0
08.406.530	SUBSIDY TO FUND 01 - WAGES	33,274.00	33,274.00	33,274.00	.00	100
	TOTAL HUMAN RESOURCES	40,392.00	36,077.70	36,077.70	4,314.30	89
	IT - WEB NETWORK SRVCS					
08.407.312	IMAGE NET SCANNING - DOC STAR	3,700.00	2,410.67	2,410.67	1,289.33	65
08.407.452	COMP. SYSTEMS-COMCAST & RIDGE	34,000.00	30,598.71	30,598.71	3,401.29	90
08.407.453	COMPUTER SERVICS -DALLAS DATA	25,000.00	24,252.74	24,252.74	747.26	97
08.407.530	SUBSIDY TO FUND 01 - WAGES	670.00	670.00	670.00	.00	100
	TOTAL IT - WEB NETWORK SRVCS	63,370.00	57,932.12	57,932.12	5,437.88	91
	ENGINEERING					
08.408.313	ENGINEERING - GENERAL SEWER	51,000.00	95,552.65	95,552.65	(44,552.65)	187
08.408.319	STORM WATER MGMT NPDES & MS 4	7,289.00	1,478.76	1,478.76	5,810.24	20
	TOTAL ENGINEERING	58,289.00	97,031.41	97,031.41	(38,742.41)	166

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	GENERAL GOV'T BUILDING					
08.409.236	BUILDING & CLEANING SUPPLIES	1,800.00	805.34	805.34	994.66	45
08.409.237	BUILDING PAPER SUPPLIES	900.00	2,266.00	2,266.00	(1,366.00)	252
08.409.261	SHREDDING SERVICES	300.00	390.07	390.07	(90.07)	130
08.409.262	OTHER BLDG SUPPLIES/ SERVICES	700.00	3,483.15	3,483.15	(2,783.15)	498
08.409.309	PROFESSIONAL CLEANING SERVICES	4,050.00	3,696.87	3,696.87	353.13	91
08.409.321	TELEPHONE	300.00	527.70	527.70	(227.70)	176
08.409.324	COMCAST -INTERNET BACK-UP	50.00	6.21	6.21	43.79	12
08.409.361	ELECTRIC -PART OF BORO BLDG	7,000.00	6,239.68	6,239.68	760.32	89
08.409.362	GAS - BLDG HEATING FUEL	2,920.00	1,599.38	1,599.38	1,320.62	55
08.409.373	BUILDING MAINT & CONTRACTS	6,500.00	14,626.10	14,626.10	(8,126.10)	225
08.409.381	RENT OF LAND -NORFOLK SOUTHERN	550.00	590.37	590.37	(40.37)	107
	TOTAL GENERAL GOV'T BUILDING	25,070.00	34,230.87	34,230.87	(9,160.87)	137

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	WASTE WATER TREATMENT					
08.429.110	SEWER PLANT WAGES	686,213.00	708,802.35	708,802.35	(22,589.35)	103
08.429.179	LONGEVITY	3,900.00	3,900.00	3,900.00	.00	100
08.429.180	OVERTIME	40,000.00	38,735.66	38,735.66	1,264.34	97
08.429.184	EMPLOYEE WELLNESS PROGRAM	1,500.00	2,500.00	2,500.00	(1,000.00)	167
08.429.187	SHIFT DIFFERENTIAL	6,750.00	4,265.26	4,265.26	2,484.74	63
08.429.192	FICA TAX	56,485.00	55,739.63	55,739.63	745.37	99
08.429.210	OFFICE SUPPLIES	5,000.00	4,606.47	4,606.47	393.53	92
08.429.222	CHEMICALS	340,000.00	278,980.38	278,980.38	61,019.62	82
08.429.225	LABORATORY SUPPLIES/TESTS	70,000.00	80,467.05	80,467.05	(10,467.05)	115
08.429.231	VEHICLE FUEL - GASOLINE	10,500.00	4,058.40	4,058.40	6,441.60	39
08.429.232	OFF ROAD/VEHICLE FUEL - DIESEL	.00	1,860.78	1,860.78	(1,860.78)	0
08.429.236	BUILDING & CLEANING SUPPLIES	5,000.00	2,265.32	2,265.32	2,734.68	45
08.429.238	CLOTHING/UNIFORMS	7,500.00	5,048.37	5,048.37	2,451.63	67
08.429.239	GROUNDS - SUPPLIES & MATERIALS	5,000.00	1,428.92	1,428.92	3,571.08	29
08.429.241	GENERAL GOVERNMENTAL SUPPLIES	7,500.00	14,402.19	14,402.19	(6,902.19)	192
08.429.251	VEHICLE PARTS & REPAIRS	2,000.00	1,167.50	1,167.50	832.50	58
08.429.260	SMALL TOOLS/MINOR EQUIPMENT	10,000.00	8,510.88	8,510.88	1,489.12	85
08.429.265	COMPUTER MAINTENANCE	15,000.00	4,395.64	4,395.64	10,604.36	29
08.429.268	EQUIPMENT CALIBRATION EXPENSES	2,500.00	2,180.12	2,180.12	319.88	87
08.429.321	TELEPHONE	5,000.00	8,411.10	8,411.10	(3,411.10)	168
08.429.324	COMCAST	1,440.00	719.40	719.40	720.60	50
08.429.325	POSTAGE	3,000.00	2,233.64	2,233.64	766.36	74
08.429.341	ADVERTISING	2,000.00	1,014.77	1,014.77	985.23	51
08.429.342	PRINTING/BINDING -FORMS	1,500.00	827.00	827.00	673.00	55
08.429.361	ELECTRIC - SEWER PLANT	520,000.00	459,771.42	459,771.42	60,228.58	88
08.429.362	NATURAL GAS - PLANT OPERATIONS	378,000.00	307,922.11	307,922.11	70,077.89	81
08.429.363	ELECTRIC - PUMP STATIONS	41,500.00	25,431.30	25,431.30	16,068.70	61
08.429.364	PORTER RD PUSTAT SHARED COSTS	23,000.00	18,546.83	18,546.83	4,453.17	81
08.429.365	SLUDGE DISPOSAL -BIO & SCREEN	378,200.00	168,867.22	168,867.22	209,332.78	45
08.429.366	WATER - METERED USAGE	35,000.00	24,264.72	24,264.72	10,735.28	69
08.429.371	GROUNDS - MAINTENANCE & EQUIP.	20,000.00	33,802.10	33,802.10	(13,802.10)	169
08.429.373	BUILDING MAINT & CONTRACTS	55,000.00	55,248.25	55,248.25	(248.25)	100
08.429.374	REPAIRS - MACH. & EQUIPMENT	450,000.00	549,125.93	549,125.93	(99,125.93)	122
08.429.384	EQUIPMENT RENTAL EXPENSE	3,000.00	.00	.00	3,000.00	0
08.429.410	DEP FINES, JUDGMNTS, DAMAGES	20,000.00	9,669.00	9,669.00	10,331.00	48
08.429.420	DUES, SUBSCRIPTS, MEMBERSHIPS	3,500.00	1,135.28	1,135.28	2,364.72	32
08.429.425	MEETING, SEMINAR, CONFERENCES	10,000.00	5,878.40	5,878.40	4,121.60	59
08.429.460	CONTINUING ED - CONTRACTUAL	4,000.00	150.00	150.00	3,850.00	4
08.429.530	SUBSIDY TO FUND 06 - WAGES	40,371.00	40,371.00	40,371.00	.00	100
08.429.740	CAPITAL PURCHASES - MAJOR	35,000.00	.00	.00	35,000.00	0
08.429.750	CAPITAL PURCHASE -MINOR	.00	230.00	230.00	(230.00)	0
	TOTAL WASTE WATER TREATMENT	3,304,359.00	2,936,934.39	2,936,934.39	367,424.61	89

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	PUBLIC WORKS					
08.430.210	OFFICE SUPPLIES	25.00	233.94	233.94	(208.94)	936
08.430.211	COPIER USAGE SHARED COSTS	35.00	47.58	47.58	(12.58)	136
08.430.230	HEATING FUEL - GARAGE	.00	3,770.05	3,770.05	(3,770.05)	0
08.430.238	CLOTHING/UNIFORMS	50.00	.00	.00	50.00	0
08.430.241	GENERAL GOVERNMENTAL SUPPLIES	.00	83.83	83.83	(83.83)	0
08.430.321	TELEPHONE	850.00	608.19	608.19	241.81	72
08.430.325	POSTAGE	100.00	13.48	13.48	86.52	13
08.430.341	ADVERTISING	150.00	.00	.00	150.00	0
08.430.353	SURETY BOND - HIGHWAY RESTORAT	50.00	.00	.00	50.00	0
08.430.374	REPAIRS - MACH. & EQUIPMENT	50.00	.00	.00	50.00	0
08.430.420	DUES, SUBSCRIPTS, MEMBERSHIPS	50.00	.00	.00	50.00	0
08.430.425	MEETING, SEMINAR, CONFERENCES	50.00	.00	.00	50.00	0
08.430.460	CONTINUING ED - CONTRACTUAL	100.00	.00	.00	100.00	0
08.430.530	SUBSIDY TO FUND 01 - WAGES	1,379.00	1,379.00	1,379.00	.00	100
	TOTAL PUBLIC WORKS	2,889.00	6,136.07	6,136.07	(3,247.07)	212
	DEBT SERVICE					
08.471.100	BOND ADMINISTRATIVE FEES	10,000.00	7,155.00	7,155.00	2,845.00	72
08.471.300	1991 SEWER REVENUE BONDS	995,000.00	995,000.00	995,000.00	.00	100
08.471.330	2006 SEWER REVENUE BONDS	1,659,331.00	1,489,021.64	1,489,021.64	170,309.36	90
08.471.350	2012 SEWER BONDS	410,000.00	405,807.35	405,807.35	4,192.65	99
	TOTAL DEBT SERVICE	3,074,331.00	2,896,983.99	2,896,983.99	177,347.01	94
	DEPARTMENT 473					
08.473.811	DEPRECIATION EXPENSE	.00	50,783.00	50,783.00	(50,783.00)	0
	TOTAL DEPARTMENT 473	.00	50,783.00	50,783.00	(50,783.00)	0
	MISCELLAENOUS					
08.480.100	MISCELLANEOUS EXPENSE	600.00	687.32	687.32	(87.32)	115
08.480.400	BAD DEBT EXPENSE	3,500.00	9,136.10	9,136.10	(5,636.10)	261
	TOTAL MISCELLAENOUS	4,100.00	9,823.42	9,823.42	(5,723.42)	240

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	INSURANCES					
08.486.001	INSUR. CLAIM EXP & DEDUCTIBLES	2,500.00	.00	.00	2,500.00	0
08.486.100	INSURANCE - LIABILITY	16,900.00	16,875.20	16,875.20	24.80	100
08.486.200	INSURANCE - PROPERTY	18,800.00	18,792.50	18,792.50	7.50	100
08.486.300	INSURANCE - VEHICLES	5,100.00	5,063.49	5,063.49	36.51	99
08.486.600	INSURANCE - ERRORS & OMISSIONS	12,000.00	12,598.57	12,598.57	(598.57)	105
08.486.800	INSURANCE - FLOOD	1,500.00	1,429.00	1,429.00	71.00	95
	TOTAL INSURANCES	56,800.00	54,758.76	54,758.76	2,041.24	96
	HEALTH & OTHER BENEFITS					
08.487.194	UNEMPLOYMENT COMPENSATION	1,000.00	6,821.95	6,821.95	(5,821.95)	682
08.487.195	WORKERS COMPENSATION	34,000.00	32,781.32	32,781.32	1,218.68	96
08.487.196	HEALTH/HOSPITALIZATION	240,890.00	197,836.65	197,836.65	43,053.35	82
08.487.198	NON-UNIF LIFE AD&D& MGMT DISAB	6,100.00	5,167.65	5,167.65	932.35	85
	TOTAL HEALTH & OTHER BENEFITS	281,990.00	242,607.57	242,607.57	39,382.43	86
	SHARED EMPLOYEE BENEFITS					
08.488.195	INDIRECT WORKERS COMPENSATION	12,200.00	11,652.85	11,652.85	547.15	96
08.488.196	INDIRECT HEALTH/HOSPITALIZTION	76,300.00	62,763.48	62,763.48	13,536.52	82
08.488.198	INDIRECT NON-UNIFORM LIFE AD&D	1,900.00	670.22	670.22	1,229.78	35
	TOTAL SHARED EMPLOYEE BENEFITS	90,400.00	75,086.55	75,086.55	15,313.45	83
	INTERFUND OPERT TRANSFERS					
08.492.001	TRANSFER TO GEN FUND 01	.00	7,710.90	7,710.90	(7,710.90)	0
08.492.017	TRSFR TO SEWER CAPITAL FUND 17	.00	500,000.00	500,000.00	(500,000.00)	0
08.492.018	TRSFR TO SEWER LINES FUND 18	510,000.00	510,000.00	510,000.00	.00	100
	TOTAL INTERFUND OPERT TRANSFERS	510,000.00	1,017,710.90	1,017,710.90	(507,710.90)	200
	REFUNDS					
08.495.100	REFUNDS OF REVENUES	500.00	(234.60)	(234.60)	734.60	(47)
	TOTAL REFUNDS	500.00	(234.60)	(234.60)	734.60	(47)
	RESERVES					
08.499.100	TRANSFER TO RESERVES	311,247.00	.00	.00	311,247.00	0
	TOTAL RESERVES	311,247.00	.00	.00	311,247.00	0

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER OPERATING FUND 08

	BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
TOTAL FUND EXPENDITURES	8,116,184.00	7,800,226.13	7,800,226.13	315,957.87	96
NET REVENUE OVER EXPENDITURES	.00	720,076.16	720,076.16	(720,076.16)	0

BOROUGH OF POTTSTOWN
BALANCE SHEET
DECEMBER 31, 2013
13/13

SEWER CAPITAL FUND 17

ASSETS

17.100000	CASH - SUSQ -#1991 (OWN ACCT)		1,844,733.16	
17.107100	BOND REDEMPTION FUND #910		96,607.56	
17.107201	ADMIN EXP. FUND #901		10,653.66	
17.107301	2006 BOND DEBT SRVC ACCT #322		1.00	
17.107400	SEWER CLEARNING FUND #466		.66	
17.107401	REBATE RESERVE FUND - #902		97,457.80	
17.120100	1991 BOND ESCROW ACCT #908		16,566,720.20	
17.120101	DEBT SERVICE RESERVE FUND #906		3,147,953.52	
17.120102	NAT'L PENN SWAPTION#0431		1,919,899.99	
17.155010	ACCRUAL ITEMS-CASH RECEIPTS		27,873.00	
17.161000	CAP. SEWER PROPERTY - LAND		36,650.00	
17.162000	CAP. SEWER PLANT IMPROVEMENTS		31,547,193.77	
17.162500	CAPITAL SEWER PLANT- ACC. DEP		(12,262,397.92)	
17.164000	CAP. SEWER PLANT -MACH & EQUIP		1,294,336.17	
17.164500	ACCM DEPREC -MACH & EQUIP		(659,002.49)	
17.165000	CAP. CONSTRUCTION IN PROGRESS		29,040.88	
17.166000	INFRASTRUCTURE		5,115,985.66	
17.166500	ACC. DEPRECIATI INFRASTRUCTURE		(1,936,274.70)	
17.170101	DEFERRED AMT FR REFUNDING 1996		721,220.00	
17.170105	2012 LOSS ON REFUNDING		74,489.00	
	TOTAL ASSETS			47,673,140.92

LIABILITIES AND EQUITY

LIABILITIES

17.245200	BOND ISSUE PREMIUM - 2006		264,185.00	
17.245201	BOND ISSUE PREMIUM - 2012		35,631.70	
17.246100	ACCRUED INTEREST FR INVESTMNTS		117,527.00	
17.255100	1991 SERIES BONDS		13,645,940.69	
17.255300	2006 SERIES BONDS		15,955,000.00	
17.255400	2012 SERIES BOND		4,075,000.00	
	TOTAL LIABILITIES			34,093,284.39

FUND EQUITY

17.279990	UNRESERVED FUND BALANCE		13,194,574.81	
	UNAPPROPRIATED FUND BALANCE:			
	REVENUE OVER EXPENDITURES - YTD	385,281.72		
	BALANCE - CURRENT DATE		385,281.72	
	TOTAL FUND EQUITY			13,579,856.53
	TOTAL LIABILITIES AND EQUITY			47,673,140.92

BOROUGH OF POTTSTOWN
REVENUES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER CAPITAL FUND 17

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEARNED	PRC
	TRUSTEE ACTIVITY					
17.340.100	OPERATING CONTRIBUTION TO DEBT	3,065,000.00	2,889,828.99	2,889,828.99	175,171.01	94
17.340.200	INVESTMENT ACCT EARNINGS	.00	148.95	148.95	(148.95)	0
17.340.300	UNREALIZED GAIN (LOSS)	.00	(1,188,183.23)	(1,188,183.23)	1,188,183.23	0
17.340.400	REALIZED GAIN (LOSS)	.00	839,828.04	839,828.04	(839,828.04)	0
	TOTAL TRUSTEE ACTIVITY	3,065,000.00	2,541,622.75	2,541,622.75	523,377.25	83
	INTEREST EARNINGS					
17.341.100	INTEREST EARNINGS	90,000.00	107,973.87	107,973.87	(17,973.87)	120
	TOTAL INTEREST EARNINGS	90,000.00	107,973.87	107,973.87	(17,973.87)	120
	OTHER GOVERNMENTS					
17.350.100	UPPER POTTSGROVE CONTRIBUTION	.00	28,267.00	28,267.00	(28,267.00)	0
	TOTAL OTHER GOVERNMENTS	.00	28,267.00	28,267.00	(28,267.00)	0
	INTERFUND OPERATING TRSFS					
17.392.008	TRANSFER FROM SEWER FUND 08	.00	500,000.00	500,000.00	(500,000.00)	0
	TOTAL INTERFUND OPERATING TRSFS	.00	500,000.00	500,000.00	(500,000.00)	0
	TOTAL FUND REVENUE	3,155,000.00	3,177,863.62	3,177,863.62	(22,863.62)	101

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER CAPITAL FUND 17

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	WASTE WATER TREATMENT					
17.429.740	CAP. PURCHASE -MAJOR- SEWER	50,000.00	.00	.00	50,000.00	0
	TOTAL WASTE WATER TREATMENT	50,000.00	.00	.00	50,000.00	0
	DEBT SERVICE					
17.471.100	BOND ADMINISTRATIVE FEES	5,000.00	8,482.96	8,482.96	(3,482.96)	170
17.471.200	BOND INTEREST EXPENSE	320,000.00	1,860,868.96	1,860,868.96	(1,540,868.96)	582
	TOTAL DEBT SERVICE	325,000.00	1,869,351.92	1,869,351.92	(1,544,351.92)	575
	AMORT/DEPREC					
17.473.810	AMORTIZATION EXPENSE	.00	60,367.40	60,367.40	(60,367.40)	0
17.473.811	DEPRECIATION EXPENSE	.00	862,862.58	862,862.58	(862,862.58)	0
	TOTAL AMORT/DEPREC	.00	923,229.98	923,229.98	(923,229.98)	0
	RESERVES					
17.499.100	TRANSFER TO RESERVES	2,780,000.00	.00	.00	2,780,000.00	0
	TOTAL RESERVES	2,780,000.00	.00	.00	2,780,000.00	0
	TOTAL FUND EXPENDITURES	3,155,000.00	2,792,581.90	2,792,581.90	362,418.10	89
	NET REVENUE OVER EXPENDITURES	.00	385,281.72	385,281.72	(385,281.72)	0

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER LINES FUND 18

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	FINANCE					
18.402.311	ACCOUNTING & AUDIT SERVICES	900.00	768.28	768.28	131.72	85
	TOTAL FINANCE	900.00	768.28	768.28	131.72	85
	IT - WEB NETWORK SRVCS					
18.407.452	COMP. SYSTEMS-COMCAST & RIDGE	1,500.00	1,054.80	1,054.80	445.20	70
18.407.453	COMPUTER SERVICS - DALLAS DATA	1,000.00	571.22	571.22	428.78	57
18.407.530	SUBSIDY TO FUND 01 - WAGES	481.00	481.00	481.00	.00	100
	TOTAL IT - WEB NETWORK SRVCS	2,981.00	2,107.02	2,107.02	873.98	71
	ENGINEERING					
18.408.313	ENGINEERING - SEWER LINES 18	1.00	.00	.00	1.00	0
	TOTAL ENGINEERING	1.00	.00	.00	1.00	0
	GENERAL GOV'T BUILDING					
18.409.361	ELECTRIC -PART OF BORO BLDG	16,200.00	19,364.95	19,364.95	(3,164.95)	120
18.409.362	GAS - BLDG HEATING FUEL	5,300.00	4,963.61	4,963.61	336.39	94
	TOTAL GENERAL GOV'T BUILDING	21,500.00	24,328.56	24,328.56	(2,828.56)	113
	PUBLIC WORKS					
18.430.241	GENERAL GOVERNMENTAL SUPPLIES	125.00	131.42	131.42	(6.42)	105
18.430.325	POSTAGE	125.00	.00	.00	125.00	0
18.430.327	PORTABLE RADIO/EQUIP. MAINT.	150.00	.00	.00	150.00	0
18.430.341	ADVERTISING	300.00	263.44	263.44	36.56	88
18.430.342	PRINTING/BINDING	100.00	.00	.00	100.00	0
18.430.373	BUILDING MAINT & CONTRACTS	200.00	.00	.00	200.00	0
18.430.374	REPAIRS - MACH. & EQUIPMENT	200.00	.00	.00	200.00	0
18.430.420	DUES, SUBSCRIPTS, MEMBERSHIPS	150.00	.00	.00	150.00	0
18.430.425	MEETING, SEMINAR, CONFERENCES	750.00	.00	.00	750.00	0
18.430.530	SUBSIDY TO FUND 01 - WAGES	45,677.00	45,677.00	45,677.00	.00	100
	TOTAL PUBLIC WORKS	47,777.00	46,071.86	46,071.86	1,705.14	96

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER LINES FUND 18

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	SEWER LINES					
18.436.110	PUBLIC WORKS WAGES	149,531.00	153,915.62	153,915.62	(4,384.62)	103
18.436.180	OVERTIME	10,000.00	8,661.72	8,661.72	1,338.28	87
18.436.184	EMPLOYEE WELLNESS PROGRAM	300.00	800.00	800.00	(500.00)	267
18.436.192	FICA TAX	12,227.00	12,001.61	12,001.61	225.39	98
18.436.210	OFFICE SUPPLIES	200.00	196.52	196.52	3.48	98
18.436.231	VEHICLE FUEL - GASOLINE	3,200.00	5,753.78	5,753.78	(2,553.78)	180
18.436.236	BUILDING & CLEANING SUPPLIES	400.00	97.05	97.05	302.95	24
18.436.238	CLOTHING/UNIFORMS	1,000.00	1,026.38	1,026.38	(26.38)	103
18.436.251	VEHICLE PARTS & REPAIRS	5,400.00	2,734.71	2,734.71	2,665.29	51
18.436.321	TELEPHONE	700.00	897.08	897.08	(197.08)	128
18.436.361	ELECTRIC -FLOW METERS & ALARMS	500.00	535.47	535.47	(35.47)	107
18.436.374	REPAIRS - MACH. & EQUIPMENT	100.00	235.39	235.39	(135.39)	235
18.436.375	MAINT REPAIRS OF SEWER LINES	145,000.00	91,351.59	91,351.59	53,648.41	63
18.436.376	MAINTENANCE OF METERS	4,000.00	383.87	383.87	3,616.13	10
18.436.420	DUES, SUBSCRIPTS, MEMBERSHIPS	100.00	40.00	40.00	60.00	40
18.436.425	MEETING, SEMINAR, CONFERENCES	300.00	447.00	447.00	(147.00)	149
18.436.460	CONTINUING ED - CONTRACTUAL	200.00	.00	.00	200.00	0
18.436.740	CAPITAL PURCHASES - MAJOR	200.00	.00	.00	200.00	0
18.436.750	CAPITAL PURCHASE -MINOR	.00	115.00	115.00	(115.00)	0
	TOTAL SEWER LINES	333,358.00	279,192.79	279,192.79	54,165.21	84
	MISCELLAENOUS					
18.480.100	MISCELLANEOUS EXPENSE	10.00	.00	.00	10.00	0
	TOTAL MISCELLAENOUS	10.00	.00	.00	10.00	0
	INSURANCES					
18.486.001	INSUR. CLAIM EXP & DEDUCTIBLES	500.00	.00	.00	500.00	0
18.486.100	INSURANCE - LIABILITY -CASUALT	6,000.00	6,005.99	6,005.99	(5.99)	100
18.486.200	INSURANCE - PROPERTY	7,300.00	7,291.46	7,291.46	8.54	100
18.486.600	INSURANCE - ERRORS & OMISSIONS	2,600.00	1,800.00	1,800.00	800.00	69
	TOTAL INSURANCES	16,400.00	15,097.45	15,097.45	1,302.55	92
	HEALTH & OTHER BENEFITS					
18.487.194	UNEMPLOYMENT COMPENSATION	400.00	478.25	478.25	(78.25)	120
18.487.195	WORKERS COMPENSATION	7,100.00	7,022.37	7,022.37	77.63	99
18.487.196	HEALTH/HOSPITALIZATION	49,050.00	40,620.02	40,620.02	8,429.98	83
18.487.198	NON-UNIFORMED LIFE AD&D	1,200.00	1,108.81	1,108.81	91.19	92
	TOTAL HEALTH & OTHER BENEFITS	57,750.00	49,229.45	49,229.45	8,520.55	85

BOROUGH OF POTTSTOWN
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 12 MONTHS ENDING DECEMBER 31, 2013

SEWER LINES FUND 18

		BUDGET	PERIOD ACTUA	YTD ACTUAL	UNEXPENDED	PRC
	SHARED EMPLOYEE BENEFITS					
18.488.195	INDIRECT WORKERS COMPENSATION	6,100.00	5,826.42	5,826.42	273.58	96
18.488.196	INDIRECT HEALTH/HOSPITALIZTION	38,150.00	31,353.88	31,353.88	6,796.12	82
18.488.198	INDIRECT NON-UNIFORM LIFE AD&D	200.00	159.59	159.59	40.41	80
	TOTAL SHARED EMPLOYEE BENEFITS	44,450.00	37,339.89	37,339.89	7,110.11	84
	TOTAL FUND EXPENDITURES	525,127.00	454,135.30	454,135.30	70,991.70	86
	NET REVENUE OVER EXPENDITURES	.00	56,950.54	56,950.54	(56,950.54)	0

Appendix K

Utility Name	Exeter Township PA (dissolved Authority in 2011)
Prepared by:	Steve Marcino
Contact	Paul Herb
Email/phone	pherb@exetertownship.com 610.582.8300
Flows: Average/Design/Peak	Q avg = 4.7 MGD Q design = 7.1 MGD (East and West plant) Q max = 19 MGD
Process	Headworks Grit removal, screenings, centrifuge and shredder, JP Mascaro disposes solids and anaerobic digester: 4 primary tanks, first stage aeration fine bubble, 3 trains, 4 final clarifiers and chlorine to Schuylkill River. No BNR/TN or Po4 removal
Disinfection	Chlorine gas – 1 ton and 150 # cylinders – looked at UV but cost was double to install
Combined heat and power/Generator?	Anaerobic gas – looked at CHP but payback was to far out - over 10 years. Use Landfill Pioneer crossing. Accept Leachate from 7 landfills
Organizational Chart Staff count	14 including super and assist super (2) 12 teamsters: 3 maintenance 4 operators certified 3 assistant operators 2 collection system 105 miles sewer plus 7 pump stations, sampling, billing, dryer
Budget Revenues Expenses	2014 Budget: $5.166 M Revenue, $5.303 Costs deficit, variable costs with Leachate increase at Landfills – made $1m by taking in Septage, Solids and Leachate
User Fees	$23/quarter for 5000 gallons $15.60/quarter service charge $38.60 min charge 5000 gallons or less

Bulk program? Yes or no	Yes $0.022/gallon – biosolids $0.016/gallon $0.022/gallon – septage $0.032/gallon – high ammonia septage Industrial varies
Solids: Dryer? Digestion Class A and B?	Fenton Dryer (Texas) installed 2008, Class A to farm – charge $10/ton or give away Fenton dryer Texas Batch process Only produce Class A, Like dryer - $97/ton to Mascaro for disposal to landfill Class B as backup Use Polydyne as polymer
$/ton: Class A Class B	Class A charge - $10/ton or give away
Capital	Act 537 Plan – need new trunkline Dissolved Authority – Gannett is sewer engineer and Entech designed dryer
Electricity	Meted – they have 2 generators that power 75% of plant
Polymer	Buy in bulk – do not mix on site
High Rain Event	When plant saw 19 MGD, 5.3 inches of rain, it made permit, use empty first stage aeration tanks as EQ tanks, contact PaDEP

Utility Name	Lancaster Area Sewer Authority (LASA)
Prepared by:	Steve Marcino, JMT
Contact	John Dietrich and Mike Kyle, ED
Email/phone	717-344-5832 717-299-4843
Flows: Average/Design/Peak	Q avg = 9.5 MGD Q design = 15 MGD Q peak day = 24 MGD Q peak = 36 MGD
Process	Activated sludge and BNR (TN = 6 mg/l and PO4 = 2 mg/l) Po4 – use ferrous sulfate
Disinfection	Hypochlorite (was changed from gas) due to TRC and safety issues
Combined heat and power/Generator?	No digesters (yet) – solids land application - Class B Generated by centrifuges
Organizational Chart Staff count	Staff at plant – 11 who are focused on plant and lab only (no water treatment) Also Staff of 17 operators handle the collection system including 38 pumping stations
Budget Revenues Expenses	2014 O&M Budget : $15 million plus reserve funds
User Fees	$89/quarter residential
Bulk program? Yes or no	Receive truck waste and septic
Solids: Dryer?	No dryer, no digestors , Class B land applied add lime – they are proposing new solids project: 2 anaerobic digesters and a dryer (no CHP)

Digestion Class A and B?	
$/ton: Class A Class B	Class B only
Capital	New office building , maybe biosolids design, implemented MMS Cityworks and Asset management program
Electric	PPL variable rates No generators – dual feeds

Utility Name	Valley Forge Sewer Authority
Prepared by:	Steve Marcino
Contact	Martin Goldberg, Manager
Email/phone	610.935.1553 x 226
Flows: Average/Design/Peak	Q design = upgrading from 9.2 MGD to 11.6 MGD (new clarifier, new thickening, new centrifuge) Q average = 7. 0 MGD Q max = 17 MGD
Process	Activated sludge and extended air No denit - Monitor only for TN and Po4
Disinfection	Changing to UV disinfection Trogan (gas RMP and capacity) cost $2.2 million
Combined heat and power/Generator?	No digesters
Organizational Chart Staff count by function	Staff:20 full time, plant and collection (includes admin and management) 6 certified operators and 9 employees are at the plant plus 10 pumping stations - Authority bills its customers
Budget Revenues Expenses	2013 Budget: $3.2 M – 2013 rev $3.16 M – 2013 expenses
Schedule	Operate 24/7 at the plant
User Fees	$300/year/EDU $75/quarter per EDU
Bulk program? Yes or no	Receive Septic and outside wastes
Solids: Dryer? Digestion Class A and B?	No digesters – centrifuge hydrated lime – Class A land applied
$/ton:	No Dryer - Pay Synagro - $34/ton transportation and disposal to

Class A Class B	Lancaster - Use Polydyne polymer
Capital improvements	Nothing major except for the upgrade I&I – cleaning and online monitoring – Cloud based
Electric	PECO and Constellation Energy $0.075 per KWHr Dual feeds
Miles of Collection	25 miles plus 10 pump stations
High Rain Event	Not a big issue Gpd/edu – 220 gpd/edu

Utility Name	Wyomissing Joint Sewer Authority
Prepared by:	Steve Marcino, JMT
Contact	Dave Wisser, Authority Manager Email
Email/phone	610.376.1756
Flows: Average/Design/Peak	Q avg = 2.54 MGD Q design = 4 MGD Q peak = 14 MGD
Process	Trickling Filter followed by Activated Sludge, no collection, no tertiary , no TN and/or PO4 removal
Disinfection	UV – TRC requirement and safety issues
Combined heat and power/Generator?	Too small – don't generate enough methane gas
Organizational Chart Staff count	9 full time including management, 8 certified operators and 1 part timer (no collection system)
Budget Revenues Expenses	2014 – Revenue and expenses? Dave will send
Schedule	Run dryer for 4 ten hour days, run continuously for 4 weeks, shut down for week 5 as batch process
User Fees	Handled by Borough
Bulk program? Yes or no	No (primarily a residential development area)
Solids: Dryer? Digestion Class A and B?	Yes plus 2 Anaerobic Digesters; happy with their dryer (Komline Sanderson) no problems – generate 175 dry tons/year
$/ton: Class A and Class B	Haul to 3 farmers at no charge

Class B	
Capital	No major projects planned
Electric	Meted $0.078 per KWHR Use 2 generators and load share
Other	Arro is their engineer

Utility Name	Derry Township Municipal Authority
Prepared by:	Steve Marcino
Contact	Wayne Schultz, Assistant Manager wschutz@DTMA.com
Email/phone	717.566.3237 x 312
Flows: Average/Design/Peak	Q Avg = 3.75 MGD East Plant Q Design = 5.02 MGD Q Peak = 6.5 MGD Q max = 21 MGD
Process	Primary, A2O process, ferric for Po4 control and final clarifiers: TN = 6 mg/l, PO4 = 0.8 mg/l
Disinfection	UV (converted gas in 1990s) – Trojan 4000
Combined heat and power/Generator?	Yes, in 2012
Organizational Chart Staff count	NA but staff count is as follows: 32 employees: 8 admin (include manager) 3-1/2 tech services (Wayne plus lab) 6 collections, 4 maintenance, 12 operations, most are certified-14 pump stations
Budget Revenues Expenses	Revenue = $8.75 m
User Fees	$9.90/month – flat plus $4.70/1000 gallons
Bulk program? Yes or no	Receive septage and outside wastes: $35/1000 gallon, $105/1000 gallons Use honor system plus manifest, positive impact to plant to increase gas to digester
Salary range per job descriptions	NA

Solids: Dryer? Digestion Class A and B?	Yes and 1 anaerobic digester Yes, Class A and B Produce around 1400-1500 dry tons/year Use Polydyne for polymer 15# per dry ton
$/ton: Class A Class B	Class A - Receive $10/ton for farmers to pick up Class B – Hauling agreement with Jesse Barro (like PBA)
Capital	Second cogen unit
Electric	PPL $0.08 per KWHr or $0.10 per KWHr East plant has generator, West plant has 2 dual feeds
Other	Buchart Horn is their engineer

Utility Name	Downingtown Area Regional Authority
Prepared by:	Steve Marcino
Contact	Herb Mays 610.269.4084
Email/phone	daraherb@verizon.net
Flows: Average/Design/Peak	Q design = 7.5 MGD Q avg = 6.0 MGD Q Peak = 18 MGD heavy rain
Process	Activated sludge process plus tertiary treatment TN = 30 and PO4 = 2
Disinfection	Chlorine – gas chlorine
Combined heat and power/Generator?	No – No digesters
Organizational Chart Staff count/Structure	Herb is only Authority employee, Severn Trent operates their system – Serve Borough and 3 Townships (staff 16 – 5 certified)
Sewer Agreement	Yes, have Sewer Agreement – no surcharge if flow is exceeded but need to provide CAP if flow is close to 90% of agreement
Budget Revenues Expenses	$3.9 Revenue and Costs
Operator Schedule	NA
User Fees	5 municipalities different rates: $1.60/1000 gallons (capital, operation, admin, debt service) 1986 - upgrade
Bulk program? Yes or no	Do not receive outside biosolids
Solids: Dryer? Digestion Class A and B? Sewer Agreement	No – produce Class B that is land applied: 7500 tons/year $36/ton pay for land application $63/ton for landfill

Capital	Electrical improvements 2015 – Power transformation
Polymer	260,000 #s/year $0.096/#
Electric	PECO 100 % backup power by generators: $0.0585 per KWHr supply $0.079 per KWHr $0.14 per KWHr for high voltage

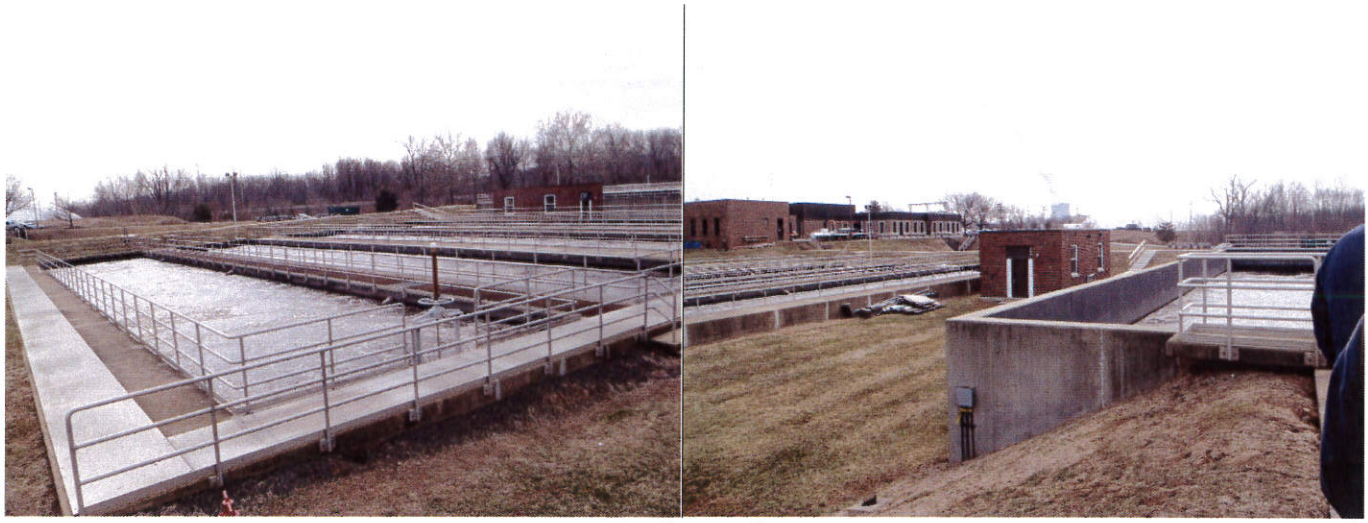
Appendix L

Pottstown Borough Authority
WWTP Photographs (March 2014)

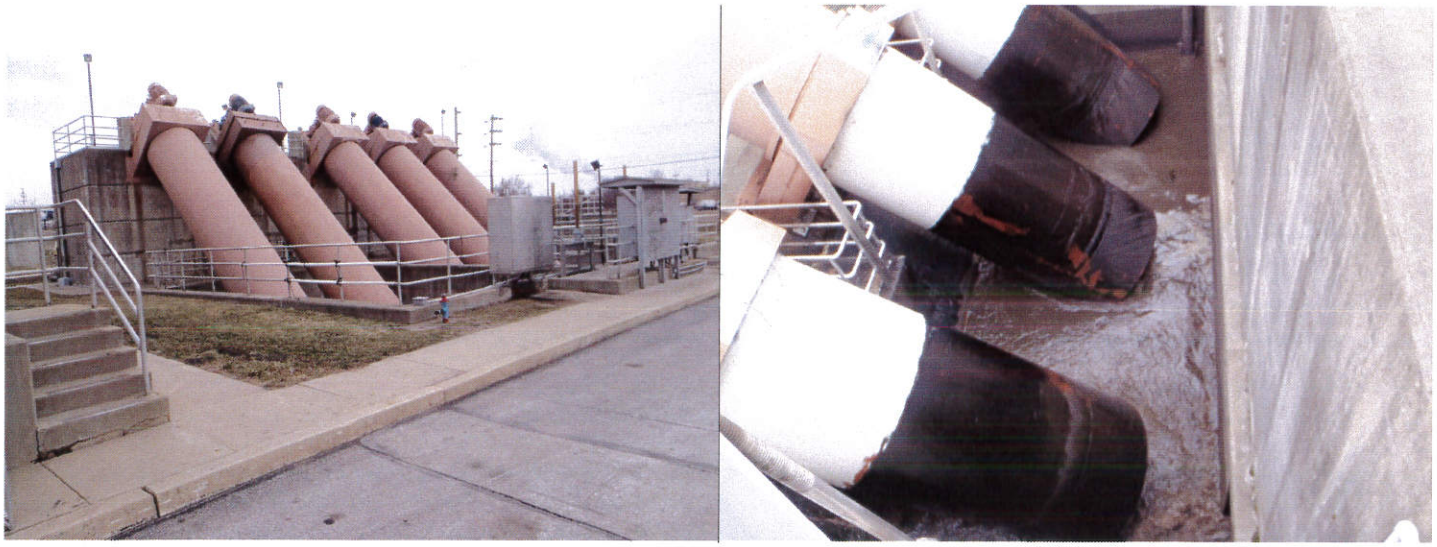
Influent Pump Station

Mechanical Bar Screen

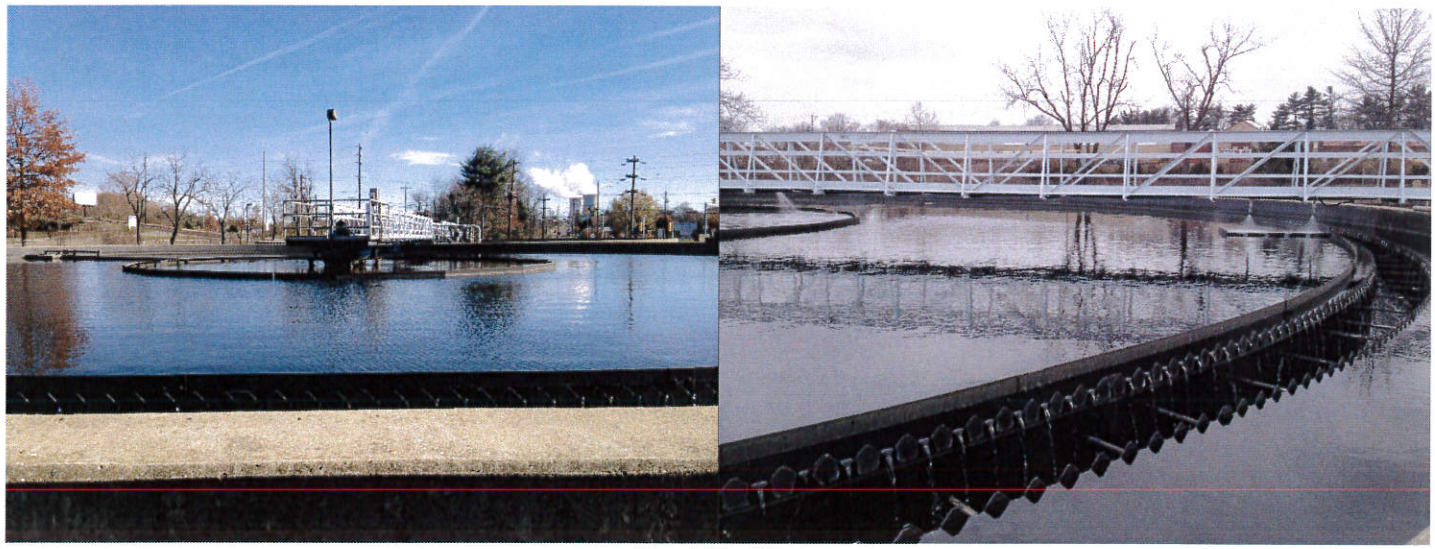
Pre-Aeration Grit Chamber



Aeration Tanks

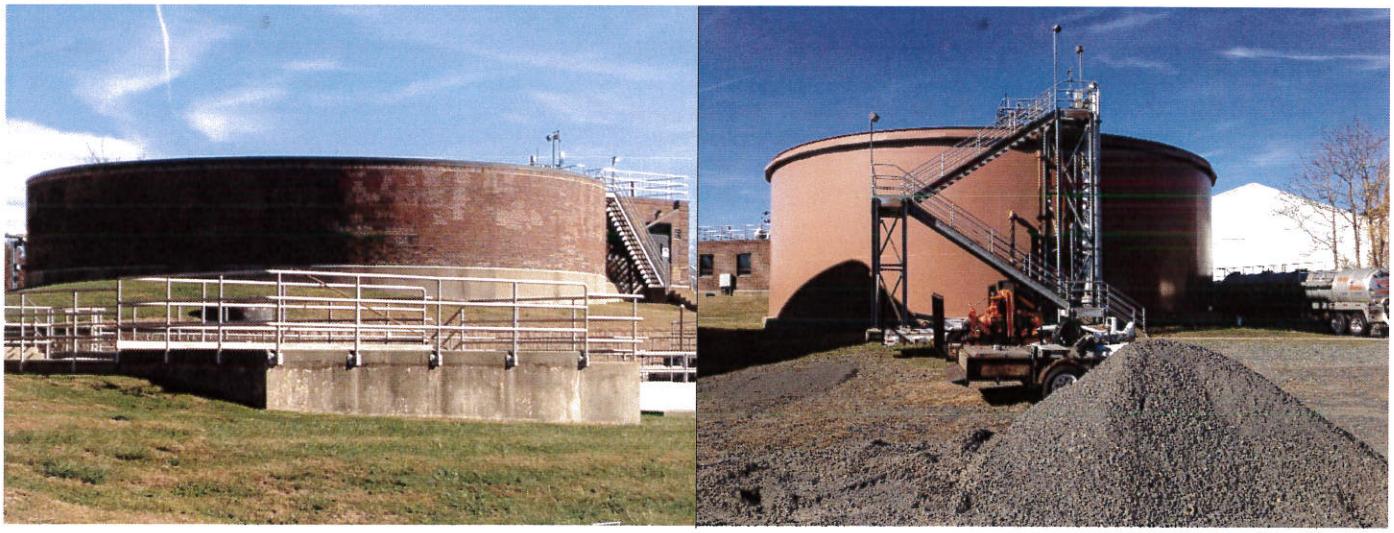


Mechanical Screw Pumps



Final Clarifier

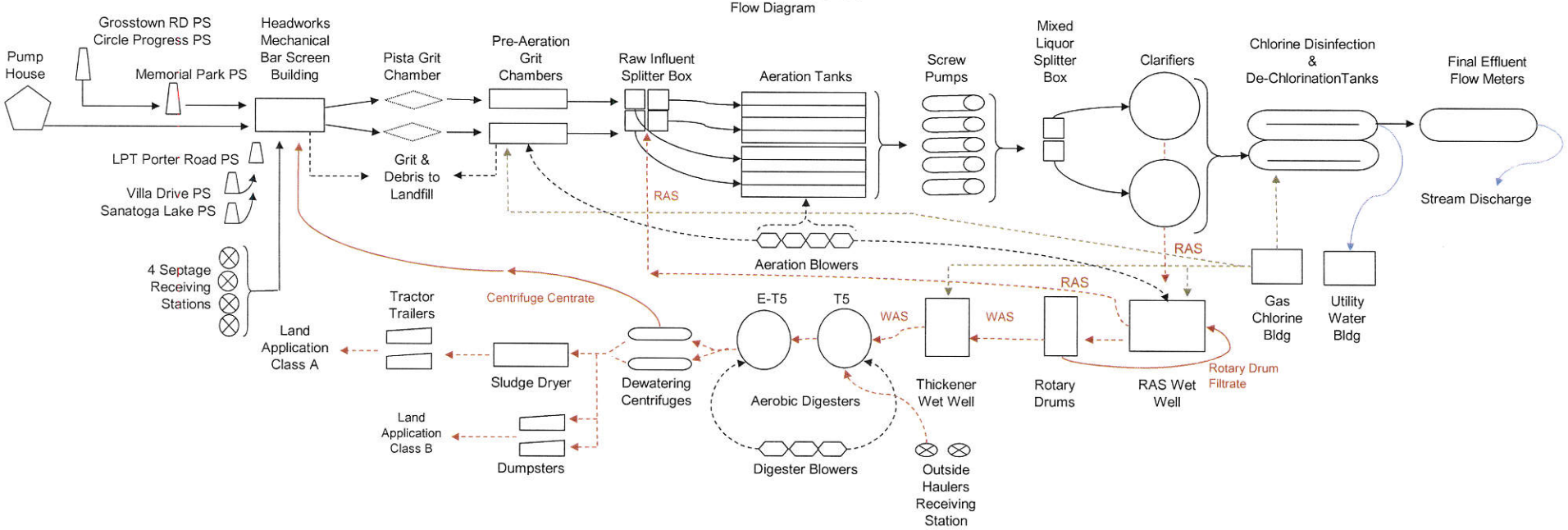
Chlorination and Dechlorination Tank



Aerobic Digesters

Appendix M

POTTSTOWN BOROUGH AUTHORITY
Wastewater Treatment Plant
Flow Diagram



Appendix N

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM DISCHARGE REQUIREMENTS FOR PUBLICLY OWNED TREATMENT WORKS (POTWs)

NPDES PERMIT NO: PA0026786
Amendment No. 1

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 *et seq.* ("the Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 *et seq.*,

Pottstown Borough Authority
100 East High Street
Pottstown, PA 19464

is authorized to discharge from a facility known as **Pottstown Borough STP**, located at **Pottstown Borough, Montgomery County**, to **Schuylkill River** in Watershed(s) **3-D** in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B and C hereof.

THIS PERMIT SHALL BECOME EFFECTIVE ON FEBRUARY 1, 2014

THIS PERMIT SHALL EXPIRE AT MIDNIGHT ON OCTOBER 31, 2014

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with the terms, conditions or effluent limitations of this permit is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. (40 CFR 122.41(a))

3. A complete application for renewal of this permit, or notice of intent to cease discharging by the expiration date, must be submitted to DEP at least 180 days prior to the above expiration date (unless permission has been granted by DEP for submission at a later date), using the appropriate NPDES permit application form. (40 CFR 122.41(b), 122.21(d))

   In the event that a timely and complete application for renewal has been submitted and DEP is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit, including submission of the Discharge Monitoring Reports (DMRs), will be automatically continued and will remain fully effective and enforceable against the discharger until DEP takes final action on the pending permit application. (25 Pa. Code 92a.7(b), (c))

4. This NPDES permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

DATE PERMIT ISSUED October 19, 2009 **ISSUED BY**
DATE PERMIT AMENDMENT ISSUED January 27, 2014

Jenifer L. Fields, P.E.
Clean Water Program Manager
Southeast Regional Office

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001, Latitude 40° 14' 09", Longitude 75° 37' 30", River Mile Index 51.9, Stream Code 00833

Receiving Waters: Schuylkill River

Type of Effluent: Treated effluent from Pottstown Borough STP

1. The permittee is authorized to discharge during the period from February 1, 2014 through October 31, 2014.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instant. Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	Report	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5 May 1 - Oct 31	2,143	3,215	XXX	20	30	40	1/day	24-Hr Composite
CBOD5 Nov 1 - Apr 30	2,679	4,287	XXX	25	40	50	1/day	24-Hr Composite
Total Suspended Solids	3,215	4,823	XXX	30	45	60	1/day	24-Hr Composite
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1,000*	1/day	Grab
Ammonia-Nitrogen May 1 - Oct 31	857	XXX	XXX	8.0	XXX	16.0	1/day	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	1,714	XXX	XXX	16.0	XXX	32.0	1/day	24-Hr Composite

Outfall 001, Continued (from February 1, 2014 through October 31, 2014)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instant. Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Phosphorus	Report	XXX	XXX	Report	XXX	Report	1/week	24-Hr Composite
Total Nitrogen	Report	XXX	XXX	Report	XXX	Report	1/week	24-Hr Composite
Total Dissolved Solids** (Avg. Mo. Flow <= 8.935 MGD)	Report	200,290 Daily Maximum	XXX	Report	3000 Daily Maximum	Report	1/day	24-Hr Composite
Total Dissolved Solids** (Avg. Mo. Flow > 8.935 MGD)	Report	240,000 Daily Maximum	XXX	Report	2238 Daily Maximum	Report	1/day	24-Hr Composite
Total Aluminum***	XXX	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Total Copper***	XXX	XXX	XXX	0.040	XXX	0.074	1/month	24-Hr Composite
Total Mercury (ng/L)***	XXX	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Total Zinc***	XXX	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Benzidine***	XXX	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
CBOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/day	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/day	24-Hr Composite

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001 *Not to exceed 1,000/100ml as an instantaneous maximum from May 1st through September 30th. Not to exceed 1,000/100ml in greater than 10 percent of the samples tested from October 1st through April 30th. See Part C.I.Other Requirement F. **For Total Dissolved Solids, effluent limitations are tiered based on average monthly flow. See Part.C.I.Other Requirement P. ***See Part C.I. Other Requirement J.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. B. For Outfall 002****, Latitude 40° 14' 04", Longitude 75° 37' 44", River Mile Index 51.8, Stream Code 00833

Receiving Waters: Schuylkill River

Type of Effluent: Site stormwater

1. The permittee is authorized to discharge during the period from February 1, 2014 through October 31, 2014.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly		Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 002 ****See Part C.III. Requirements Applicable to Stormwater Outfalls

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)

Additional Requirements

1. The permittee may not discharge:

   a. Floating solids, scum, sheen or substances that result in observed deposits in the receiving water. (25 Pa Code 92a.41(c))

   b. Oil and grease in amounts that cause a film or sheen upon or discoloration of the waters of this Commonwealth or adjoining shoreline, or that exceed 15 mg/l as a daily average or 30 mg/l at any time (or lesser amounts if specified in this permit). (25 Pa. Code 92a.47(a)(7) and 95.2(2))

   c. Substances in concentration or amounts sufficient to be inimical or harmful to the water uses to be protected or to human, animal, plant or aquatic life. (25 Pa Code 93.6(a))

   d. Foam or substances that produce an observed change in the color, taste, odor or turbidity of the receiving water, unless those conditions are otherwise controlled through effluent limitations or other requirements in this permit. (25 Pa Code 92a.41(c))

2. The monthly average percent removal of BOD_5 or $CBOD_5$ and TSS must be at least 85% for POTW facilities on a concentration basis except where 25 Pa. Code 92a.47(g) and (h) are applicable to facilities with combined sewer overflows (CSOs) or as otherwise specified in this permit. (25 Pa. Code 92a.47(a)(3))

3. If the permit requires the reporting of average weekly statistical results, the maximum weekly average concentration and maximum weekly average mass loading shall be reported, regardless of whether the results are obtained for the same or different weeks.

4. The permittee shall monitor the sewage effluent discharge(s) for the effluent parameters identified in the Part A limitations table(s) during all bypass events at the facility, using the sample types that are specified in the limitations table(s). Where the required sample type is "composite", the permittee must commence sample collection within one hour of the start of the bypass, wherever possible. The results shall be reported on the Daily Effluent Monitoring supplemental form (3800-FM-BPNPSM0435) and be incorporated into the calculations used to report self-monitoring data on Discharge Monitoring Reports (DMRs).

Footnotes

(1) When sampling to determine compliance with mass effluent limitations, the discharge flow at the time of sampling must be measured and recorded.

(2) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events.

Supplemental Information

(1) The hydraulic design capacity of 15.600000 million gallons per day for the treatment facility is used to prepare the annual Municipal Wasteload Management Report to help determine whether a "hydraulic overload" situation exists, as defined in Title 25 Pa. Code Chapter 94.

(2) The effluent limitations for Outfall 001 were determined using an effluent discharge rate of 12.85 MGD.

(3) The organic design capacity of 23000.00 lbs BOD_5 per day for the treatment facility is used to prepare the annual Municipal Wasteload Management Report to determine whether an "organic overload" condition exists, as defined in 25 Pa. Code Chapter 94.

(4) Total Nitrogen is the sum of Total Kjeldahl-N (TKN) plus Nitrite-Nitrate as N (NO_2+NO_3-N), where TKN and NO_2+NO_3-N are measured in the same sample.

II. DEFINITIONS

At Outfall (XXX) means a sampling location in outfall line XXX below the last point at which wastes are added to outfall line (XXX), or where otherwise specified.

Average refers to the use of an arithmetic mean, unless otherwise specified in this permit. (40 CFR 122.41(l)(4)(iii))

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollution to surface waters of the Commonwealth. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. (25 Pa. Code 92a.2)

Bypass means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR 122.41(m)(1)(i))

Calendar Week is defined as the seven consecutive days from Sunday through Saturday, unless the permittee has been given permission by DEP to provide weekly data as Monday through Friday based on showing excellent performance of the facility and a history of compliance. In cases when the week falls in two separate months, the month with the most days in that week shall be the month for reporting.

Clean Water Act means the Federal Water Pollution Control Act, as amended (33 U.S.C.A. §§1251 to 1387).

Composite Sample (for all except GC/MS volatile organic analysis) means a combination of individual samples (at least eight for a 24-hour period or four for an 8-hour period) of at least 100 milliliters (mL) each obtained at spaced time intervals during the compositing period. The composite must be flow-proportional; either the volume of each individual sample is proportional to discharge flow rates, or the sampling interval is proportional to the flow rates over the time period used to produce the composite. (EPA Form 2C)

Composite Sample (for GC/MS volatile organic analysis) consists of at least four aliquots or grab samples collected during the sampling event (not necessarily flow proportioned). The samples must be combined in the laboratory immediately before analysis and then one analysis is performed. (EPA Form 2C)

Daily Average Temperature means the average of all temperature measurements made, or the mean value plot of the record of a continuous automated temperature recording instrument, either during a calendar day or during the operating day if flows are of a shorter duration.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day. (25 Pa. Code 92a.2, 40 CFR 122.2)

Daily Maximum Discharge Limitation means the highest allowable "daily discharge."

Discharge Monitoring Report (DMR) means the DEP or EPA supplied form(s) for the reporting of self-monitoring results by the permittee. (25 Pa. Code 92a.2 and 40 CFR 122.2)

Estimated Flow means any method of liquid volume measurement based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters and batch discharge volumes.

Geometric Mean means the average of a set of n sample results given by the nth root of their product.

Grab Sample means an individual sample of at least 100 mL collected at a randomly selected time over a period not to exceed 15 minutes. (EPA Form 2C)

Hauled-In Wastes means any waste that is introduced into a treatment facility through any method other than a direct connection to the sewage collection system. The term includes wastes transported to and disposed of within the treatment facility or other entry points within the collection system.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the Clean Water Act. (40 CFR 122.2)

Immersion Stabilization (i-s) means a calibrated device is immersed in the wastewater until the reading is stabilized.

Indirect Discharger means a non-domestic discharger introducing pollutants to a Publicly Owned Treatment Works (POTW) or other treatment works. (25 Pa. Code 92a.2 and 40 CFR 122.2)

Industrial User means a source of Indirect Discharge. (40 CFR 403.3)

Instantaneous Maximum Effluent Limitation means the highest allowable discharge of a concentration or mass of a substance at any one time as measured by a grab sample. (25 Pa. Code 92a.2)

Measured Flow means any method of liquid volume measurement, the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

Monthly Average Discharge Limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. (25 Pa. Code 92a.2)

Municipality means a city, town, borough, county, township, school district, institution, authority or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes. (25 Pa. Code 92a.2)

Publicly Owned Treatment Works (POTW) means a treatment works as defined by §212 of the Clean Water Act, owned by a state or municipality. The term includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. The term also includes sewers, pipes or other conveyances if they convey wastewater to a POTW providing treatment. The term also means the municipality as defined in section 502(4) of the Clean Water Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works. (25 Pa Code 92a.2 and 40 CFR 122.2)

Severe Property Damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 CFR 122.41(m)(1)(ii))

Stormwater means the runoff from precipitation, snow melt runoff, and surface runoff and drainage. (25 Pa. Code 92a.2)

Stormwater Associated With Industrial Activity means the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant, and as defined at 40 CFR §122.26(b)(14)(i) – (ix) and (xi) and 25 Pa. Code 92a.2.

Toxic Pollutant means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains may, on the basis of information available to DEP cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, including malfunctions in reproduction, or physical deformations in these organisms or their offspring. (25 Pa. Code 92a.2)

Weekly Average Discharge Limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

III. SELF-MONITORING, REPORTING AND RECORDKEEPING

A. Representative Sampling

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity (40 CFR 122.41(j)(1)). Representative sampling includes the collection of samples, where possible, during periods of adverse weather, changes in treatment plant performance and changes in treatment plant loading. If possible, effluent samples must be collected where the effluent is well mixed near the center of the discharge conveyance and at the approximate mid-depth point, where the turbulence is at a maximum and the settlement of solids is minimized. (40 CFR 122.48 and 25 Pa. Code § 92a.61)

2. Records Retention (40 CFR 122.41(j)(2))

   Except for records of monitoring information required by this permit related to the permittee's sludge use and disposal activities which shall be retained for a period of at least 5 years, all records of monitoring activities and results (including all original strip chart recordings for continuous monitoring instrumentation and calibration and maintenance records), copies of all reports required by this permit, and records of all data used to complete the application for this permit shall be retained by the permittee for 3 years from the date of the sample measurement, report or application, unless a longer retention period is required by the permit. The 3-year period shall be extended as requested by DEP or the EPA Regional Administrator.

3. Recording of Results (40 CFR 122.41(j)(3))

   For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

   a. The exact place, date and time of sampling or measurements.
   b. The person(s) who performed the sampling or measurements.
   c. The date(s) the analyses were performed.
   d. The person(s) who performed the analyses.
   e. The analytical techniques or methods used; and the associated detection level.
   f. The results of such analyses.

4. Test Procedures (40 CFR 122.41(j)(4))

   Facilities that test or analyze environmental samples used to demonstrate compliance with this permit shall be in compliance with laboratory accreditation requirements of Act 90 of 2002 (27 Pa. C.S. §§4101-4113) and 25 Pa. Code Chapter 252, relating to environmental laboratory accreditation. Unless otherwise specified in this permit, the test procedures for the analysis of pollutants shall be those approved under 40 CFR Part 136 (or in the case of sludge use or disposal, approved under 40 CFR Part 136, unless otherwise specified in 40 CFR Part 503 or Subpart J of 25 Pa. Code Chapter 271), or alternate test procedures approved pursuant to those parts, unless other test procedures have been specified in this permit.

5. Quality/Assurance/Control

   In an effort to assure accurate self-monitoring analyses results:

   a. The permittee, or its designated laboratory, shall participate in the periodic scheduled quality assurance inspections conducted by DEP and EPA. (40 CFR 122.41(e), 122.41(i)(3))

   b. The permittee, or its designated laboratory, shall develop and implement a program to assure the quality and accurateness of the analyses performed to satisfy the requirements of this permit, in accordance with 40 CFR Part 136. (40 CFR 122.41(j)(4))

B. Reporting of Monitoring Results

1. The permittee shall effectively monitor the operation and efficiency of all wastewater treatment and control facilities, and the quantity and quality of the discharge(s) as specified in this permit. (40 CFR 122.41(e), 122.44(i)(1))

2. Discharge Monitoring Reports (DMRs) must be completed in accordance with DEP's published DMR Instructions (3800-FM-BPNPSM0463). DMRs are based on calendar reporting periods. DMR(s) must be received by the agency(ies) specified in paragraph 3 below in accordance with the following schedule:

   - Monthly DMRs must be received within 28 days following the end of each calendar month.

   - Quarterly DMRs must be received within 28 days following the end of each calendar quarter, i.e., January 28, April 28, July 28, and October 28.

   - Semiannual DMRs must be received within 28 days following the end of each calendar semiannual period, i.e., January 28 and July 28.

   - Annual DMRs must be received by January 28, unless Part C of this permit requires otherwise.

3. The permittee shall complete all Supplemental Reporting forms (Supplemental DMRs) provided by DEP in this permit (or an approved equivalent), and submit the signed, completed forms as an attachment to the DMR(s). If the permittee elects to use DEP's electronic DMR (eDMR) system, one electronic submission may be made for DMRs and Supplemental DMRs. If paper forms are used, the completed forms shall be mailed to:

   Department of Environmental Protection
   Clean Water Program
   2 East Main Street
   Norristown, PA 19401

   NPDES Enforcement Branch (3WP42)
   Office of Permits & Enforcement
   Water Protection Division
   U.S. EPA - Region III
   1650 Arch Street
   Philadelphia, PA 19103-2029

4. If the permittee elects to begin using DEP's eDMR system to submit DMRs required by the permit, the permittee shall, to assure continuity of business operations, continue using the eDMR system to submit all DMRs and Supplemental Reports required by the permit, unless the following steps are completed to discontinue use of eDMR:

   a. The permittee shall submit written notification to the regional office that issued the permit that it intends to discontinue use of eDMR. The notification shall be signed by a principal executive officer or authorized agent of the permittee.

   b. The permittee shall continue using eDMR until the permittee receives written notification from DEP's Central Office that the facility has been removed from the eDMR system, and electronic report submissions are no longer expected.

5. The completed DMR Form shall be signed and certified by either of the following applicable persons, as defined in 25 Pa. Code 92a.22:

   - For a corporation - by a principal executive officer of at least the level of vice president, or an authorized representative, if the representative is responsible for the overall operation of the facility from which the discharge described in the NPDES form originates.

- For a partnership or sole proprietorship - by a general partner or the proprietor, respectively.
- For a municipality, state, federal or other public agency - by a principal executive officer or ranking elected official.

If signed by a person other than the above, written notification of delegation of DMR signatory authority must be submitted to DEP in advance of or along with the relevant DMR form. (40 CFR 122.22(b))

6. If the permittee monitors any pollutant at monitoring points as designated by this permit, using analytical methods described in Part A III.A.4. herein, more frequently than the permit requires, the results of this monitoring shall be incorporated, as appropriate, into the calculations used to report self-monitoring data on the DMR. (40 CFR 122.41(l)(4)(ii))

C. Reporting and Notification Requirements

1. Planned Changes to Physical Facilities – The permittee shall give notice to DEP as soon as possible but no later than 30 days prior to planned physical alterations or additions to the permitted facility. A permit under 25 Pa. Code Chapter 91 may be required for these situations prior to implementing the planned changes. A permit application, or other written submission to DEP, can be used to satisfy the notification requirements of this section.

   Notice is required when:

   a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b). (40 CFR 122.41(l)(1)(i))

   b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are not subject to effluent limitations in this permit. (40 CFR 122.41(l)(1)(ii))

   c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 CFR 122.41(l)(1)(iii))

   d. The planned change may result in noncompliance with permit requirements. (40 CFR 122.41(l)(2))

2. Planned Changes to Waste Stream – Under the authority of 25 Pa. Code 92a.24(a) and 40 CFR 122.42(b), the permittee shall provide notice to DEP and EPA as soon as possible but no later than 45 days prior to any planned changes in the volume or pollutant concentration of its influent waste stream as a result of indirect discharges or hauled-in wastes, as specified in paragraphs 2.a. and 2.b., below. Notice shall be provided on the "Planned Changes to Waste Stream" Supplemental Report (3800-FM-BPNPSM0482), available on DEP's website. The permittee shall provide information on the quality and quantity of waste introduced into the POTW, and any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW (40 CFR 122.42(b)(3)). The Report shall be sent via Certified Mail or other means to confirm DEP's receipt of the notification. DEP will determine if the submission of an application and receipt of an amended permit is required.

   a. Introduction of New Pollutants (25 Pa. Code 92a.24(a), 40 CFR 122.42(b)(1))

      New pollutants are defined as parameters that meet one or more of the following criteria:

      (i) Were not detected in the facilities' influent waste stream as reported in the permit application; were not otherwise analyzed in the influent and reported to DEP prior to permit issuance; and have not been previously approved to be included in the permittee's influent waste stream by DEP and/or EPA in writing.

(ii) Are previously unapproved pollutants introduced into the POTW from an indirect discharger which would be subject to Sections 301 and 306 of the Clean Water Act if it were directly discharging those pollutants (40 CFR 122.42(b)(1)).

The permittee shall provide notification of the introduction of new pollutants in accordance with paragraph 2 above. The permittee may not authorize the introduction of new pollutants until the permittee receives DEP's and/or EPA's written approval.

b. Increased Loading of Approved Pollutants (25 Pa. Code 92a.24(a), 40 CFR 122.42(b)(2))

Approved pollutants are defined as parameters that meet one or more of the following criteria:

(i) Were detected in the facilities' influent waste stream as reported in the permittee's permit application; were otherwise analyzed in the influent and reported to DEP prior to permit issuance; or have been previously approved to be included in the permittee's influent waste stream by DEP and/or EPA in writing.

(ii) Have an effluent limitation or monitoring requirement in this permit.

The permittee shall provide notification of the introduction of increased influent loading (lbs/day) of approved pollutants in accordance with paragraph 2 above when (1) the cumulative increase in influent loading (lbs/day) exceeds 20% of the maximum loading reported in the permit application, or a loading previously approved by DEP and/or EPA, or (2) may cause an exceedance in the effluent of Effluent Limitation Guidelines (ELGs) or limitations in Part A of this permit, or (3) may cause interference or pass through at the POTW, or (4) may cause exceedances of the applicable water quality standards in the receiving stream. Unless specified otherwise in this permit, if DEP and/or EPA does not respond to the notification within 30 days of its receipt, the permittee may proceed with the increase in loading. The acceptance of increased loading of approved pollutants may not result in an exceedance of ELGs or effluent limitations, may not result in a hydraulic or organic overload condition as defined in 25 Pa. Code 94.1, and may not cause exceedances of the applicable water quality standards in the receiving stream.

3. Reporting Requirements for Hauled-In Wastes

a. Receipt of Residual Waste

(i) The permittee shall document the receipt of all hauled-in residual wastes (including but not limited to wastewater from oil and gas wells, food processing waste, and landfill leachate) received for processing at the treatment facility. The permittee shall report hauled-in residual wastes on a monthly basis to DEP on the "Hauled In Residual Wastes" Supplemental Report (3800-FM-BPNPSM0450) as an attachment to the DMR. If no residual wastes were received during a month, submission of the Supplemental Report is not required.

The following information is required by the Supplemental Report. The information used to develop the Report shall be retained by the permittee for five years from the date of receipt and must be made available to DEP or EPA upon request.

(1) The dates that residual wastes were received.

(2) The volume (gallons) of wastes received.

(3) The license plate number of the vehicle transporting the waste to the treatment facility.

(4) The permit number(s) of the well(s) where residual wastes were generated, if applicable.

(5) The name and address of the generator of the residual wastes.

(6) The type of wastewater.

(7) Documentation of whether or not a chemical analysis of the residual wastes were reported on a Residual Waste Form 26R, or a separate waste characterization using the parameters from Form 26R.

The transporter of residual waste must maintain these and other records as part of the daily operational record (25 Pa. Code 299.219). If the transporter is unable to provide this information, the residual wastes shall not be accepted by the permittee until such time as the transporter is able to provide the required information.

(ii) The following conditions apply to the characterization of residual wastes received by the permitted treatment facility:

(1) The permitted facility must receive and maintain on file a characterization of the residual wastes it receives from the generator, as required by 25 Pa. Code 287.54. The characterization shall conform to the Bureau of Waste Management's Form 26R except as noted in paragraph (2), below. Each load of residual waste received must be characterized accordingly.

(2) For wastewater generated from hydraulic fracturing operations ("frac wastewater") within the first 30 production days of a well site, the characterization may be a general frac wastewater characterization approved by DEP. Thereafter, the characterization must be waste-specific and reported on the Form 26R.

b. Receipt of Municipal Waste

(i) The permittee shall document the receipt of all hauled-in municipal wastes (including but not limited to septage and liquid sewage sludge) received for processing at the treatment facility. The permittee shall report hauled-in municipal wastes on a monthly basis to DEP on the "Hauled In Municipal Wastes" Supplemental Report (3800-FM-BPNPSM0437) as an attachment to the DMR. If no municipal wastes were received during a month, submission of the Supplemental Report is not required.

The following information is required by the Supplemental Report:

(1) The dates that municipal wastes were received.

(2) The volume (gallons) of wastes received.

(3) The BOD_5 concentration (mg/l) and load (lbs) for the wastes received.

(4) The location(s) where wastes were disposed of within the treatment facility.

(ii) Sampling and analysis of hauled-in municipal wastes must be completed to characterize the organic strength of the wastes, unless composite sampling of influent wastewater is performed at a location downstream of the point of entry for the wastes. The influent BOD_5 characterization for the treatment facility, as reported in the annual Municipal Wasteload Management Report per 25 Pa. Code Chapter 94, must be representative of the hauled-in municipal wastes received.

4. Unanticipated Noncompliance or Potential Pollution Reporting

a. Immediate Reporting - The permittee shall immediately report any incident causing or threatening pollution in accordance with the requirements of 25 Pa. Code Sections 91.33 and 92a.41(b).

(i) If, because of an accident, other activity or incident a toxic substance or another substance which would endanger users downstream from the discharge, or would otherwise result in pollution or create a danger of pollution or would damage property, the permittee shall immediately notify DEP by telephone of the location and nature of the danger. Oral notification to the Department is required as soon as possible, but no later than 4 hours after the permittee becomes aware of the incident causing or threatening pollution.

(ii) If reasonably possible to do so, the permittee shall immediately notify downstream users of the waters of the Commonwealth to which the substance was discharged. Such notice shall include the location and nature of the danger.

(iii) The permittee shall immediately take or cause to be taken steps necessary to prevent injury to property and downstream users of the waters from pollution or a danger of pollution and, in addition, within 15 days from the incident, shall remove the residual substances contained thereon or therein from the ground and from the affected waters of this Commonwealth to the extent required by applicable law.

b. The permittee shall report any noncompliance which may endanger health or the environment in accordance with the requirements of 40 CFR 122.41(l)(6). These requirements include the following obligations:

(i) 24 Hour Reporting - The permittee shall orally report any noncompliance with this permit which may endanger health or the environment within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which must be reported within 24 hours under this paragraph (40 CFR 122.41(l)(6)(ii)):

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit;

(2) Any upset which exceeds any effluent limitation in the permit; and

(3) Violation of the maximum daily discharge limitation for any of the pollutants listed in the permit as being subject to the 24-hour reporting requirement.

(ii) Written Report - A written submission shall also be provided within 5 days of the time the permittee becomes aware of any noncompliance which may endanger health or the environment. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(iii) Waiver of Written Report - DEP may waive the written report on a case-by-case basis if the associated oral report has been received within 24 hours from the time the permittee becomes aware of the circumstances which may endanger health or the environment. Unless such a waiver is expressly granted by DEP, the permittee shall submit a written report in accordance with this paragraph. (40 CFR 122.41(l)(6)(iii))

5. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under paragraph C.4 of this section or specific requirements of compliance schedules, at the time DMRs are submitted, on the Non-Compliance Reporting Form (3800-FM-BPNPSM0440). The reports shall contain the information listed in paragraph C.4.b.(ii) of this section. (40 CFR 122.41(l)(7))

PART B

I. MANAGEMENT REQUIREMENTS

A. Compliance Schedules (25 Pa. Code 92a.51, 40 CFR 122.47(a))

1. The permittee shall achieve compliance with the terms and conditions of this permit within the time frames specified in this permit.

2. The permittee shall submit reports of compliance or noncompliance, or progress reports as applicable, for any interim and final requirements contained in this permit. Such reports shall be submitted no later than 14 days following the applicable schedule date or compliance deadline. (40 CFR 122.47(a)(4))

B. Permit Modification, Termination, or Revocation and Reissuance

1. This permit may be modified, terminated, or revoked and reissued during its term in accordance with 25 Pa. Code 92a.72 and 40 CFR 122.41(f).

2. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. (40 CFR 122.41(f))

3. In the absence of DEP action to modify or revoke and reissue this permit, the permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time specified in the regulations that establish those standards or prohibitions. (40 CFR 122.41(a)(1))

C. Duty to Provide Information

1. The permittee shall furnish to DEP, within a reasonable time, any information which DEP may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. (40 CFR 122.41(h))

2. The permittee shall furnish to DEP, upon request, copies of records required to be kept by this permit. (40 CFR 122.41(h))

3. Other Information - Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to DEP, it shall promptly submit the correct and complete facts or information. (40 CFR 122.41(l)(8))

4. The permittee shall provide the following information in the annual Municipal Wasteload Management Report, required under the provisions of Title 25 Pa. Code Chapter 94:

   a. The requirements identified in 25 Pa. Code 94.12.

   b. The identity of any indirect discharger(s) served by the POTW which are subject to pretreatment standards adopted under Section 307(b) of the Clean Water Act; the POTW shall also specify the total volume of discharge and estimated concentration of each pollutant discharged into the POTW by the indirect discharger.

   c. A "Solids Management Inventory" if specified in Part C of this permit.

   d. The total volume of hauled-in residual and municipal wastes received during the year, by source.

   e. The Annual Report requirements for permittees required to implement an industrial pretreatment program listed in Part C, as applicable.

D. General Pretreatment Requirements

1. Any POTW (or combination of POTWs operated by the same authority) with a total design flow greater than 5 million gallons per day (MGD) and receiving from industrial users pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to Pretreatment Standards will be required to establish a POTW Pretreatment Program unless specifically exempted by the Approval Authority. A POTW with a design flow of 5 MGD or less may be required to develop a POTW Pretreatment Program if the Approval Authority finds that the nature or volume of the industrial influent, treatment process upsets, violations of effluent limitations, contamination of sludge, or other circumstances warrant in order to prevent interference or pass through. (40 CFR 403.8)

2. Each POTW with an approved Pretreatment Program pursuant to 40 CFR 403.8 shall develop and enforce specific limits to implement the prohibitions listed in 40 CFR 403.5(a)(1) and (b), and shall continue to develop these limits as necessary and effectively enforce such limits. This condition applies, for example, when there are planned changes to the waste stream as identified in Part A III.C.2. If the permittee is required to develop or continue implementation of a Pretreatment Program, detailed requirements will be contained in Part C of this permit.

3. For all POTWs, where pollutants contributed by indirect dischargers result in interference or pass through, and a violation is likely to recur, the permittee shall develop and enforce specific limits for indirect dischargers and other users, as appropriate, that together with appropriate facility or operational changes, are necessary to ensure renewed or continued compliance with this permit or sludge use or disposal practices. Where POTWs do not have an approved Pretreatment Program, the permittee shall submit a copy of such limits to DEP when developed. (25 Pa. Code 92a.47(d))

E. Proper Operation and Maintenance

1. The permittee shall employ operators certified in compliance with the Water and Wastewater Systems Operators Certification Act (63 P.S. §§1001-1015.1).

2. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes, but is not limited to, adequate laboratory controls including appropriate quality assurance procedures. This provision also includes the operation of backup or auxiliary facilities or similar systems that are installed by the permittee, only when necessary to achieve compliance with the terms and conditions of this permit. (40 CFR 122.41(e))

F. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge, sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. (40 CFR 122.41(d))

G. Bypassing

1. Bypassing Not Exceeding Permit Limitations - The permittee may allow a bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions in paragraphs two, three and four of this section. (40 CFR 122.41(m)(2))

2. Other Bypassing - In all other situations, bypassing is prohibited and DEP may take enforcement action against the permittee for bypass unless:

   a. A bypass is unavoidable to prevent loss of life, personal injury or "severe property damage." (40 CFR 122.41(m)(4)(i)(A))

   b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise

of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance. (40 CFR 122.41(m)(4)(i)(B))

c. The permittee submitted the necessary notice required in paragraph G.4 below. (40 CFR 122.41(m) (4)(i)(C))

3. DEP may approve an anticipated bypass, after considering its adverse effects, if DEP determines that it will meet the conditions listed in paragraph G.2 above. (40 CFR 122.41(m)(4)(ii))

4. Notice

a. Anticipated Bypass – If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible, at least 10 days before the bypass. (40 CFR 122.41(m)(3)(i))

b. Unanticipated Bypass – The permittee shall submit oral notice of any other unanticipated bypass within 24 hours, regardless of whether the bypass may endanger health or the environment or whether the bypass exceeds effluent limitations. The notice shall be in accordance with Part A III.C.4.b.

H. Sanitary Sewer Overflows (SSOs)

An SSO is an overflow of wastewater, or other untreated discharge from a separate sanitary sewer system (which is not a combined sewer system), which results from a flow in excess of the carrying capacity of the system or from some other cause prior to reaching the headworks of the sewage treatment facility. SSOs are not authorized under this permit. The permittee shall immediately report any SSO to DEP in accordance with Part A III.C.4 of this permit.

II. PENALTIES AND LIABILITY

A. Violations of Permit Conditions

Any person violating Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act or any permit condition or limitation implementing such sections in a permit issued under Section 402 of the Act is subject to civil, administrative and/or criminal penalties as set forth in 40 CFR §122.4l(a)(2).

Any person or municipality, who violates any provision of this permit; any rule, regulation or order of DEP; or any condition or limitation of any permit issued pursuant to the Clean Streams Law, is subject to criminal and/or civil penalties as set forth in Sections 602, 603 and 605 of the Clean Streams Law.

B. Falsifying Information

Any person who does any of the following:

- Falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit, or

- Knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit (including monitoring reports or reports of compliance or noncompliance)

Shall, upon conviction, be punished by a fine and/or imprisonment as set forth in *18 Pa.C.S.A § 4904* and 40 CFR §122.41(j)(5) and (k)(2).

C. Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance pursuant to Section 309 of the Clean Water Act or Sections 602, 603 or 605 of the Clean Streams Law.

Nothing in this permit shall be construed to preclude the institution of any legal action or to relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject to under the Clean Water Act and the Clean Streams Law.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. 40 CFR 122.41(c)

III. OTHER RESPONSIBILITIES

A. Right of Entry

Pursuant to Sections 5(b) and 305 of Pennsylvania's Clean Streams Law, and Title 25 Pa. Code Chapter 92a and 40 CFR §122.41(i), the permittee shall allow authorized representatives of DEP and EPA, upon the presentation of credentials and other documents as may be required by law:

1. To enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; (40 CFR 122.41(i)(1))

2. To have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; (40 CFR 122.41(i)(2))

3. To inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and (40 CFR 122.41(i)(3))

4. To sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act or the Clean Streams Law, any substances or parameters at any location. (40 CFR 122.41(i)(4))

B. Transfer of Permits

1. Transfers by modification. Except as provided in paragraph 2 of this section, a permit may be transferred by the permittee to a new owner or operator only if this permit has been modified or revoked and reissued, or a minor modification made to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (40 CFR 122.61(a))

2. Automatic transfers. As an alternative to transfers under paragraph 1 of this section, any NPDES permit may be automatically transferred to a new permittee if:

   a. The current permittee notifies DEP at least 30 days in advance of the proposed transfer date in paragraph 2.b. of this section; (40 CFR 122.61(b)(1))

   b. The notice includes the appropriate DEP transfer form signed by the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between them; and (40 CFR 122.61(b)(2))

   c. DEP does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue this permit, the transfer is effective on the date specified in the agreement mentioned in paragraph 2.b. of this section. (40 CFR 122.61(b)(3))

   d. The new permittee is in compliance with existing DEP issued permits, regulations, orders and schedules of compliance, or has demonstrated that any noncompliance with the existing permits has been resolved by an appropriate compliance action or by the terms and conditions of the permit (including compliance schedules set forth in the permit), consistent with 25 Pa. Code 92a.51 (relating to schedules of compliance) and other appropriate Department regulations. (25 Pa. Code 92a.71)

3. In the event DEP does not approve transfer of this permit, the new owner or operator must submit a new permit application.

C. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege. (40 CFR 122.41(g))

D. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for a new permit. (40 CFR 122.41(b))

E. Other Laws

The issuance of this permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations.

IV. ANNUAL FEE

Permittees shall pay an annual fee in accordance with 25 Pa. Code § 92a.62. Annual fee amounts are specified in the following schedule and are due on each anniversary of the effective date of the most recent new or reissued permit. All flows identified in the schedule are annual average design flows. (25 Pa. Code 92a.62)

Small Flow Treatment Facility (SRSTP and SFTF)	$0
Minor Sewage Facility < 0.05 MGD (million gallons per day)	$250
Minor Sewage Facility ≥ 0.05 and < 1 MGD	$500
Minor Sewage Facility with CSO (Combined Sewer Overflow)	$750
Major Sewage Facility ≥ 1 and < 5 MGD	$1,250
Major Sewage Facility ≥ 5 MGD	$2,500
Major Sewage Facility with CSO	$5,000

As of the effective date of this permit, the facility covered by the permit is classified in the following fee category: **Major Sewage Facility >=5 MGD**.

Invoices for annual fees will be mailed to permittees approximately three months prior to the due date. In the event that an invoice is not received, the permittee is nonetheless responsible for payment. Throughout a five year permit term, permittees will pay four annual fees followed by a permit renewal application fee in the last year of permit coverage. Permittees may contact the DEP at 717-787-6744 with questions related to annual fees. The fees identified above are subject to change in accordance with 25 Pa. Code 92a.62(e).

Payment for annual fees shall be remitted to DEP at the address below by the anniversary date. Checks should be made payable to the Commonwealth of Pennsylvania.

PA Department of Environmental Protection
Bureau of Point and Non-Point Source Management
Re: Chapter 92a Annual Fee
P.O. Box 8466
Harrisburg, PA 17105-8466

PART C

I. OTHER REQUIREMENTS

A. No storm water from pavements, area ways, roofs, foundation drains or other sources shall be directly admitted to the sanitary sewers associated with the herein approved discharge.

B. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance or replacement of all sewers or sewerage structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress and regress.

C. Collected screenings, slurries, sludges, and other solids shall be handled and disposed of in compliance with 25 Pa. Code, Chapters 271, 273, 275, 283, and 285 (related to permits and requirements for landfilling, land application, incineration, and storage of sewage sludge), Federal Regulation 40 CFR 257, Pennsylvania Clean Streams Law, Pennsylvania Solid Waste Management Act of 1980, and the Federal Clean Water Act and its amendments. The permittee is responsible to obtain or assure that contracted agents have all necessary permits and approvals for the handling, storage, transport, and disposal of solid waste materials generated as a result of wastewater treatment.

D. The permittee shall optimize chlorine dosages used for disinfection or other purposes to minimize the concentration of Total Residual Chlorine (TRC) in the effluent, meet applicable effluent limitations, and reduce the possibility of adversely affecting the receiving waters. Optimization efforts may include an evaluation of wastewater characteristics, mixing characteristics, and contact times, adjustments to process controls, and maintenance of the disinfection facilities. If DEP determines that effluent TRC is causing adverse water quality impacts, DEP may reopen this permit to apply new or more stringent effluent limitations and/or require implementation of control measures or operational practices to eliminate such impacts.

   Where the permittee does not use chlorine for primary or backup disinfection, but proposes the use of chlorine for cleaning or other purposes, the permittee shall notify DEP prior to initiating use of chlorine and monitor TRC concentrations in the effluent on each day in which chlorine is used. The results shall be submitted as an attachment to the DMR.

E. Notification of the designation of the responsible operator must be submitted to the permitting agency by the permittee within 60 days after the effective date of the permit and from time to time thereafter as the operator is replaced.

F. The seasonal effluent limitations for fecal coliform are based on Chapter 92a (§ 92a.47(a)(4)) of DEP's regulations and Delaware River Basin Commission's (DRBC's) Water Quality Regulations at § 4.30.4.A. DEP's regulations govern the summer limits for fecal coliform while the winter limits are based on DRBC's regulations. The DRBC regulations state that during the winter season from October through April, the instantaneous maximum concentration of fecal coliform organisms shall not be greater than 1,000 per 100 millimeters in more than 10 percent of the samples tested. For reporting purposes, a copy of the guidelines on the 10 percent rule is enclosed with the permit.

G. For reporting purposes on the DMR, the term "average weekly" shall mean the highest average weekly value observed during the monthly monitoring period.

H. If, at any time, the DEP determines that the discharge permitted herein creates a public nuisance or causes environmental harm to the receiving water of the Commonwealth, the DEP may require the permittee to adopt such remedial measures as will produce a satisfactory effluent. If the permittee fails to adopt such remedial measures within the time specified by the DEP, the right to discharge herein granted shall, upon notice by the DEP, cease and become null and void.

I. If there is a change in ownership of this facility or in permittee name, an application for treansfer of permit must be submitted to the DEP.

J. Analysis for the following pollutant(s) shall be performed using the following test method(s) contained in 40 C.F.R. Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants, or any approved test method(s) of equal or greater sensitivity:

Parameter	Test Method
Copper, Total	220.2 (AA, Furnace)
Mercury, Total	1631 (Cold Vapor, Atomic Fluor)
Zinc, Total	200.7 (ICP)
Aluminum, Total	202.2 (AA, Furnace)
Benzidine	605 - HPLC

K. The DEP may identify and require certain discharge specific data to be submitted before the expiration date of this permit. Upon notification by the DEP, the permittee will have 12 months from the date of the notice to provide the required data. These data, along with any other data available to the DEP, will be used in completing the Watershed TMDL/WLA Analysis and in establishing discharge effluent limits. In the event that DEP requires the submission of data pursuant to this condition, the permittee shall have the right to appeal or otherwise contest the requirement.

L. The permittee shall submit the results of acute whole effluent toxicity testing with their next NPDES application, according to 40 C.F.R. 122.21(j)(5). The permittee shall submit the results of a minimum of four quarterly tests, from the year preceding the submission of the application. The permittee shall obtain the appropriate biomonitoring protocol for the testing from the DEP's Regional Office. The dilution series for the testing shall be 100, 50, 12.5, and 6.25 percent, unless modified in writing by the DEP.

M. The facility shall be operated under the charge of a responsible operator(s) certified under the Pennsylvania Water and Wastewater Systems Operations Certification Act (Act 11). The operator(s) shall comply with the continuing education requirements required under the regulations and guidelines related to Act 11.

N. Instantaneous maximum limitations are imposed to allow for a grab sample to be collected by the appropriate regulatory agency to determine compliance. The permittee does not have to monitor for the instantaneous maximum limitation except for the parameters pH, total residual chlorine, and fecal coliform. However, if grab samples are collected for parameters normally monitored through composite sampling, the results must be reported.

O. The Environmental Laboratory Accreditation Act of 2002 requires that all environmental laboratories register with the DEP. An environmental laboratory is any facility engaged in the testing or analysis of environmental samples required by a statute administered by the DEP relating to the protection of the environment or of public health, safety, and welfare.

P. The Total Dissolved Solids maximum daily effluent limitation shall not exceed 3,000 mg/l or 200,290 lbs/day during months when the average monthly effluent flow is less than or equal to 8.935 million gallons per day. The Total Dissolved Solids maximum daily effluent limitation shall not exceed 2,238 mg/l or 240,000 lbs/day during months when the average monthly effluent flow exceeds 8.935 million gallons per day. These limits are based on DRBC Docket No. D-1989-055-CP-2, dated July 14, 2010. Decision Condition II.i. of the Docket requires the Authority to perform two ecological studies that include macro-invertebrate sampling and instream monitoring for conductivity and osmotic pressure. Copies of the studies shall be submitted to DEP with the next NPDES permit renewal application.

Q. There shall be no discharge of polychlorinated biphenyl (PCB) compounds such as those commonly used for transformer fluid at any time.

R. The permittee shall develop a treatment facility operations and maintenance (O&M) plan addressing key wastewater processes. The plan shall be reviewed annually and updated when appropriate. The plan shall be submitted to DEP for review upon request. For the purpose of this paragraph, a key wastewater process includes any equipment or process that, if it fails, may cause the discharge of raw wastewater or

wastewater that fails to meet NPDES permit discharge requirements, or a failure that may threaten human or environmental health. The O&M plan shall include the following, at a minimum:

1. A process control strategy that includes a schedule for process control sampling, monitoring, testing, and recordkeeping.

2. A plan that identifies how key wastewater processes shall be monitored and adjusted while the facility is staffed.

3. A plan that identifies how key wastewater processes will be monitored while the treatment facility is not staffed.

4. For treatment plants that are impacted by wet weather flows, the permittee shall develop and implement a wet weather operations strategy that minimizes or eliminates the wash out of solids from the treatment system while maximizing the flow through the treatment plant.

5. An emergency plan that identifies how the facility will be operated during times of emergency. For example, the plan shall detail how key wastewater processes will be repaired or replaced in the event of a failure while minimizing loss of life and property damage to the facility. This plan shall also include emergency contact numbers for local emergency response agencies, plant personnel, critical suppliers and vendors, and DEP contacts, at a minimum.

6. A preventative maintenance plan that includes a schedule for preventative maintenance for all equipment within the treatment system. A spare parts inventory shall be included as part of this plan.

7. A solids management plan that identifies how solids produced by the facility will be wasted, treated, and ultimately disposed of.

II. POTW PRETREATMENT PROGRAM IMPLEMENTATION

A. General Requirement – The permittee shall operate and implement a POTW pretreatment program in accordance with the federal Clean Water Act, the Pennsylvania Clean Streams Law, and the federal General Pretreatment Regulations at 40 CFR Part 403. The program shall also be implemented in accordance with the permittee's approved pretreatment program and any modifications thereto submitted by the permittee and approved by the Approval Authority.

B. Annual Report and Other Requirements – The permittee shall submit a Pretreatment Annual Report by March 31 of each year to EPA that describes the permittee's pretreatment activities for the previous calendar year. The Pretreatment Annual Report shall include a description of pretreatment activities in all municipalities from which wastewater is received at the permittee's POTW. The Pretreatment Annual Report shall include the following information, at minimum:

1. Industrial Listing – The Annual Report shall contain an updated industrial listing providing the names and addresses of all current Significant Industrial Users (SIUs) and Non-Significant Categorical Industrial Users (NSCIUs), as defined in 40 CFR 403.3, and the categorical standard, if any, applicable to each. The listing must: (1) identify any users that are subject to reduced reporting requirements under 40 CFR 403.12(e)(3); (2) identify which users are NSCIUs; (3) identify any users that have been granted a monitoring waiver in accordance with 40 CFR 403.12(e)(2) as well as the pollutants for which the waiver was granted and the date of the last POTW sampling event for each pollutant; and (4) identify any categorical industrial users that have been given mass-based limits in place of concentration-based categorical limits in accordance with 40 CFR 403.6(c)(5) or concentration-based limits in place of mass-based categorical limits in accordance with 40 CFR 403.6(c)(6).

   In addition, the Annual Report shall contain a summary of any hauled-in wastes accepted at the POTW including the source of the wastes (domestic, commercial or industrial) and the receiving location for acceptance of the wastes. For each industrial source (whether or not classified as an SIU), the report shall indicate (1) the name and address of the industrial source; (2) the average daily amount of wastewater received; (3) a brief description of the type of process operations conducted at the industrial facility; (4) whether the source facility is a categorical industrial user (including NSCIU), significant industrial users, or non-significant industrial user; and (5) any controls imposed on the user.

2. Control Mechanism Issuance – The Annual Report shall contain a summary of SIU control mechanism issuance, including a list of issuance, effective, and expiration dates for each SIU control mechanism. For each general control mechanism issued, provide the names of all SIUs covered by the general control mechanism and an explanation of how the users meet the criteria of 40 CFR 403.8(f)(1)(iii)(A) for issuance of a general control mechanism.

3. Sampling and Inspection – The Annual Report shall contain a summary of the number and types of inspections and sampling events of SIUs by the permittee, including a list of all SIUs either not sampled or not inspected, and the reason that the sampling and/or inspection was not conducted. For any user subject to reduced reporting under 40 CFR 403.12(e)(3), the list shall include the date of the last POTW sampling event and the date of the last POTW inspection of the user. In addition, the report shall include a summary of the number of self-monitoring events conducted by each SIU and the number required to be conducted, including a list of all SIUs that did not submit the required number of reports and the reason why the reports were not submitted. For NSCIUs, the report shall provide the date of the compliance certification required under 40 CFR 403.12(q).

4. Industrial User Compliance and POTW Enforcement – The Annual Report shall contain a summary of the number and type of violations of pretreatment standards and requirements, including local limits, and the actions taken by the permittee to obtain compliance, including compliance schedules, penalty assessments and actions for injunctive relief. The report shall state whether each SIU was in significant noncompliance, as that term is defined in 40 CFR Section 403.8(f)(2)(viii), and include the parameter(s) in violation, the period of violation, the actions taken by the POTW in response to the violations, and the compliance status at the end of the reporting period. A copy of the publication of users meeting the significant noncompliance criteria shall be included. In addition, the report shall provide a list of users previously designated as NSCIUs that have violated (to any extent) any pretreatment standard or requirement during the year and the date and description of the violation(s).

5. Summary of POTW Operations – The Annual Report shall contain a summary of any interference, pass-through, or permit violations by the POTW and indicate the following: (1) which, if any, permit violations may be attributed to industrial users; (2) which IU(s) are responsible for such violations; and (3) the actions taken to address these events. The report shall also include all sampling and analysis of POTW treatment plant influent, effluent, and sludge conducted during the year for local limit and priority pollutants identified pursuant to Section 303(d) of the Clean Water Act, 33 U.S.C. 1313(d).

6. Pretreatment Program Changes – The Annual Report shall contain a summary of any changes made or proposed to the approved program during the period covered by the report and the date of submission to the Approval Authority.

A summary of pretreatment activities shall be incorporated into the permittee's Annual Municipal Wasteload Management Report required by 25 Pa. Code Chapter 94 and referenced in Part B I.C.4 of this permit.

C. Routine Monitoring – The permittee shall conduct monitoring at its treatment plant that, at a minimum, includes quarterly influent, effluent, and sludge analysis for all pollutants for which local limits have been established, and an annual priority pollutant scan for influent and sludge.

D. Notification of Pass Through or Interference – The permittee shall notify EPA and DEP, in writing, of any instance of pass through or interference, as defined at 40 CFR 403.3(p) and (k), respectively, known or suspected to be related to a discharge from an IU into the POTW. The notification shall be attached to the DMR submitted to EPA and DEP and shall describe the incident, including the date, time, length, cause (including responsible user if known), and the steps taken by the permittee and IU (if identified) to address the incident. A copy of the notification shall also be sent to the EPA at the address provided below.

E. Headworks Analysis – The permittee shall submit to EPA a reevaluation of its local limits based on a headworks analysis of its treatment plant within one (1) year of permit issuance, and provide a revised submission within three (3) months of receipt of comments from EPA unless a longer period of time is granted in writing by EPA. In order to ensure that the permittee's discharge complies with water quality standards, the reevaluation of local limits shall consider, at a minimum, all water quality standards under 25 Pa. Code Chapter 93 applicable to the pollutants included in the reevaluation, unless the POTW is

subject to an effluent limitation for the pollutant in Part A of this permit. The list of pollutants to be evaluated, as well as a sampling plan for collection of necessary data, shall be submitted to EPA within three (3) months of permit issuance. Unless otherwise approved in writing, the list of pollutants shall include arsenic, cadmium, chromium, copper, cyanide, lead, mercury, molybdenum, nickel, selenium, silver, zinc, BOD_5, TSS, ammonia, any pollutants for which a local limit currently exists, any pollutant limited in this permit, as well as any other pollutants that have been identified in the POTW in significant quantities through monitoring or the receipt of indirect discharges and hauled-in wastes. For example, facilities receiving residual waste from oil and gas operations should include pollutants such as Total Dissolved Solids (TDS), specific ions such as chlorides and sulfates, specific radionuclides, metals such as barium and strontium, and other pollutants that could reasonably be expected to be present. Within four (4) months of acceptance of the headworks analysis by the Approval Authority, the permittee shall adopt the revised local limits and, if necessary to ensure that the limits are enforceable throughout the service area, notify all contributing municipalities of the need to adopt the revised local limits.

F. Changes to Pretreatment Program – EPA and DEP may require the permittee to submit for approval changes to its pretreatment program if any one or more of the following conditions is present:

1. The program is not implemented in accordance with 40 CFR Part 403;

2. Problems such as interference, pass through or sludge contamination develop or continue;

3. The POTW proposes to introduce new pollutants or an increased loading of approved pollutants as described in Part A III.C.2 of this permit;

4. Federal, State, or local requirements change;

5. Changes are needed to assure protection of waters of the Commonwealth.

Program modification is necessary whenever there is a significant change in the operation of the pretreatment program that differs from the information contained in the permittee's submission, as approved under 40 CFR 403.11.

G. Procedure for Pretreatment Program Changes – Upon submittal by the permittee, and written notice of approval by the Approval Authority to the permittee of any changes to the permittee's approved pretreatment program, such changes are effective and binding upon the permittee unless the permittee objects within 30 days of receipt of the written notice of approval. Any objection must be submitted in writing to EPA and DEP.

H. Correspondence – The Approval Authority shall be EPA at the following address:

Pretreatment Coordinator (3WP41)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Copies of all correspondence and reports dealing with this program shall be sent to:

Department of Environmental Protection
Southeast Regional Office
Clean Water Program
2 East Main Street
Norristown, PA 19401

III. REQUIREMENTS APPLICABLE TO STORMWATER OUTFALLS

A. Prohibition of Nonstormwater Discharges

1. Except as provided in A.2, all discharges to stormwater Outfall 002 shall be composed entirely of stormwater and allowable nonstormwater as specified in A.2 below.

2. The following nonstormwater discharges may be authorized, provided the discharge is in compliance with D.2.b: discharges from fire fighting activities; fire hydrant flushings, potable water sources, including waterline flushings, irrigation drainage, lawn watering, routine external building washdown which does not use detergents or other compounds, pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used, air conditioning condensate, springs, uncontaminated groundwater, and foundation or footing drains where flows are not contaminated with process materials such as solvents.

B. Spills

This permit does not authorize the discharge of any polluting substances resulting from an on-site spill. Such spills shall be controlled through proper implementation of a Preparedness, Prevention, and Contingency (PPC) Plan as stated in Section D below.

C. This permit does not authorize any discharge (stormwater or nonstormwater) containing any pollutant that may cause or contribute to an impact on aquatic life or pose a substantial hazard to human health or the environment due to its quantity or concentration.

D. Preparedness, Prevention, and Contingency Plans

1. Development of Plan

Operators of facilities shall have developed a PPC Plan in accordance with 25 Pa. Code Section 91.34 and the "Guidelines for the Development and Implementation of Environmental Emergency Response Plans." The PPC Plan shall identify potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the facility. In addition, the PPC Plan shall describe the BMPs that are to be used to reduce the pollutants in stormwater discharges at the facility ensuring compliance with the terms and conditions of this permit. The PPC Plan shall be completed within 90 days from the permit effective date.

2. Nonstormwater Discharges

a. The PPC Plan shall contain a certification that the discharge has been tested or evaluated for the presence of nonstormwater discharges. The certification shall include the identification of potential significant sources of nonstormwater at the site, a description of the results of any test and/or evaluation for the presence of nonstormwater discharges, the evaluation criteria or testing methods used, the date of any testing and/or evaluation, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the stormwater discharge does not have access to an outfall, manhole, or other point of access to the ultimate conduit that receives the discharge. In such cases, the source identification section of the PPC Plan shall indicate why the certification was not feasible. A discharger that is unable to provide the certification must notify the DEP within 90 days of the effective date of this permit.

b. Except for flows from fire fighting activities, sources of nonstormwater listed in A.2. (authorized nonstormwater discharges) that are combined with stormwater discharges must be identified in the Plan. The Plan shall identify and ensure the implementation of appropriate pollution prevention measures for the nonstormwater component(s) of the discharge.

3. Special Requirements for SARA Title III, Section 313 Facilities

a. Facilities subject to SARA Title III, Section 313 shall include in the PPC Plan a description of releases to land or water of Section 313 water priority chemicals that have occurred within the last three years. Each of the following shall be evaluated for the reasonable potential for contributing pollutants to runoff: loading and unloading operations, outdoor storage activities, outdoor manufacturing or processing activities, significant dust or particulate generating process, and on-site waste disposal practices. Factors to consider include the toxicity of chemicals; quantity of chemicals used, produced or discharged; the likelihood of contact with stormwater; and history of significant leaks or spills of toxic or hazardous pollutants.

b. Engineering Certification. No stormwater PPC Plan for facilities subject to SARA Title III, Section 313 requirements for chemicals that are classified as "Section 313 water priority chemicals" shall be effective unless it has been reviewed by a Registered Professional Engineer and certified to by such Professional Engineer. A Registered Professional Engineer shall recertify the PPC Plan every year thereafter. This certification may be combined with the required annual evaluation in D.4. By means of these certifications, the engineer, having examined the facility and being familiar with the provisions of this part, shall attest that the storm water PPC Plan has been prepared in accordance with good engineering practices. Such certification shall in no way relieve the owner or operator of a facility covered by the PPC Plan of the duty to prepare and fully implement such Plan.

4. Comprehensive Site Compliance Evaluations and Recordkeeping

Qualified personnel shall conduct site compliance evaluations at least once a year. Such evaluations shall include:

a. Visual inspection and evaluation of areas contributing to a stormwater discharge for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural stormwater management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the Plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the Plan, such as spill response equipment, shall be made.

b. Based on the results of the inspection, the description of potential pollutant sources identified in the PPC Plan, and pollution prevention measures and controls identified in the Plan shall be revised as appropriate within 15 days of such inspection and shall provide for implementation of any changes to the Plan in a timely manner, but in no case more than 90 days after the inspection.

c. A report summarizing the scope of the inspection, using the DEP's Annual Inspection form shall be completed and made available upon request and retained as part of the PPC Plan for at least one year after coverage under this permit terminates.

E. Stormwater Best Management Practices (BMPs)

The permittee shall implement at least the following BMPs:

- Manage sludge in accordance with all applicable permit requirements; temporarily collect and store sludge in enclosed containers or tanks.
- Store chemicals in secure and covered areas on impervious surfaces away from storm drains.
- For new facilities and improvements: Design wastewater treatment facilities to avoid, to the maximum extent practicable, storm water commingling with sanitary wastewater.
- Efficiently use herbicides for weed control; where practicable, investigate use of the least toxic herbicides; do not apply during windy conditions.
- Do not wash parts or equipment over impervious surfaces that wash into storm drains.
- Conduct Good Housekeeping Practices.
- Implement infiltration techniques, including infiltration basins, trenches, dry wells, porous pavements, etc., wherever practicable.

F. Stormwater Sampling and Reporting

1. If stormwater samples are required by this permit, they shall be collected as grab samples during the first 30 minutes, but no later than one-hour of the discharge resulting from a storm event that occurs at least 72 hours from the previously measurable storm event.

2. When the discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit, in lieu of sampling data, a description of why samples could not be collected, including available documentation of the event. This sampling waiver may not be used more than once during a two-year period.

3. Stormwater monitoring results shall be summarized on a DMR form and the DEP's "Additional Information for the Reporting of Stormwater Monitoring" form.

IV. PCB MONITORING

A. On April 7, 2007, the U.S. Environmental Protection Agency (EPA), Region III, established a Total Maximum Daily Load (TMDL) for Polychlorinated Biphenyl (PCB) for the Schuylkill River, which was listed on Pennsylvania's 1996 303(d) list of impaired streams as impaired due to the presence of elevated PCB concentrations found in fish tissue. PCBs are a group of synthetic chemicals that consist of 209 individual compounds (known as congeners). The Schuylkill River's PCB TMDL was established using a water quality criterion of 0.044 ng/L for PCBs.

B. Implementation of the TMDL requires that permitted facilities that discharge directly to the Schuylkill River conduct monitoring for PCBs using analytical Method 1668A. The results of PCB monitoring will be evaluated to determine a need to develop and implement a PCB Waste Minimization and Reduction Program, also known as Pollution Minimization Plan (PMP). For information on how to develop a PMP visit Delaware River Basin Commission's website at http://www.state.nj.us/drbc/PMP_info.htm.

C. Implementation of the TMDL will be completed in two phases. Phase I implementation of the TMDL requires that this facility collect and analyze two samples for PCBs utilizing Method 1668A during the first 12 months of this permit. Phase II implementation of the TMDL will involve the development and implementation of a PMP based on the PCB monitoring results. This facility is required to collect and analyze two samples for PCBs utilizing Method 1668A within 12 months from the issuance of this permit. One sample shall be collected during a wet weather flow period; the second sample shall be collected during a dry flow period. The samples shall be collected from Outfall 001. Sample collection techniques, identification analytical approaches and reporting requirements can be found at http://www.state.nj.us/drbc/PCB_info.htm.

D. Within 15 months from the issuance of this permit, the facility shall submit the results of the PCB monitoring to DEP at the address listed below. Upon review of the data collected in Phase I, individual facilities will be directed by the DEP to commence Phase II involving development and implementation of a PMP.

PA Department of Environmental Protection
Southeast Regional Office
Water Management Program
Operations Section
2 East Main Street
Norristown, PA 19401

V. REQUIREMENT TO USE EDMR SYSTEM

A. Within 30 days of the Permit Issuance Date, the permittee shall submit the necessary forms to register for the Department's Electronic Discharge Monitoring Report (eDMR) system for the submission of DMRs and Supplemental DMRs. The eDMR system, registration materials and instructions can be accessed at www.dep.state.pa.us/edmr.

B. The registration materials shall be submitted to the DEP's Central Office for processing at the following address:

PA DEP
Bureau of Point and Non-Point Source Management
Rachel Carson State Office Building
P.O. Box 8466
Harrisburg, PA 17105-8466

C. Upon notification from DEP that the permittee and its users are registered to use eDMR, the permittee shall begin using the eDMR system to submit its DMR(s) for the reporting period(s) identified in the DEP's notification. The permittee shall continue to use eDMR for all subsequent reporting periods unless DEP grants written approval to discontinue its use and issues an amendment to this permit.

Appendix O

FIELD SERVICE REPORT			Rep
Completed By:	Mike Krueger Martin Roshong	**Date(s) of Service:**	January 30, 2013
Customer Name:	City of Pottstown, PA	**Site Name:**	Pottstown WWTP
Project #	282983 (200265)	**Address:** **(Street address, City & State)**	1269 Industrial Hwy Pottstown PA 19464
Project Manager:	Fergus Robinson	**Phone Numbers:**	229-227-8705
Personnel Contacted at Job Site:	Brent, Scott and Randy	**Site Contact**	Brent Wagner 610-741-8427
Equipment: **(include description)**	(5) 72" Ø Internalift Pumps	**Site Owner**	City of Pottstown, PA
Unit Designation per Drawing:			
Plant Supervisor	Brent Wagner bwagner@pottstown.org	**Site Phone Number:**	610-970-6540

Service Objective: I was here with Martin to do an inspection of the operation and condition of the five (5) Internalift screw pumps that were installed and started in 1991.

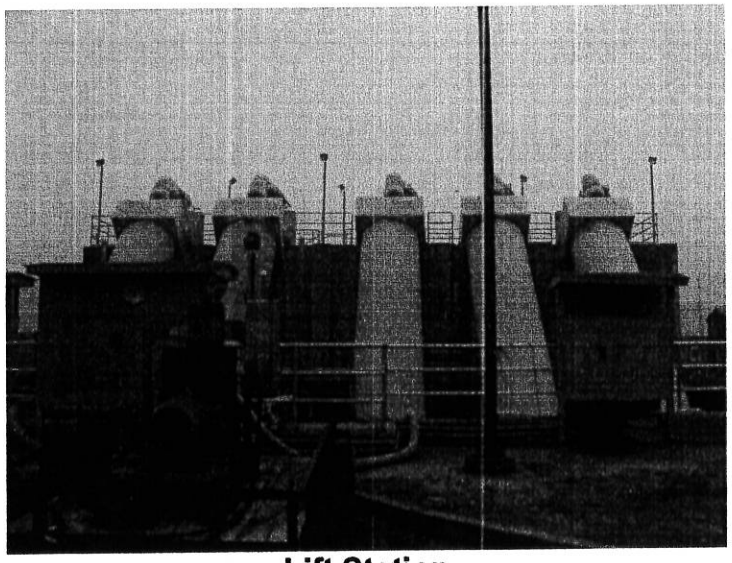
Service Summary: There were some issues with the drive shafts right after the screw pumps were originally started and this was corrected. They have now been operating the screw pumps for approximately 23 years and have had very little troubles in that time. Maintenance is excellent and I would now recommend an inspection of the screws at two year intervals. It has been ten years since the last inspection and at this point I do not see the need for annual inspections due to the good condition of the screws.

Details of Services Performed: I arrived before daylight and stopped at the lift station. There were two screws in operation (typical operating conditions). Screw B and C were running. Screw are labeled as A – B – C – D – E from left to right when standing at the bottom looking up towards the drives. Screws A & B are in one common wetwell and screw C, D, & E are in another common wetwell – there are all side by side at the same elevations.

The drive assembly on screw c was a little bit noisy and it sounded as if it was in the gearbox but the temperature was cool. Scot said that they had probably just stared the screw pump a little while earlier and it was not up to temperature yet. The screws are rotated every 8 hour shift and are usually operated in pairs with the remaining three used as lag/standby.

Screw pump B has a cyclical low pitch "whoomp-whoomp" noise. It was not excessive and certainly not really anything out of the ordinary. When I asked about how long this screw had been making this sound, I was told it has done this for about 10 years. Screw pump B has been "the problem child" since start up but overall, the service from the units has been very satisfactory.

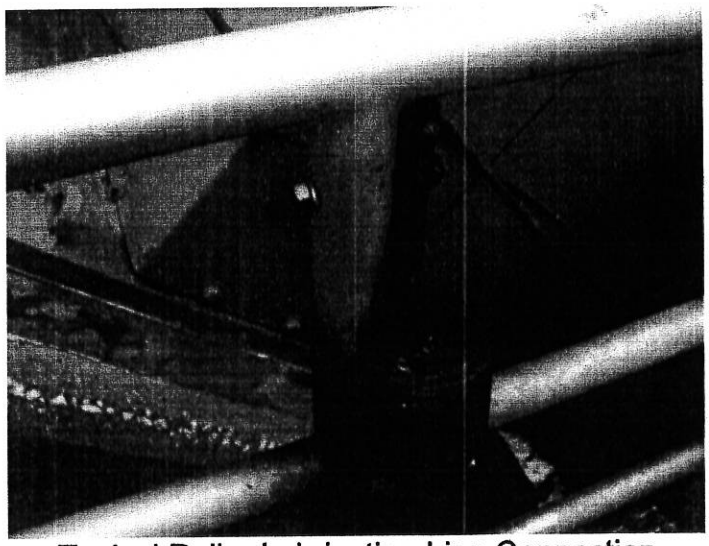
Art Auchenbach with Riordan Materials also came by this morning to gather some information and visit with Brent.



Lift Station

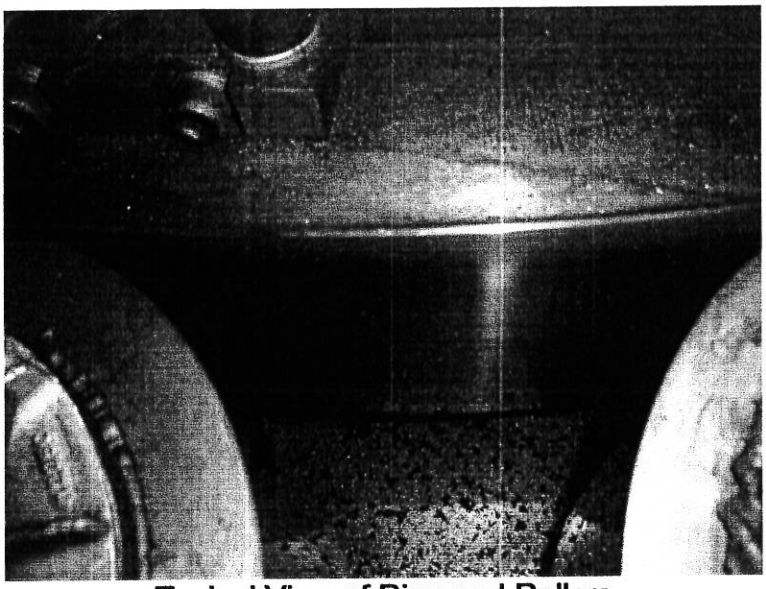
Martin arrived about 8:00 and we spoke with Brent while Scott and Randy were going to begin getting the wetwell for C, D & E pumps pumped down so I could get a look at the inside of these three pumps first. There is a problem with the motor starter on screw pump B, so it will be shut down last. They are expecting heavy rains tonight as well and will likely need to run all 5 pumps tomorrow, so I will make sure that I get all pumps inspected today.

The rollers on C, D, & E were inspected first while the pit was being pumped down. There have been some modifications made over the years to the screws but they have all been for the better. The lower lubrication lines have been changed to flow the grease through the rollers and out to a waste grease catch can. This is similar to what we do now on the new screws in that the relief plugs are no longer inside the lower guards.



Typical Roller Lubrication Line Connection

With the lubrication line like this, the spent grease from the lubrication process will not build up inside the guard, getting on the rollers/ring and causing unnecessary wear. There are no issues with the rollers on any of the screw pump. I looked at all of the rollers and I have never seen any rings/rollers that were in a condition as good as there for the length of service.



Typical View of Ring and Rollers

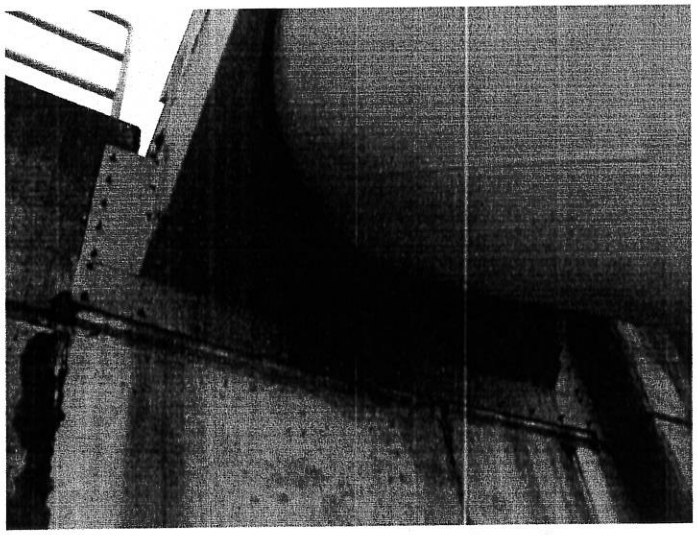
Each set of rollers on each screw has a hinged inspection door that was added by the city. This is what the view of the ring and rollers were like on every pump. I will sent individual photos of all that I took as a separate email, but I just wanted this to be representative of the excellent condition the screw pumps are in today. Scott told me that they use 1 quart of oil per screw per shift. This might be a little bit more that required initially, but based on the condition of these rollers and rings, I told Brent and Scot not to change a thing. They have purchased some parts for the oilers and Scot is going to make a few improvements to the heat trace system they currently have to be able to protect the lines better right at the tops of the lower guards. They are also going to install new gauges. They have a low and high pressure alarm for their oiling system.

The drives all seem to be in good condition as well. Like I mentioned earlier, there is one drive that is a little louder than the others, but then again, it has been operating like this for several years. They have soft starts on the drives but occasionally the screws will still squeal the belts on a fully loaded start. I told Scott that many time I will recommend using a PowerBand on the drives instead of individual belts. This will eliminate the "start up squeal" most of the time.

Synthetic oil is used in the gearboxes and it is filtered and tested every 6 months to determine if it still have the qualities within the manufacturers specifications. I told them that this was very common today but the most gearbox manufacturers recommend changing the oil every five years.

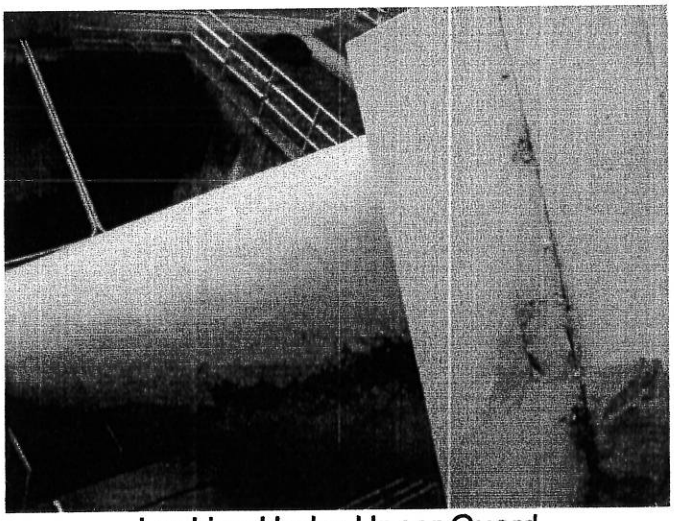
The oil level in the upper bearings was good on all screws and this oil is also changed every 6 months. They have replaced one upper bearing in 23 years.

When the screws were first getting ready to be installed, there was a problem with the lower pedestals being poured incorrectly and they had to be removed and re-poured. The upper opening at the apex was also incorrect and resulted in a larger opening than designed. As a result the upper guards had to be modified to fit and cover the openings. The guards are completely enclosed now and Brent said they were looking at replacing them one at a time with stainless steel guards, but they would get this done locally. MGK Construction is right behind and across the river from the plant and they do quite a bit of work for the city.



Typical Upper Splash Guard

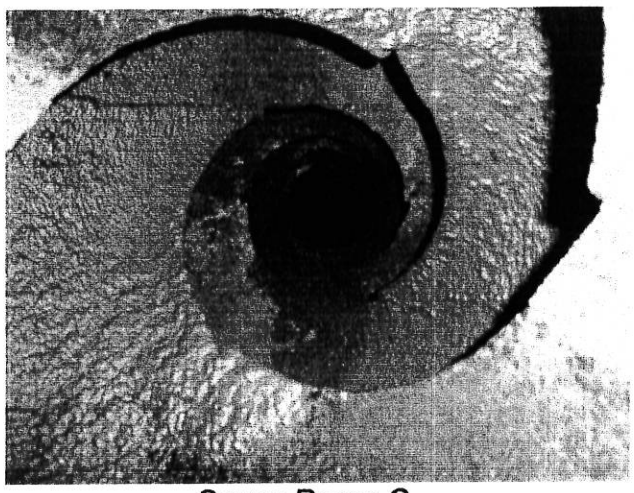
Screw B has a leak at the very top of the screw and is beginning to leak down the pipe. They city will have MGK remove the upper covers from the splash guards and see where the leak originates. The way it appears to me is that there could be deterioration of the upper lip on the screw that is allowing the liquid to fall onto the pipe instead of on the splash guard.



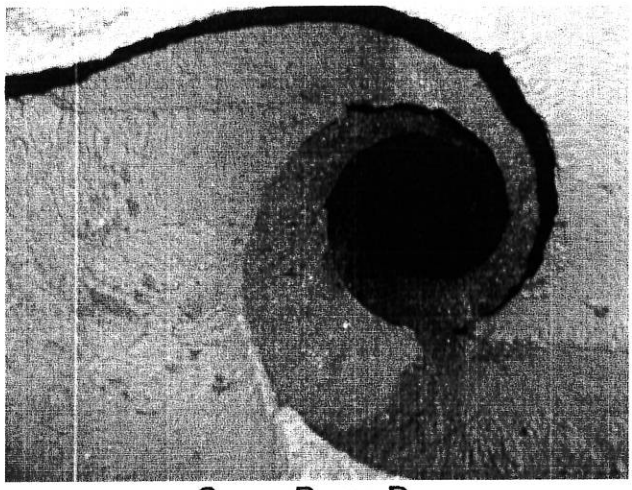
Leaking Under Upper Guard

While I was inspecting the lower ring and rollers on the A and B screws, I found a bolt lying on the floor between the two screws. It looks like a connection bolt from one of the blocks on the screw where the ring is attached. These screws are old enough that the upper connection blocks were also bolted to the pilot block before they were welded in position. Without removing the upper half of the lower guard, we were not able to see where the bolt had some from. When the upper guard is removed to correct the leak, they will also remove the top half of the lower guard is removed Scott said they will look to see if they can find where it came from.

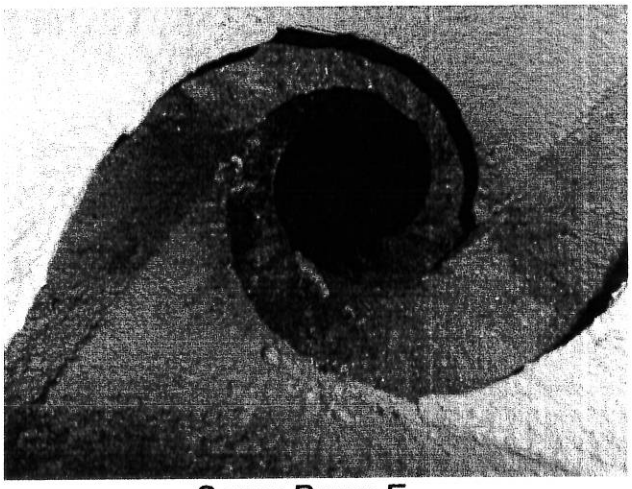
After the pits were pumped down I was able to look up inside each screw pump and get a good look at the leading edge flights and the interior flights at the center core all the way up the screw to the drive shaft. I am please at the condition of all the screws. The coating on these old screws has done a phenomenal job of protection. It is too bad that the EPA has screwed up the components of paint today.



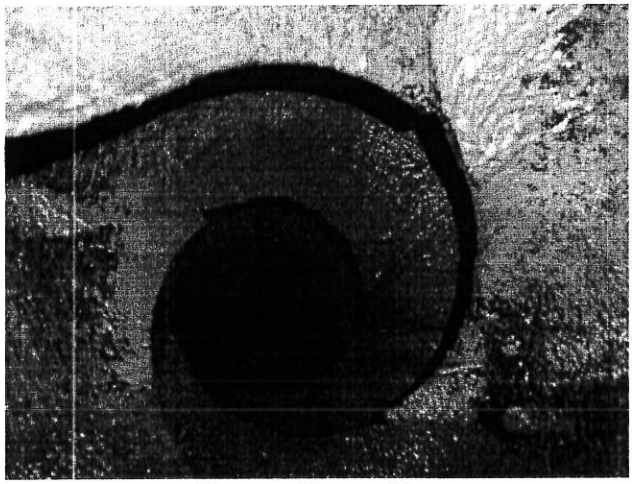
Screw Pump C



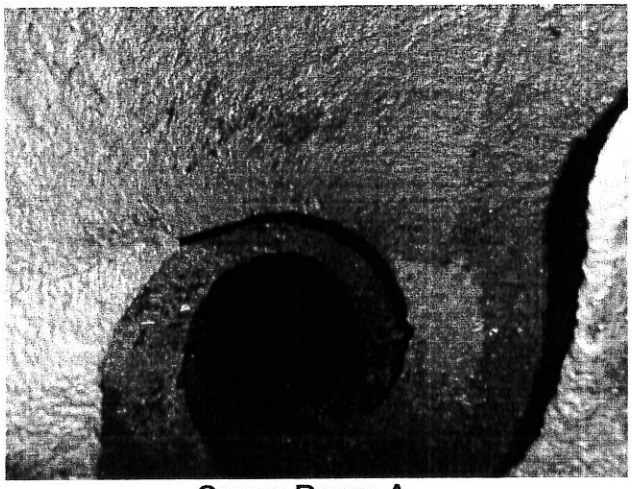
Screw Pump D



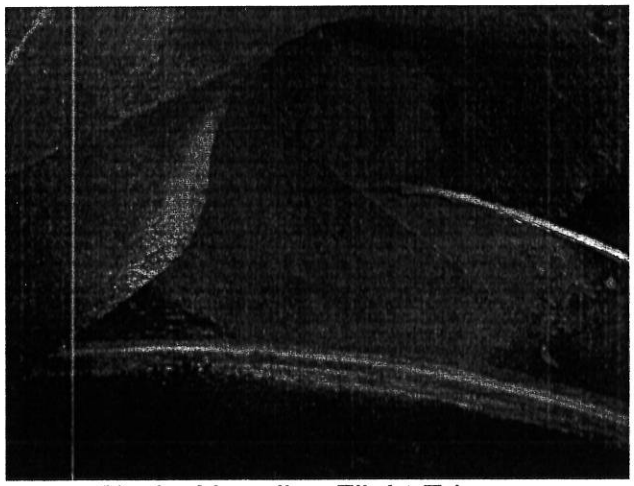
Screw Pump E



Screw Pump B



Screw Pump A



Typical Leading Flight Edges

It is evident from the photos above (taken and displayed in the order I inspected) that the screws look very good on the interior and there are no signs of corrosion, delamination of material or any missing material. While the camera flash will not allow a good shot all the way up to the drive shaft, the LED flashlight that I used allowed me to see all the way up and all the flight connections look just like the ones in the photos.

After the inspection, I asked if I could look at the original O&M manual for the screws and Scott told me that they have not been able to find any of them for the last several years. I told him that I would see if we still had a copy of one at our office, but since these were built long before electronic manuals and after the transfer of engineering from CPC location to Thomasville location, it may be difficult finding the original to make a copy for them. I will ask Fergus and Charles to look and see if we have anything on the old project (Old CPC Order Number: 200265).

Brent and I talked about the operation of the screws and the excellent maintenance that is performed on them. This is evident and this is obviously a plant that has taken a lot of pride in and care of the equipment they have – not just the screws but all of their equipment. It is truly a pleasure going to do an inspection at a plant like this.

Appendix P

Item N°3

Biosolids Plan

With having a Class A and Class B Biosolids permit; we have the options to go to farm grounds, mine reclamation projects, composting facilities, and landfill.

The operations staff shall ensure to dry the sludge with the using the operational manual and training provided to you.

The operational staff shall ensure that the centrifuge is operate at the best available means at all times; follow the operational manual and training provided to you.

The current hauler is Jesse Baro; the operator shall inform the hauler once a dumpster is full.

The determination of using the Class A or Class B permit will be based upon analytical data, plant processes, and weather conditions.

Material Matters (Biosolids Consultant) will assist the plant and Jesse Baro when needed.

Bulk Parameter Criteria

Pottstown Wastewater Treatment Plant

	Wastewater			Sludge
	Permit Limit	Local Limit		Limit
	mg/L	mg/L		(mg/kg)
BOD	250 mg/L			
TSS	250 mg/L			
Ammonia	25 mg/L			
Fecal				
TDS				
pH	5-10 su			
Oil & Grease	100 mg/L			
Free CN	0.56 mg/L			
Total CN		2.1918		
Total Phenols	1.00 mg/L			
TTO	2.13 mg/L			
Total Arsenic		1.2284		41-75
Total Cadmium		0.1425		39-85
Total Chromium		3.905		
Total Copper		3.711		1500-4300
Total Lead		2.2001		300-840
Total Mercury		0.1195		17-57
Total Molybdenum		monitor		75
Total Nickel		3.886		420
Total Selenium		monitor		100
Total Silver		1.2659		
Total Zinc		4.548		2800-7500
PCB		monitor		4-8.6

Borough of Pottstown Wastewater Treatment Plant
Bulk Sewage Program
Hauler List

Hauling Company	Account #	Permit #	Approved for			Contact Name
All American Septic Service, Inc.	2668	091905	H	S	SL	Steve Chieffo
ALL Holding Co., LLC	5439	61713			SL	Donald Countryman
Aqua Wastewater Management	213	5331	H	S	SL	Steve Marchak
Aston Mauger Contracting	3172	052407	H	S	SL	Lori Mauger
B & C Septic Service	2348	110404	H	S		Bob , Cheryl Brooks
Bailey's Septic Service, Inc.	3474	051806		S		Les, Todd, Scott Bailey
Bailey's Inspection Service	5001	50912	H	S		Scott Bailey
Barber Septic Service - Dale	1978	032003	H	S		Dale Barber
Barber Septic Service - Tim	3225	042408	H	S	SL	Tim Barber
Bollinger Septic Service	3155	050207	H	S		Jennifer, Ronald Bollinger
Buckman's Inc.	4337	081110	H			David Bowman
~~BucksMont Environmental~~	~~4584~~	~~22211~~	~~H~~	~~S~~		~~Skip Hess~~
C.F. Heckman & Sons Inc.	215	8002	H	S	SL	B. Scott Landis
Clemens Septic Service	2958	041106	H	S		Dwight Woelkers
Cook's Disposal	3072	120506	H	S		Leonard Evans
Country Disposal	3886	050707	H	S		Lisa Huberty
D & K Disposal	2311	071404	H	S		John Larson
Elk Environmental Services, Inc.	731	5202	H	S		Mike Piazza
Enviro Organic Technologies	5394	52913			SL	Steve Gorsuch
Franc Environmental Inc.	3054	112806			SL	Tom Ferrero
Goodman Tank Lines, Inc.	5558	110113			SL	Joe Barthel
Grannetino Trucking	217	7001	H	S	SL	Gerry Grannetino, Barbara Jelke
Gray Brothers Inc. Septic Service		121913		S		Dan Spracklin
Honeydipper Septic Service J. Brehm Inc.	211	0040	H	S	SL	John, Tammy Brehm
Ink's Disposal	3171	052207	H	S	SL	Jody Ink
Kline's Services, Inc.	2060	4003	H	S	SL	Barb Culton
Kreider & Martin LLC*	2915	051706	H			Glenn Martin
Kristman Excavating Inc.- David	2376	052604		S		David Kristman
Lauman's Septic Pumping	729	5002	H	S		Tom, Pat Lauman
Levengood Septic Service	221	002	H	S	SL	Gloria Levengood
Lewis Environmental, Inc.	692	3002	H	S	SL	Donna Shingle
Liquid Motion	216	101612	H	S	SL	Jeff Miller
Litzenberger's Septic Service	5413	61013			SL	Merlin Litzenberger
McGovern Environmental LLC	3461	1138	H	S	SL	Alan Tulish
McGovern,, Inc.	1429	2002	H	S	SL	Bruce Critchlow
Mr. Rehab, Inc.	5180	111512				Drew Park
Mobile Dredging & Pumping Co.	4291	081010			SL	Jennifer Jeanes
Norbill Disposal Service	5564	112013	H	S		Jason Moyer
Port A Bowl Restroom Co.	2349	100404	H	S		Cory Trucksess
Potty King	5651	11014	H			Rick Gotwals
PreDoc	3907	060409	H	S		Ashley Arkatin
RD Excavating Co., Inc.	4861	101811		S		Richard Durnall
Relief Rentals	3475	07104		S		Brian Young
Rinehart's Sanitation Services	218	4001	H	S	SL	
Robbins Septic Services LLC	3507	092308	H	S		Debbie Robbins
Royal Throne Portable Toilets	4258	060910		S		Lynne Adam
Sam Ringler Trucking	5053				SL	Sam Ringler
Steve Eldredge Sanitation	2957	062806		S		Steve Eldredge
Stoltzfus Septic Service - Lonnie	3173	041007			SL	Lonnie Stoltzfus
Sustainable Resources Group	4851	22712			SL	Brian Clarke
Synagro Central LLC	3590	112508			SL	Richard Hushon
US Environmental	1428	4002	H	S	SL	Gregg Baitinger
Venezia Transport	212	9027	H	S		JP Venezia
Vision Transport Inc.	4954	30712	H			Timmy Markoglu
Winding Creek	3003	090606	H	S		Bob Laubach

*Bill to: A & M Composting, Dennis McVeigh, 2022 Mountian Rd., Manheim, PA 17545, 267-228-1011

H - Holding. S - Septage, portable toilets, SL - sludge

Expired Permit

Borough of Pottstown
Wastewater Treatment Plant

Fee Schedule – 2012

Holding	$0.0119/ gal	
Septage	$0.0237/ gal	
Leachate	High Strength $0.0178/ gal Low Strength $0.0119/ gal *** High and low strength levels subject to evaluation by the Superintendent of the Pottstown Wastewater Treatment Plant*	
Sources with High TDS	$0.0534/ gal *** Sources shall be determined as having High Dissolved Solids by the Superintendent of the Pottstown Wastewater Treatment Plant*	
John Middleton	$0.0288/ gal	<3% solids
	Follow sludge rate	>3% solids
Blood waste	sludge rate	
A & M Composting	High strength leachate	
Sludge		

% Sludge	
0 to 3	$0.0356
3.01 to 4	$0.0475
4.01 to 5	$0.0594
5.10 to 6	$0.0712
6.01 to 7	$0.0832
7.01 to 8	$0.0951
8.01 to 9	$0.1070
9.01 to 10	$0.1188
10.01 to 11	$0.1307
11.01 to 12	$0.1426
12.01 to 13	$0.1544
13.01 to 14	$0.1663
14.01 to 15	$0.1782
15.01 to 16	$0.1901
16.01 to 17	$0.2019
17.01 to 18	$0.2138
18.01 to 19	$0.2258
19.01 to 20	$0.2377
20.01 to 21	$0.2495
21.01 to 22	$0.2614
22.01 to 23	$0.2733
23.01 to 24	$0.2852
24.01 to 25	$0.2970
25.01 to 26	$0.3089
26.01 to 27	$0.3208
27.01 to 28	$0.3326
28.01 to 29	$0.3446
29.01 to 30	$0.3565

2013 - Total Gallons of Bulk Wastestream

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Digester	2,397,700	2,351,268	1,914,365	2,330,196	2,960,146	2,483,004	2,791,862	1,960,749	1,488,700	2,684,270	1,881,292	2,336,400	27,579,952
Holding	1,569,305	1,171,323	1,537,881	1,420,157	1,534,031	1,385,359	1,743,001	1,813,716	1,402,301	1,270,427	1,056,892	1,635,801	17,540,194
Leachate	3,229,353	3,886,805	3,906,235	3,482,266	3,165,214	2,790,153	3,550,528	3,200,430	1,493,563	3,379,870	1,711,663	3,322,707	37,118,787
Septage	539,625	396,445	542,280	830,955	889,800	793,745	786,365	761,990	794,155	852,075	751,940	605,343	8,544,718
Monthly Total	7,735,983	7,805,841	7,900,761	8,063,574	8,549,191	7,452,261	8,871,756	7,736,885	5,178,719	8,186,642	5,401,787	7,900,251	

Comparison of Total gallons and Revenue per Year for Digester, Holding, Leachate and Septage Waste from 2006-2013

	2006		2007		2008		2009		2010		2011		2012		2013	
	gallons	$	gallons	$	gallons	$	gallons	$	gallons	$	gallons	$	gallons	$	gallons	$
# of haulers	34		46		49		50		50		50		56		56	
Digester	22,779,859	$844,467.12	25,336,155	$930,530.24	18,641,029	$642,787.34	19,863,405	$688,689.88	21,315,861	$743,702.31	28,436,093	$1,008,192.54	31,623,522	$1,329,710.79	27,579,952	$1,116,263.69
Holding	55,956,830	$629,117.00	17,686,220	$191,743.32	13,016,814	$197,942.58	13,959,695	$738,894.39	10,952,021	$752,061.31	9,404,652	$840,882.19	15,683,385	$411,909.92	17,540,194	$265,492.71
Leachate			38,009,876	$121,876.23	43,705,540	$125,965.21	33,161,866		31,523,311		50,875,618		34,761,365	$263,978.91	37,118,787	$450,604.89
Septage	6,869,951	$137,608.19	7,968,817	$167,741.34	8,687,038	$178,998.30	11,751,970		11,320,342		10,326,896		8,121,019	$128,724.03	8,544,718	$202,480.20
TOTAL WW	85,606,640	$1,611,192.31	89,001,068	$1,411,891.13	84,050,421	$1,145,693.43	78,736,936	$1,427,584.27	75,111,535	$1,495,763.62	99,043,259	$1,849,074.73	90,189,291	$2,134,323.65	90,783,651	$2,034,841.49

Comparison of Fee Schedule for Bulk Wastewater from 2009-2014

		2009	2010*	2011	2012*	2013	2014
Holding		$0.0103	$0.0106	$0.0106	$0.0119	$0.0119	$0.0119
Septage		$0.0206	$0.0212	$0.0212	$0.0237	$0.0237	$0.0237
Leachate	high strength	$0.0155	$0.0159	$0.0159	$0.0178	$0.0178	$0.0178
	low strength	$0.0103	$0.0106	$0.0106	$0.0119	$0.0119	$0.0119
High TDS		$0.0464	$0.0477	$0.0477	$0.0534	$0.0534	$0.0534
Sludge	0-3%	$0.0309	$0.0318	$0.0318	$0.0356	$0.0356	$0.0356
	3.01-4%	$0.0412	$0.0424	$0.0424	$0.0475	$0.0475	$0.0475
	4.01-5%	$0.0515	$0.0530	$0.0530	$0.0594	$0.0594	$0.0594
	5.01-6%	$0.0618	$0.0637	$0.0637	$0.0712	$0.0712	$0.0712
	6.01-7%	$0.0721	$0.0743	$0.0743	$0.0832	$0.0832	$0.0832

* denotes an increase

TOTAL SOLIDS FOR CLASS A BIOSOLIDS-2012

JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	
**	**	**	96.01	95.75	97.79	**Dryer OOS
			93.02	96.34	96.76	
			92.31	97.41	97.10	
			92.41	93.07	95.86	
			92.48	93.86	98.05	
			94.14	96.27	97.31	
			93.18	97.60		
			96.87	96.98		
			90.83			
			94.98			
			95.59			
			96.17			
			96			
			96.47			
			95.55			
			96.54			
			95.27			
			97.13			
			98.27			
			97.64			
			98.04			
			96.67			
			95.28			
AVERAGE:	AVERAGE:	AVERAGE:	AVERAGE:	AVERAGE:	AVERAGE:	
#DIV/0!	#DIV/0!	#DIV/0!	93.80	95.91	97.22	

JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
96.34	98.1	99.09	98.26	96.92	99.13
97.07	98.56	97.74	98.28	98.92	98.09
94.1	94.94	99.23	99.15	96.81	98.34
94.71	97.13	98.92	99.39	97.17	96.15
95.9	97.05	98.45	96.2	97.43	94.5
94.36	97	96.59	97.53	99.13	94.7
93.72	96.84	97.7	97.71		
99.08	96.99	97.15			
	99.6				
	98.28				
	28.55				
	99.08				
AVERAGE:	AVERAGE:	AVERAGE:	AVERAGE:	AVERAGE:	AVERAGE:
95.66	91.84	98.11	98.07	97.73	96.82

Appendix Q

LAND APPLICATION OF BIOSOLIDS

2012 ANNUAL OPERATION REPORT

POTTSTOWN WASTEWATER TREATMENT PLANT

Located in

Pottstown, Montgomery County, PA

February 2013

Prepared by

MATERIAL MATTERS, Inc.

MATERIAL
MATTERS, Inc.

P.O. Box 224
Elizabethtown, PA 17022
717/367-9697
717/367-0367 FAX
www.materialmatters.com

February 28, 2013

Department of Environmental Protection
Southeast Regional Office
Bureau of Water Quality
2 East Main Street
Norristown, PA 19401
Attn: Nancy Sansoni

Re: Pottstown Borough Authority
Annual Reports – PAG-07-0011 and PAG-08-0005

Dear Ms. Sansoni:

Material Matters, Inc. is submitting the 2012 Pennsylvania Department of Environmental Protection (PADEP) PAG-07 and PAG-08 annual operating reports along with supporting documentation on behalf of the Pottstown Wastewater Treatment Plant (WWTP).

In 2012, 2,538.7 DT of EQ pellets was distributed to an outside vendor, and beneficially utilized in land application as part of the PAG-07 permit. Additionally, 1,037.4 DT of cake was directed to landfill.

Pottstown was granted coverage under general permit number PAG-08-0005 on June 26, 2012. As part of the recordkeeping and reporting requirements for this permit, a Part I Biosolids Quality Certification form is attached as part of the 2012 annual report. No class B cake was produced at the Pottstown WWTP during the 2012 reporting year; therefore, no pathogen reduction, vector attraction reduction, or pollutant analyses were conducted in 2012. Nor are there any farms associated with the PAG-08 permit, so there are no Part II components to the annual report. Any cake produced prior to the PAG-08 permit was sent to landfill.

Dried EQ biosolids were produced only during the months of April through December, 2012. The dryer was taken out of service in November 2011 for repairs. There was no production of dried biosolids during the January-February Monitoring Period; testing per the Sampling Plan was not possible in this period. Therefore, pollutant, pathogen, and VAR sampling on the dried biosolids was not performed in the first Monitoring Period. Two analyses of the centrifuge cake, which feeds the dryer, were taken on January 24, 2012 and February 22, 2012. The results demonstrate that, for the metals analyzed, Table 3 concentrations were not exceeded. These results are available on-site.

The dryer was brought back online halfway through the second monitoring period (March 31, 2012). Routine sampling outside of the scope of the Sampling Plan was performed as follows:

Dryer temperatures were maintained at or above 217°F. Data from SCADA and operator log sheets are available on-site to document that the dryer met minimum operating conditions to meet pathogen reduction requirements.

Multiple weekly sample analyses of dried biosolids TS were performed outside of the Sampling Plan during the month of April. These data are available on-site to document that the dryer met the minimum 90% TS for meeting vector attraction reduction.

Should you have any questions, or require additional information, please contact me at (717) 367-9697 or Brent Wagner of the Pottstown WWTP at (610) 970-6540.

Very truly yours,
Material Matters, Inc.

Aaron Stephens
Vice President of IST

xc: DEP Southeastern Regional Office (original + copy)
Montgomery County Conservation District (copy)
Brent Wagner, Superintendent, Pottstown WWTP (copy)

3800-FM-WSFR0339 8/2005

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

\COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

General Permit Number:
PAG-07 0011
Reporting Period 2012

RECORDKEEPING AND REPORTING FORM
PAG-07

A. General Information:

Permittee's Name: Pottstown Borough Authority

Address:

100 East High St

Pottstown, PA 19464

B. Pollutant Concentrations: **Attach analytical results** for the following pollutants in the exceptional quality biosolids that are applied to the land or that is sold, given away or distributed in a bag or other container for beneficial use. **(See Exhibit A)**

Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)
Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)
Selenium (mg/kg)	Zinc (mg/kg)	Molybdenum (mg/kg)
PCBs (mg/kg)		

C. Pathogen Reduction Achieved: Indicate which of the following treatment alternatives was used prior to beneficial use of the exceptional quality biosolids. For Alternatives 5 and 6, **list** the specific Process to Further Reduce Pathogens (PFRP):

☐ Alternative 1 ☐ Alternative 2 ☐ Alternative 3

☐ Alternative 4 ☒ Alternative 5: Heat Drying (PFRP) ☐ Alternative 6: _____ (Equiv. PFRP)

Briefly describe the biosolids treatment process performed and **submit analytical results and/or process data** to demonstrate that the pathogen reduction selected was met:

A dryer is used to heat the biosolids to 176°F or higher. Temperature, total solids, and fecal coliform are measured to verify the PFRP. The fecal coliform results of seven samples analyzed in each 60-day sampling period are less than 1000 MPN per gram dry solids. Additionally, the biosolids average total solids in each 60-day testing period meets or exceeds 90% total solids.

(See Exhibit B)

D. Vector Attraction Reduction Performed: Indicate which of the following treatment options was performed prior to beneficial use of the exceptional quality biosolids:

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Option 4
☐ Option 5 ☐ Option 6 ☒ Option 7 ☐ Option 8

Briefly describe the biosolids treatment process performed and **submit analytical results and/or process data** to demonstrate that the vector attraction reduction selected was met:

A heat dryer system is used to dry the bioslids. Biosolids samples are collected and analyzed in a 60-day sampling periods. The average percent total solids in each 60-day period meets or exceeds 75% total solids.

(See Exhibit C)

E. If one of the vector attraction reduction options 1 - 5 in Section D of this form is selected, was the pathogen reduction treatment alternative chosen in Section C of this form met prior to or at the same time the vector attraction reduction option chosen in Section D was met? ☐ Yes ☐ No

F. For the purposes of compliance with terms, conditions, statutes, rules and regulations described in the general permit (PAG-07):

1. **Exceptional quality biosolids sold, given away or otherwise distributed in a bag or other container:**

   On the line below, indicate the total amount (dry weight basis) of exceptional quality biosolids sold, given away or distributed in a bag or other container. For amounts greater than 1.1 dry tons distributed during the monitoring period to a single recipient, attach a list identifying the name and address of each recipient and the amount of biosolids distributed.

   Total amount distributed: 2538.7 dry tons **(See Exhibit D)**

2. **Bulk application of exceptional quality biosolids conducted by Permittee:**

   Provide the following information when bulk applications of EQ biosolids were conducted by the permittee or agent for the permittee:

   Site Name: N/A

   Site Location: _____ Municipality: _____ County: _____

   Amount of exceptional quality biosolids land applied _____ (dry tons)

   Description of the beneficial use(s) of exceptional quality biosolids _____

3. **Application rates:** Attach a summary of application records for each field receiving exceptional biosolids applied by the permittee or agent for the permittee during the reporting year. For agricultural applications, include the information shown on the attached worksheets (Agronomic Rates).

4. **Training required**: Name of certified/trained personnel responsible for the land application activity:

   N/A -- Borough Authority / Agent does not perform land application activity.

G. Certification: I certify, under penalty of law, that one of the Class A pathogen requirements in Title 25 Pa. Code, §271.932(a) and vector attraction reduction requirements specified in Title 25 Pa. Code, §271.933(b)(1) - (b)(8) have been met. This determination has been made under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen reduction requirements and vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

NAME AND OFFICIAL TITLE (Use Corporate or Professional Seal As Appropriate):

Name: Brent M. Wagner **Title:** Utilities Director

Signature: Brent M Wagner

Telephone: (610) 970-6540 **Date Signed:** 02/20/2013

3800-FM-WSFR0340 8/2005

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

General Permit Number
PAG-08 0005
Reporting Year 2012

RECORDKEEPING AND REPORTING FORM
PAG-08

PART I
BIOSOLIDS QUALITY CERTIFICATION

Have biosolids been land applied during this reporting year? ☐ Yes ☒ No

A. General Information:

Permittee's Name: Pottstown Borough Authority

Address: 100 East High Street
Pottstown, PA 19464

B. Pollutant Concentrations: **Attach all analytical results** for the reporting year for the following pollutants in the biosolids that were land applied. Also include analyses for organic and ammonium nitrogen.

Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)
Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)
Selenium (mg/kg)	Zinc (mg/kg)	Molybdenum (mg/kg)
PCBs (mg/kg)		

N/A -- Class B biosolids were not produced in 2012

C. Pathogen Reduction Achieved: Indicate which of the following treatment alternatives the biosolids met prior to beneficial use: for Class A Alternatives 5 and 6 and Class B Alternatives 2 and 3, **list** the specific Process to Further Reduce Pathogens (PFRP) or Process to Significantly Reduce Pathogens (PSRP).

Class A: ☐ Alternative 1 ☐ Alternative 2 ☐ Alternative 3

☐ Alternative 4 ☐ Alternative 5: _____ PFRP ☐ Alternative 6: _____ Equiv. PFRP

Class B: ☒ Alternative 1 ☐ Alternative 2: _____ PSRP ☐ Alternative 3: _____ Equiv. PSRP

Describe the biosolids treatment process performed and **submit analytical results and/or other process data** to demonstrate that the selected pathogen reduction alternative was met:

Solids are treating via aerobic digestion for pathogen reduction. Fecal coliform samples are collected only during bi-monthly monitoring periods where class B cake is being produced. No class B cake was produced after obtaining the PAG-08 permit in this reporting year; therefore no Pathogen Reduction analyses were performed.

D. Vector Attraction Reduction Performed: Indicate which of the following options the biosolids met prior to land application:

☐ Option 1 ☐ Option 2 ☐ Option 3 ☒ Option 4

☐ Option 5 ☐ Option 6 ☐ Option 7 ☐ Option 8 ☐ None

Describe the biosolids treatment process performed and **submit analytical results and/or other process data** to demonstrate that the selected vector attraction reduction option was met:

Solids are treating via aerobic digestion for vector attraction reduction. SOUR testing is conducted on digested liquid biosolids samples only during bi-monthly monitoring periods where class B cake is being produced. No class B cake was produced after obtaining the PAG-08 permit in this reporting year; therefore no Pathogen Reduction analyses were performed.

E. Certification: I certify, under penalty of law, that the pathogen reduction requirements in Title 25 Pa. Code, §271.932 (b) and vector attraction reduction requirements in Title 25 Pa. Code, §271.933(b)(4) have been met. This determination has been made under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen reduction requirements and vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

NAME AND OFFICIAL TITLE (Use Corporate or Professional Seal As Appropriate):

Name: N/A -- Class B biosolids were not produced in 2012 **Title:** _____

Signature: _____

Telephone: ( ) _____ **Date Signed:** _____

Pottstown Borough Authority
2012 PADEP Annual Biosolids Report
Pollutant Summary

BIOSOLIDS LABORATORY ANALYSIS DATA											
Year - Number of Analyses							2012	2012	2012	2012	2012
Laboratory Performing Tests	Min	Avg	Max				PSU	PSU	PSU	PSU	PSU
Lab Sample ID	Values	Values	Values	Regulated EQ							
Date Sampled	From	From	From	Pollutant Limit		N/A	04/04/12	06/04/12	08/02/12	10/02/12	11/29/12
Date Received	all	all	all	PADEP	EPA		04/05/12	06/05/12	08/03/12	10/03/12	11/30/12
Report Date	Analyses	Analyses	Analyses	Table 3	Table 3		04/19/13	06/25/12	08/17/12	10/17/12	12/13/12
pH	6.1	NA	7.2	---	---		7.1	6.8	7.2	7.2	6.1
% Total Solids	78.95%	84.73%	89.61%	---	---		82.34%	89.61%	86.92%	85.84%	78.95%
% Volatile Solids	51.38%	60.20%	72.38%	---	---		61.45%	60.50%	55.31%	51.38%	72.38%
Primary Nutrients (% dry wt)											
Total Kjeldehl N	3.79%	4.68%	6.11%	---	---		4.94%	4.52%	4.02%	3.79%	6.11%
Organic N	3.77%	4.62%	6.04%	---	---		4.87%	4.42%	3.99%	3.77%	6.04%
Ammonia N	0.02%	0.06%	0.10%	---	---		0.07%	0.10%	0.03%	0.02%	0.07%
Total Phosphorus (P)	1.85%	2.02%	2.13%	---	---		2.12%	2.13%	1.98%	1.85%	2.04%
Potassium (K)	0.22%	0.28%	0.32%	---	---		0.32%	0.32%	0.22%	0.25%	0.30%
Other Nutrients (% dry wt)											
Magnesium (Mg)	0.30%	0.38%	0.44%	---	---		0.41%	0.37%	0.44%	0.40%	0.30%
Calcium (Ca)	1.85%	7.74%	11.23%	---	---		8.55%	6.99%	10.06%	11.23%	1.85%
Sodium (Na)	0.18%	0.48%	1.13%	---	---		1.13%	0.27%	0.51%	0.32%	0.18%
Iron (Fe)	1.81%	2.41%	3.06%	---	---		1.81%	2.27%	3.06%	2.50%	2.41%
Aluminum (Al)	1.55%	2.14%	2.38%	---	---		2.14%	2.31%	2.38%	2.31%	1.55%
Manganese (Mn) (mg/kg)	370.8	672.5	890.1	---	---		370.8	617.8	854.7	890.1	629.2
Regulated Metals (mg/kg)											
Arsenic (As)	9.79	15.55	23.23	41.0	41.0		23.23	11.79	19.59	13.36	9.79
Cadmium (Cd)	1.47	1.65	2.02	39.0	39.0		2.02	1.63	1.55	1.47	1.59
Chromium (Cr)	37.9	41.8	46.7	NA	NA		39.9	43.5	46.7	41.0	37.9
Copper (Cu)	619.1	713.2	958.0	1,500	1,500		619.1	698.3	657.8	632.7	958.0
Lead (Pb)	29.4	33.9	40.4	300	300		36.7	31.7	29.4	31.5	40.4
Mercury (Hg)	0.85	1.46	1.91	17.0	17.0		1.52	1.91	1.25	0.85	1.77
Molybdenum (Mo)	7.5	8.9	10.9	75.0*	75.0*		7.5	7.8	10.1	8.3	10.9
Nickel (Ni)	19.5	29.2	54.4	420	420		54.4	21.1	27.8	19.5	23.3
Selenium (Se)	3.65	4.36	5.29	100	100		4.30	4.62	3.65	3.94	5.29
Zinc (Zn)	653.5	724.6	774.5	2,800	2,800		761.6	653.5	763.0	670.3	774.5
Other Analyses (mg/kg)											
PCB's	<0.03	<0.03	<0.03	4.0	50.0		<0.03	<0.03	<0.03	<0.03	<0.03

* "EPA and DEP Table 1 Ceiling Concentration"

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University Park, PA 16802

Phone: 814-863-0841
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Web: www.aasl.psu.edu

PA DEP Lab ID # 14-00588

Analysis Report for Use of Biosolids on Cropland

Brent M Wagner
Pottstown WWTP
100 East High Street
Pottstown PA 19464

Lab Sample ID: E15243
Date Received: April 5, 2012
Date Sampled: 4/4/12
Report Date: 4/19/12
Sample type: Grab
County: Montgomery
Customer Sample ID: Dryer Class A Biosolids

RESULTS

pH	Solids	Volatile	Tot-N	Org-N	NH_4 N	P	K	Mg	Ca	Na	Fe	Al
@ 22.4 C	— % —	% (dry weight basis)										
7.1	82.34	61.45	4.94	4.87	0.07	2.12	0.32	0.41	8.55	1.13	1.81	2.14

Mn	As	Cd	Cr	Cu	Pb	Hg	Mo	Ni	Se	Zn	PCB[1]
mg/kg (dry weight basis)											
370.8	23.23	2.02	39.9	619.1	36.7	1.52	7.5	54.4	4.3	761.6	< .03

NR-Not Requested One dry ton of this material is equivalent to 291 gallons of wet material or 1.2 tons of wet material

PRIMARY NUTRIENT CONTENT

	% (dry wt basis)		
Total N	4.94	1.01	dry tons of this biosolid will supply 100 lbs of total N.
s	4.86	2.36	dry tons of this biosolid will supply 100 lbs of P
K_2O	0.38		

ANALYSIS INFORMATION FOR EPA 503 POLLUTANTS

Analyte	EPA SW-846 Method	Analyst	Date	Time
Cd,Cu,Mo,Pb,Ni,Zn	3050B + 6010	Brooks	4/13/2012	10:51:38
As	3050B + 6010	Brooks	4/13/2012	10:51:38
Se	3050B + 6010	Brooks	4/13/2012	10:51:38
Hg	7473	Brooks	4/17/2012	1:47:31 PM
PCB[1]	8082			

[1]Subcontracted to Fairway Laboratories, Inc. (ID 7-00062)

RAW LABORATORY BENCH DATA FOR EPA 503 POLLUTANTS

	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
Wet Wt. aliquot (g)	0.761	0.761	0.761	0.055	0.761	0.761	0.761	0.761	0.761
Analyte conc. in sample/ digest (mg/L except Hg)	0.291	0.025	7.76	0.069 ug	0.09	0.68	0.46	0.05	9.54
Method limit (mg/L except Hg)	0.015	0.005	0.015	0.0010 ug	0.015	0.010	0.025	0.025	0.050

Optional Analyses: Results (except soluble salts) on dry weight basis					Sample Receipt
Nitrate-N (mg/kg)	Total Carbon (%)	CCE Calcium Carbonate Equivalent (%)	Soluble Salts (mmhos/cm)	Other:	

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Web: www.aasl.psu.edu

PA DEP Lab ID # 14-00588

Analysis Report for Use of Biosolids on Cropland

Brent M Wagner
Pottstown WWTP
100 East High Street
Pottstown PA 19464

Lab Sample ID: E15328
Date Received: June 5, 2012
Date Sampled: 6/4/12
Report Date: 6/25/12
Sample type: Grab
County: Montgomery
Customer Sample ID: Dryer Class A Biosolids

RESULTS

pH	Solids	Volatile	Tot-N	Org-N	NH_4 N	P	K	Mg	Ca	Na	Fe	Al
@ 22.7 C	— % —	% (dry weight basis)										
6.8	89.61	60.50	4.52	4.42	0.10	2.13	0.32	0.37	6.99	0.27	2.27	2.31

Mn	As	Cd	Cr	Cu	Pb	Hg	Mo	Ni	Se	Zn	PCB[1]
mg/kg (dry weight basis)											
617.8	11.79	1.63	43.5	698.3	31.7	1.91	7.8	21.1	4.62	653.5	< .03

NR-Not Requested One dry ton of this material is equivalent to 268 gallons of wet material or 1.1 tons of wet material

PRIMARY NUTRIENT CONTENT

	% (dry wt basis)		
Total N	4.52	1.11	dry tons of this biosolid will supply 100 lbs of total N.
s	4.87	2.35	dry tons of this biosolid will supply 100 lbs of P
K_2O	0.38		

ANALYSIS INFORMATION FOR EPA 503 POLLUTANTS

Analyte	EPA SW-846 Method	Analyst	Date	Time
Cd,Cu,Mo,Pb,Ni,Zn	3050B + 6010	Brooks	6/18/2012	11:12:43
As	3050B + 6010	Brooks	6/18/2012	11:12:43
Se	3050B + 6010	Brooks	6/18/2012	11:12:43
Hg	7473	Rishel	6/14/2012	11:07:03 AM
PCB[1]	8082			

[1]Subcontracted to Fairway Laboratories, Inc. (ID 7-00062)

RAW LABORATORY BENCH DATA FOR EPA 503 POLLUTANTS

	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
Wet Wt. aliquot (g)	0.652	0.652	0.652	0.076	0.652	0.652	0.652	0.652	0.652
Analyte conc. in sample/ digest (mg/L except Hg)	0.138	0.019	8.16	0.130 ug	0.09	0.25	0.37	0.05	7.64
Method limit (mg/L except Hg)	0.015	0.005	0.015	0.0010 ug	0.015	0.010	0.025	0.025	0.050

Optional Analyses: Results (except soluble salts) on dry weight basis				Sample Receipt
Nitrate-N (mg/kg)	Total Carbon (%)	CCE Calcium Carbonate Equivalent (%)	Soluble Salts (mmhos/cm) Other:	

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Web: www.aasl.psu.edu

PA DEP Lab ID # 14-00588

Analysis Report for Use of Biosolids on Cropland

Brent M Wagner
Pottstown WWTP
100 East High Street
Pottstown PA 19464

Lab Sample ID: E15405
Date Received: August 3, 2012
Date Sampled: 8/2/12
Report Date: 8/17/12
Sample type: Grab
County: Montgomery
Customer Sample ID: Class A Dryer Biosolids

RESULTS

pH	Solids	Volatile	Tot-N	Org-N	NH_4 N	P	K	Mg	Ca	Na	Fe	Al
@ 24.1 C	— % —	% (dry weight basis)										
7.2	86.92	55.31	4.02	3.99	0.03	1.98	0.22	0.44	10.06	0.51	3.06	2.38

Mn	As	Cd	Cr	Cu	Pb	Hg	Mo	Ni	Se	Zn	PCB[1]
mg/kg (dry weight basis)											
854.7	19.59	1.55	46.7	657.8	29.4	1.25	10.1	27.8	3.65	763.0	< .03

NR-Not Requested One dry ton of this material is equivalent to 276 gallons of wet material or 1.2 tons of wet material

PRIMARY NUTRIENT CONTENT

	% (dry wt basis)		
Total N	4.02	1.24	dry tons of this biosolid will supply 100 lbs of total N.
$_5$	4.54	2.52	dry tons of this biosolid will supply 100 lbs of P
K_2O	0.27		

ANALYSIS INFORMATION FOR EPA 503 POLLUTANTS

Analyte	EPA SW-846 Method	Analyst	Date	Time
Cd,Cu,Mo,Pb,Ni,Zn	3050B + 6010	Stecko	8/10/2012	7:58:20
As	3050B + 6010	Stecko	8/10/2012	7:58:20
Se	3050B + 6010	Stecko	8/10/2012	7:58:20
Hg	7473	Brooks	8/8/2012	12:31:15 PM
PCB[1]	8082			

[1]Subcontracted to Fairway Laboratories, Inc. (ID 7-00062)

RAW LABORATORY BENCH DATA FOR EPA 503 POLLUTANTS

	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
Wet Wt. aliquot (g)	0.480	0.480	0.480	0.069	0.480	0.480	0.480	0.480	0.480
Analyte conc. in sample/ digest (mg/L except Hg)	0.163	0.013	5.49	0.075 ug	0.08	0.23	0.25	0.03	6.37
Method limit (mg/L except Hg)	0.015	0.005	0.015	0.0010 ug	0.015	0.010	0.025	0.025	0.050

Optional Analyses: Results (except soluble salts) on dry weight basis					Sample Receipt
Nitrate-N (mg/kg)	Total Carbon (%)	CCE Calcium Carbonate Equivalent (%)	Soluble Salts (mmhos/cm)	Other:	

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PA DEP Lab ID # 14-00588

Analysis Report for Use of Biosolids on Cropland

Brent M Wagner
Pottstown WWTP
100 East High Street
Pottstown PA 19464

Lab Sample ID: E15491
Date Received: October 3, 2012
Date Sampled: 10/2/12
Report Date: 10/17/12
Sample type: Grab
County: Montgomery
Customer Sample ID: Dryer Biosolids

RESULTS

pH	Solids	Volatile	Tot-N	Org-N	NH_4N	P	K	Mg	Ca	Na	Fe	Al
@ 22.6 C	— % —	% (dry weight basis)										
7.2	85.84	51.38	3.79	3.77	0.02	1.85	0.25	0.40	11.23	0.32	2.50	2.31

Mn	As	Cd	Cr	Cu	Pb	Hg	Mo	Ni	Se	Zn	PCB[1]
mg/kg (dry weight basis)											
890.1	13.36	1.47	41.0	632.7	31.5	0.85	8.3	19.5	3.94	670.3	< .03

NR-Not Requested One dry ton of this material is equivalent to 279 gallons of wet material or 1.2 tons of wet material

PRIMARY NUTRIENT CONTENT

	% (dry wt basis)		
Total N	3.79	1.32	dry tons of this biosolid will supply 100 lbs of total N.
	4.24	2.70	dry tons of this biosolid will supply 100 lbs of P
K_2O	0.30		

ANALYSIS INFORMATION FOR EPA 503 POLLUTANTS

Analyte	EPA SW-846 Method	Analyst	Date	Time
Cd,Cu,Mo,Pb,Ni,Zn	3050B + 6010	Brooks	10/12/2012	10:51:06
As	3050B + 6010	Brooks	10/12/2012	10:51:06
Se	3050B + 6010	Brooks	10/12/2012	10:51:06
Hg	7473	Rishel	10/15/2012	9:28:24 AM
PCB[1]	8082			

[1]Subcontracted to Fairway Laboratories, Inc. (ID 7-00062)

RAW LABORATORY BENCH DATA FOR EPA 503 POLLUTANTS

	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
Wet Wt. aliquot (g)	0.866	0.866	0.866	0.060	0.866	0.866	0.866	0.866	0.866
Analyte conc. in sample/ digest (mg/L except Hg)	0.199	0.022	9.41	0.044 ug	0.12	0.29	0.47	0.06	9.97
Method limit (mg/L except Hg)	0.015	0.005	0.015	0.0010 ug	0.015	0.010	0.025	0.025	0.050

Optional Analyses: Results (except soluble salts) on dry weight basis

Nitrate-N (mg/kg)	Total Carbon (%)	CCE Calcium Carbonate Equivalent (%)	Soluble Salts (mmhos/cm)	Other:

Sample Receipt

PENNSTATE

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PA DEP Lab ID # 14-00588

Analysis Report for Use of Biosolids on Cropland

Brent M Wagner
Pottstown WWTP
100 East High Street
Pottstown PA 19464

Lab Sample ID: E15589
Date Received: November 30, 2012
Date Sampled: 11/29/12
Report Date: 12/13/12
Sample type: Grab
County: Montgomery
Customer Sample ID: Dryer Biosolids

RESULTS

pH	Solids	Volatile	Tot-N	Org-N	NH_4N	P	K	Mg	Ca	Na	Fe	Al
@ 23.5 C	— % —	% (dry weight basis)										
6.1	78.95	72.38	6.11	6.04	0.07	2.04	0.30	0.30	1.85	0.18	2.41	1.55

Mn	As	Cd	Cr	Cu	Pb	Hg	Mo	Ni	Se	Zn	PCB[1]
mg/kg (dry weight basis)											
629.2	9.79	1.59	37.9	958.0	40.4	1.77	10.9	23.3	5.29	774.5	<.03

NR-Not Requested One dry ton of this material is equivalent to 304 gallons of wet material or 1.3 tons of wet material

PRIMARY NUTRIENT CONTENT

	% (dry wt basis)		
Total N	6.11	0.82	dry tons of this biosolid will supply 100 lbs of total N.
	4.67	2.45	dry tons of this biosolid will supply 100 lbs of P
K_2O	0.36		

ANALYSIS INFORMATION FOR EPA 503 POLLUTANTS

Analyte	EPA SW-846 Method	Analyst	Date	Time
Cd,Cu,Mo,Pb,Ni,Zn	3050B + 6010	Brooks	12/7/2012	9:31:46
As	3050B + 6010	Brooks	12/7/2012	9:31:46
Se	3050B + 6010	Brooks	12/7/2012	9:31:46
Hg	7473	Rishel	12/5/2012	10:47:30 AM
PCB[1]	8082			

[1]Subcontracted to Fairway Laboratories, Inc. (ID 7-00062)

RAW LABORATORY BENCH DATA FOR EPA 503 POLLUTANTS

	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
Wet Wt. aliquot (g)	0.691	0.691	0.691	0.059	0.691	0.691	0.691	0.691	0.691
Analyte conc. in sample/ digest (mg/L except Hg)	0.107	0.017	10.45	0.082 ug	0.12	0.25	0.44	0.06	8.45
Method limit (mg/L except Hg)	0.015	0.005	0.015	0.0010 ug	0.015	0.010	0.025	0.025	0.050

Optional Analyses: Results (except soluble salts) on dry weight basis					Sample Receipt
Nitrate-N (mg/kg)	Total Carbon (%)	CCE Calcium Carbonate Equivalent (%)	Soluble Salts (mmhos/cm)	Other:	

Exhibit B
Pottstown Borough Authority
2012 PADEP Annual Biosolids Report

2012 Fecal Coliform Data Summary

Monitoring Period	Sample Date	Sample Number / Units						
		1	2	3	4	5	6	7
		MPN per gram of dry solids						
Jan/Feb	n/a	n/a						
Mar/Apr	4/4	<20	<20	<20	<20	<20	<20	<20
May/Jun	6/4	<20	<20	<20	<20	<20	<20	<20
Jul/Aug	8/2	<20	<20	<20	<20	<20	<20	<20
Sep/Oct	10/2	<20	<20	<20	<20	<20	<20	<20
Nov/Dec	11/29	<20	<20	<20	<20	<20	<20	<20

2012 Total Solids Data Summary

Monitoring Period	Average TS for Monitoring Period
Jan/Feb	n/a
Mar/Apr	95.3%
May/Jun	96.5%
Jul/Aug	93.8%
Sep/Oct	98.1%
Nov/Dec	97.3%
Average	96.2%

2012 Biosolids Temperature Data Summary

Monitoring Period	Sample Date	Sample Number / Units							Minimum
		1	2	3	4	5	6	7	
		Biosolids Exit Temperature (F) (collected on 15-minute invervals)							
Jan/Feb	n/a	n/a							n/a
Mar/Apr	4/4	273	273	273	273	271	271	270	**270**
May/Jun	6/4	315	315	315	316	316	316	316	**315**
Jul/Aug	8/2	260	262	263	263	265	267	267	**260**
Sep/Oct	10/2	286	285	284	281	279	278	277	**277**
Nov/Dec	11/29	300	300	300	300	300	299	299	**299**

Exhibit C
Pottstown Borough Authority
2012 PADEP Annual Biosolids Report
Process Vector Attraction Reduction

2012 Total Solids Data Summary		
Sampling Period	**Date**	**Avg.**
Jan/Feb	n/a	n/a
Mar/Apr	4/4	82.34%
May/Jun	6/4	89.61%
Jul/Aug	8/2	86.92%
Sep/Oct	10/2	85.84%
Nov/Dec	11/29	78.95%
		84.73%

Note: Per the sampling plan methodology, these samples are not handled to preclude the adsorption of moisture from the time of sample collection to analysis. Other samples (ie: fecal coliform or in-house TS samples) are handled under more controlled conditions and those demonstrate that the material is processed to meet or exceed 90% TS. These samples are to show that the material meets or exceeds 75% TS for VAR.

Exhibit D
Borough of Pottstown Authority
2012 PADEP Annual Biosolids Report
Land Application Utilization/Disposition Summary

Site Name	Site address	Municipality	County	2012 WT
Robert Hoffines Farm	184 Stackstown Rd, Marietta, PA 17547	East Donegal Twp	Lancaster	48.64
Jeff Hill	123 W Rauschs Rd, Orwigsburg, PA 17961	East Brunswick Twp	Schuylkill	371.19
Merrill Mest	3059 Keyser Rd, Schwenksville, PA 19473	Upper Frederick Twp	Montgomery	102.73
William Bean Farms	338 North Manor Rd, Elverson, PA	West Nantmeal Twp	Chester	168.82
Aaron H. Hoover	15 Hoover Ln, Bethel, PA 19507-9777	Tulpehocken Twp	Berks	70.77
Rinaldi Brothers Farms	3001 Kesslersville Rd, Easton, PA 18040	Forks Twp	Northampton	464.13
Clair Hursh	335 Carper Rd, Martinsburg, PA 16662	Taylor Twp	Blair	352.46
Earl Kough	195 Green Spring Rd, Newville, PA 17241	North Newton Twp	Cumberland	74.58
Calvin Beekman Farm	732 Franklin Rd, Boyertown, PA 19519	Washington Twp	Berks	127.27
Alvin Weaver Farm	980 Britton Rd, Shippensburg, PA 17257-9520	Southampton Twp	Cumberland	71.75
Wabank Farm	317 Spring Hill Rd, Quarryville, PA 17566	Little Britain Twp	Lancaster	24.94
Amos K. Beiler	504 Beiler Lane, Jersey Shore, PA 17740	Limestone Twp	Lycoming	24.54
Fox Farm	505 Pines Rd, Etters, PA 17319	Newberry Twp	York	304.96
Kenneth Martin Farm	3701 Raystown Rd, Hopewell, PA 16650	Hopewell Twp	Bedford	96.05
Isaeore Ollay Farm	32 Miller Lane, Temple, PA 19560	Alsace Twp	Berks	109.53
Keith Gerstenbert (Apple St Site)	2388 Apple St, Hellertown, PA 18055	Lower Saucon Twp	Northampton	47.66
Dwight Manbeck Farm	302 Manbeck Rd, Schuylkill Haven, PA 17972	Wayne Twp	Schuylkill	130.15
Amos Leid Farm	1481 Newburg Rd, Shippensburg, PA 17257	Southampton Twp	Cumberland	49.33

2639.5 WT
2538.7 DT
2303.0 DMT

DRYER TEMPERATURE @ TIME OF SAMPLING
FOR FECAL COLIFORM

4/4/12---- #1 -- 273 degrees
#2 – 273 degrees
#3 – 273 degrees
#4 – 273 degrees
#5 – 271degrees
#6 – 271 degrees
#7 – 270 degrees

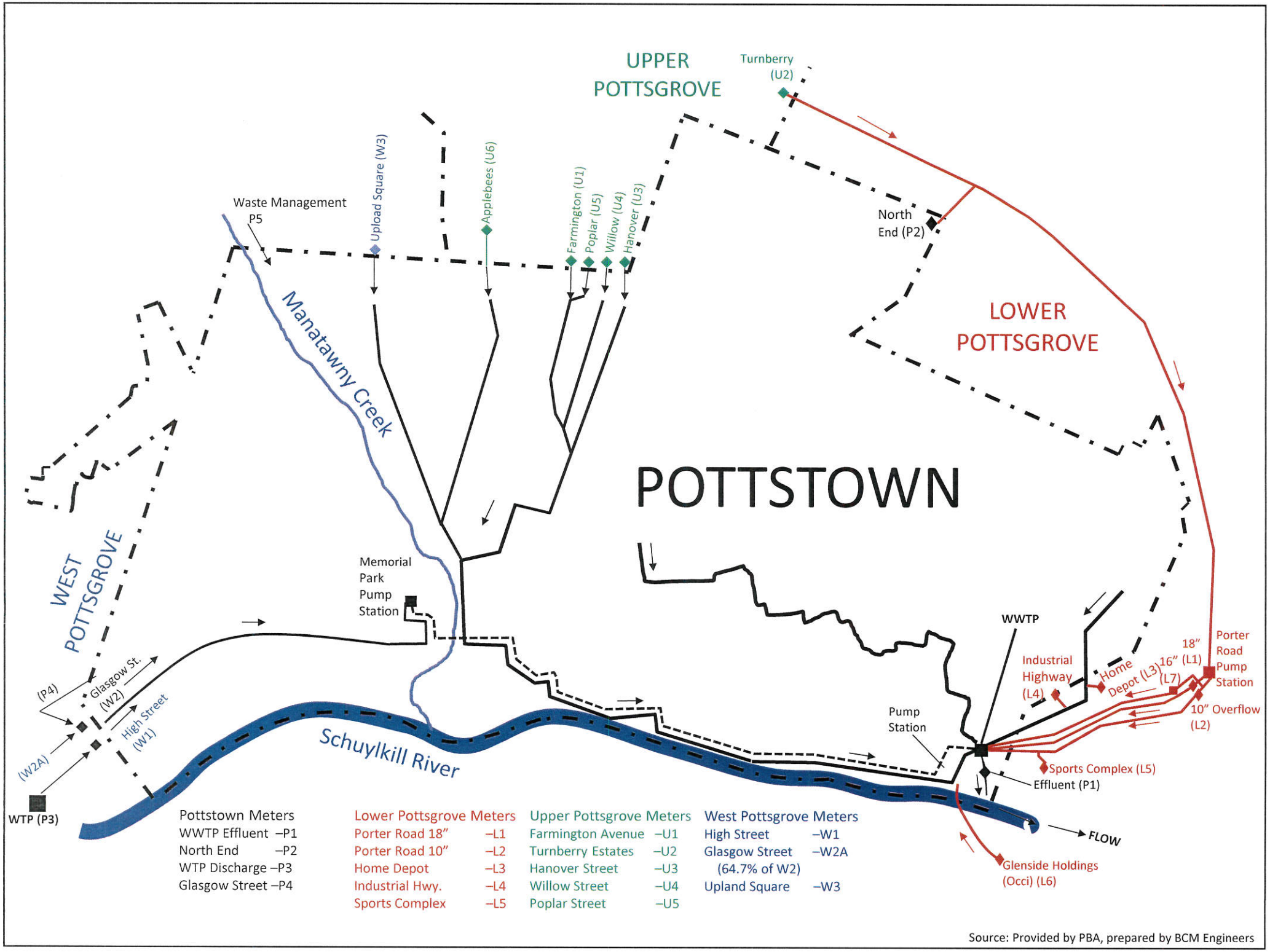
6/4/12--- #1 – 315 degrees
#2 – 315 degrees
#3 – 315 degrees
#4 – 316 degrees
#5 – 316 degrees
#6 – 316 degrees
#7 – 316 degrees

8/2/12---- #1 – 260 degrees
#2 – 262 degrees
#3 -- 263 degrees
#4 -- 263 degrees
#5 – 265 degrees
#6 – 267 degrees
#7 – 267 degrees

10/2/12--- #1 – 286 degrees
#2 – 285 degrees
#3 – 284 degrees
#4 – 281 degrees
#5 – 279 degrees
#6 – 278 degrees
#7 – 277 degrees

11/29/12----#1 – 300 degrees
#2 – 300 degrees
#3 – 300 degrees
#4 – 300 degrees
#5 – 300 degrees
#6 – 299 degrees
#7 – 299 degrees

Appendix R



Source: Provided by PBA, prepared by BCM Engineers

Appendix S

PUMP STATION INSPECTION - POTTSTOWN

PUMP STATION NAME
Circle of Progress

INSPECTION DATE	INSPECTION TIME		INSPECTION CREW	JMT Project #
4/11/2014	9:30	AM	JES	13-1117-001
		PM		

SITE ADDRESS/ LOCATION	MUNICIPALITY/OWNER
Circle of Progress Drive	Pottstown Borough Authority

GENERAL INFORMATION

VFD	Total No. of Pumps	No. of Primary Pumps	No. of Standby Pumps	Pump Manufacture
YES / NO	2	1	1	Flyght

Pump Type	Average Flow (MGD)	Generator	Wet Well		Pump Model
600 gpm	0.01	YES / NO	Shape	Round	N/A

Pump Size	Max Flow (MGD)	Generator Power	Wet Well		Influent Pipe Size(s)	Effluent Pipe Sizes(s)
600 gpm	0.03	Diesel	Size	60"	12"	4"
			Dry Well	No		

Pump Station Power Phase	SCADA	Upstream Screening	Valve Vault	Bypassing Option	Effluent Metering
3	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

Year Constructed	Year of Upgrades	FOG Issues	Recorded Overflows	Float System		
1985	N/A	YES / NO	YES / NO	ON / High	OFF / Low	Alarm / Low Low

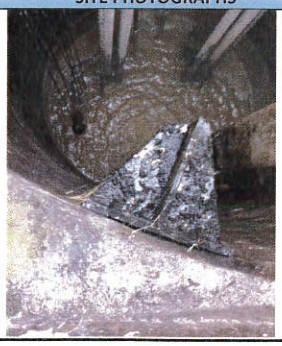
Oder Control	ROUTINE MAINTENANCE
YES / NO	Trash box is cleaned once a month.

NOTES

This pump station feeds into Memorial Park PS. All weekday flow due to business park. Major contributor is Slyfox brewing company. Slyfox is looking to expand by 30% of the next 5 years, PS may need to be upgraded due to brewery expansion. Authority has a current project that would add a mag-meter on the effluent pipe.

Pumps run for approximately 1.5 hours per day.

SITE PHOTOGRAPHS



PUMP STATION INSPECTION - POTTSTOWN

PUMP STATION NAME
Grosstown

INSPECTION DATE	INSPECTION TIME		INSPECTION CREW	JMT Project #
4/11/2014	1:10	AM **PM**	JES	13-1117-001

SITE ADDRESS/ LOCATION	MUNICIPALITY/OWNER
Grosstown Road (Adjacent to Municipal Building)	West Pottsgrove Township

GENERAL INFORMATION

VFD	Total No. of Pumps	No. of Primary Pumps	No. of Standby Pumps	Pump Manufacture
YES **NO**	2	1	1	Gorman Rupp

Pump Type	Average Flow (MGD)	Generator	Wet Well		Pump Model
Submersible		YES **NO**	Shape	Round	

Pump Size	Max Flow (MGD)	Generator Power			Influent Pipe Size(s)	Effluent Pipe Sizes(s)
270 gpm		Diesel	Size	8 feet	8"	4" (1,600 LF)
			Dry Well	No		

Pump Station Power Phase	SCADA	Upstream Screening	Valve Vault	Bypassing Option	Effluent Metering
3	YES **NO**	YES **NO**	**YES** NO	YES **NO**	YES **NO**

Year Constructed	Year of Upgrades	FOG Issues	Recorded Overflows	Float System		
	2013	YES **NO**	YES **NO**	**ON** **High**	**OFF** **Low**	**Alarm** **Low Low**

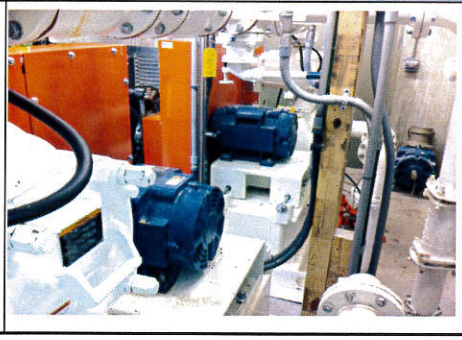
Oder Control	ROUTINE MAINTENANCE
YES **NO**	

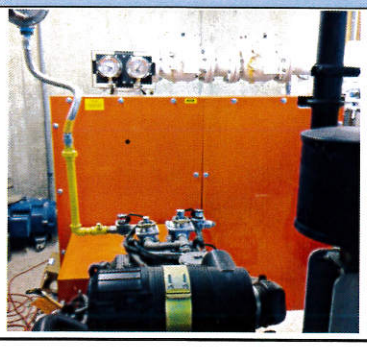
NOTES

Pump station was rebuilt in November 2013. Station serves 95 residential homes. Station does have a small propane-fueled enginer that can operate only 1 pump. Pump station pumps flow to Memorial Park PS.

The pump station has a stand-by by pass pump outside the facility to handle wet-weather events. PS was re-designed however wet-weather was not accounted for, therefore PS can not handle wet-weather events. Pumps within the station are manually turned off and by-pass pump is turned on for the duration of the event.

SITE PHOTOGRAPHS





PUMP STATION INSPECTION - POTTSTOWN

PUMP STATION NAME
Memorial Park

INSPECTION DATE	INSPECTION TIME		INSPECTION CREW	JMT Project #
4/11/2014	8:50	AM / PM	JES	13-1117-001

SITE ADDRESS/ LOCATION	MUNICIPALITY/OWNER
West King Street	Pottstown Borough Authority

GENERAL INFORMATION

VFD	Total No. of Pumps	No. of Primary Pumps	No. of Standby Pumps	Pump Manufacture
YES / NO	4	1	3	Yoeman (1995)

Pump Type	Average Flow (MGD)	Generator	Wet Well		Pump Model
Centrifugal Non-Clog	1	YES / NO	Shape	Square	N/A

Pump Size	Max Flow (MGD)	Generator Power	Wet Well		Influent Pipe Size(s)	Effluent Pipe Sizes(s)
1,800 gpm	10	Diesel	Size	23' deep	24"	30"
			Dry Well	No		

Pump Station Power Phase	SCADA	Upstream Screening	Valve Vault	Bypassing Option	Effluent Metering
3	YES / NO	YES / NO	YES / NO	YES / NO	YES * / NO

Year Constructed	Year of Upgrades	FOG Issues	Recorded Overflows	Float System		
1991	1995	YES / NO	YES / NO	ON / High	OFF / Low	Alarm / Low Low

Oder Control	ROUTINE MAINTENANCE
YES / NO	Service pumps yearly. Generator exercised weekly.

NOTES

Effluent Meter is not currently working. Upstream Screening - Bar Screens (FMC). Float system is used as a back up to the transducer. Pump station pumps directly to the headwork's of the WWTP. Flow is metered at the headwork's of the WWTP. West Pottsgrove and portions of the Borough contribute to the PS. Pump #4 only 200-300 gpm

Generator can service dry weather flows for approximately 3-4 days. Dual wet well with baffle to collect grease. PS has a dimminutor and runs continuously. It was stated

SITE PHOTOGRAPHS

PUMP STATION INSPECTION - POTTSTOWN

PUMP STATION NAME
Old Reading

INSPECTION DATE	INSPECTION TIME		INSPECTION CREW	JMT Project #
4/11/2014	1:30	AM PM	JES	13-1117-001

SITE ADDRESS/ LOCATION	MUNICIPALITY/OWNER
Old Reading Pike	West Pottsgrove Township

GENERAL INFORMATION

VFD	Total No. of Pumps	No. of Primary Pumps	No. of Standby Pumps	Pump Manufacture
YES NO	2	1	1	Fairbanks Morse

Pump Type	Average Flow (MGD)	Generator	Wet Well		Pump Model
Centrifugal	0.806	YES NO	Shape	Square	

Pump Size	Max Flow (MGD)	Generator Power	Wet Well		Influent Pipe Size(s)	Effluent Pipe Sizes(s)
560 gpm		Diesel	Size		10"	8"
			Dry Well	Yes		

Pump Station Power Phase	SCADA	Upstream Screening	Valve Vault	Bypassing Option	Effluent Metering
3	YES NO	YES NO	YES NO	YES NO	YES NO

Year Constructed	Year of Upgrades	FOG Issues	Recorded Overflows	Float System		
	1984	YES NO	YES NO	ON High	OFF Low	Alarm Low Low

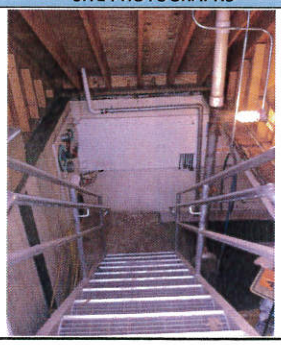
Oder Control	ROUTINE MAINTENANCE
YES NO	

NOTES

The wet well is flushed once a month. A probe with contacts is used as pump control.

Wet well is approx. 30-40 feet deep. Existing hatch was replaced and a small building was constructed for easier access.

SITE PHOTOGRAPHS



PUMP STATION INSPECTION - POTTSTOWN

PUMP STATION NAME
Pine Ford

INSPECTION DATE	INSPECTION TIME		INSPECTION CREW	JMT Project #
4/11/2014	2:15	AM **PM**	JES	13-1117-001

SITE ADDRESS/ LOCATION	MUNICIPALITY/OWNER
Pine Ford Road	Upper Pottsgrove Township

GENERAL INFORMATION

VFD	Total No. of Pumps	No. of Primary Pumps	No. of Standby Pumps	Pump Manufacture
YES NO	2	1	1	Fairbanks Morse

Pump Type	Average Flow (MGD)	Generator	Wet Well		Pump Model
Submersible	0.078	**YES** NO	Shape	Round	

Pump Size	Max Flow (MGD)	Generator Power	Wet Well		Influent Pipe Size(s)	Effluent Pipe Sizes(s)
		Diesel	Size	8 foot	(2) 8"	5"
			Dry Well			

Pump Station Power Phase	SCADA	Upstream Screening	Valve Vault	Bypassing Option	Effluent Metering
3	YES **NO**	YES **NO**	**YES** NO	YES **NO**	YES **NO**

Year Constructed	Year of Upgrades	FOG Issues	Recorded Overflows	Float System		
1996	2011	**YES** NO	YES **NO**	**ON** **High**	**OFF** **Low**	**Alarm** **Low Low**

Oder Control	ROUTINE MAINTENANCE
YES **NO**	Grease is pumped out every 4-6 months

NOTES

New pumps and VFD's installed in upgrade in 2011. Pump control is a transducer with a float back-up. No meter at station, flow is metered at the intersection of Farmington and Wilson. Township uses a tow truck to remove pumps because hoist is under sized for pumps.

Station has experienced one power outage in past 5 years.

SITE PHOTOGRAPHS

PUMP STATION INSPECTION - POTTSTOWN

PUMP STATION NAME
Porter Road

INSPECTION DATE	INSPECTION TIME		INSPECTION CREW	JMT Project #
4/11/2014	10:00	**AM**	JES	13-1117-001
		PM		

SITE ADDRESS/ LOCATION	MUNICIPALITY/OWNER
Porter Road	Lower Pottsgrove Township

GENERAL INFORMATION

VFD		Total No. of Pumps	No. of Primary Pumps	No. of Standby Pumps	Pump Manufacture
	YES				
	NO	4	2	2	

Pump Type	Average Flow (MGD)	Generator	Wet Well		Pump Model
	2 MGD	**YES**	Shape		
		NO			

Pump Size	Max Flow (MGD)	Generator Power			Influent Pipe Size(s)	Effluent Pipe Sizes(s)
			Size			
(2) 60 hp; (2) 200 hp	13 MGD	Diesel	Dry Well	No	30"	10"; (2) 18"

Pump Station Power Phase	SCADA	Upstream Screening	Valve Vault	Bypassing Option	Effluent Metering
	YES	**YES**	YES	YES	**YES**
3	NO	NO	**NO**	**NO**	NO

Year Constructed	Year of Upgrades	FOG Issues	Recorded Overflows	Float System		
		YES	**YES**	ON	OFF	Alarm
	1993	**NO**	NO	High	Low	Low Low

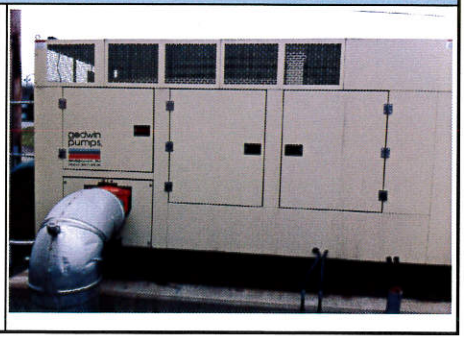
Oder Control	ROUTINE MAINTENANCE
YES	Cleaning occurs every 3-4 years.
NO	

NOTES

Pump Station has a very small wetwell. Pump Station collects flows from LPGT and western portions of the Borough. Sanatoga Pump Station pumps into 18" FM. Station has a back-up diesel pump for wet weather events. Hydraulic muffin monster is used as upstream screening.

During normal operations (dry-weather), the pump station utilizes one 18-inch force main; as flow increases, the other 18 inch line activates. Only 2 pumps can run at one time. The 10 inch line is used to alternate or supplement with the other 18 inch lines as needed. The new (2011) 18 inch force main has a control valve that modulates flow and is set such that the maximum flow cannot exceed 11,800 gpm per the agreement.

SITE PHOTOGRAPHS



PUMP STATION INSPECTION - POTTSTOWN

PUMP STATION NAME
Regal Oaks

INSPECTION DATE	INSPECTION TIME		INSPECTION CREW	JMT Project #
4/11/2014	2:30	AM PM	JES	13-1117-001

SITE ADDRESS/ LOCATION	MUNICIPALITY/OWNER
Boxwood Court	Upper Pottsgrove Township

GENERAL INFORMATION

VFD	Total No. of Pumps	No. of Primary Pumps	No. of Standby Pumps	Pump Manufacture
YES NO	2	1	1	Fairbanks Morse

Pump Type	Average Flow (MGD)	Generator	Wet Well		Pump Model
Submersible		YES NO	Shape	Round	

Pump Size	Max Flow (MGD)	Generator Power			Influent Pipe Size(s)	Effluent Pipe Sizes(s)
1500 gpm		Diesel	Size	8 foot	12"	12"
			Dry Well	No		

Pump Station Power Phase	SCADA	Upstream Screening	Valve Vault	Bypassing Option	Effluent Metering
3	YES NO	YES NO	YES NO	YES NO	YES NO

Year Constructed	Year of Upgrades	FOG Issues	Recorded Overflows	Float System		
2010	N/A	YES NO	YES NO	ON High	OFF Low	Alarm Low Low

Oder Control	ROUTINE MAINTENANCE
YES NO	

NOTES

Prior to 2010 this pump station was a WWTP. PS serves Holly berry Court, 75 homes. Township utilizes a tow stuck to pull pumps because job crane is undersized for pumps. PS has a ragging problem.

SITE PHOTOGRAPHS

PUMP STATION INSPECTION - POTTSTOWN

PUMP STATION NAME
Villa Drive

INSPECTION DATE	INSPECTION TIME		INSPECTION CREW	JMT Project #
4/11/2014	11:30	AM	JES	13-1117-001
		PM		

SITE ADDRESS/ LOCATION	MUNICIPALITY/OWNER
Villa Drive	Lower Pottsgrove Township

GENERAL INFORMATION

VFD	Total No. of Pumps	No. of Primary Pumps	No. of Standby Pumps	Pump Manufacturer
YES / NO	2	1	1	Hydromatic (7.5hp)

Pump Type	Average Flow (MGD)	Generator	Wet Well		Pump Model
Grinder		YES / NO	Shape	Round	

Pump Size	Max Flow (MGD)	Generator Power	Wet Well		Influent Pipe Size(s)	Effluent Pipe Sizes(s)
100 gpm		N/A	Size	5 foot	8"	4"
			Dry Well	No		

Pump Station Power Phase	SCADA	Upstream Screening	Valve Vault	Bypassing Option	Effluent Metering
3	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

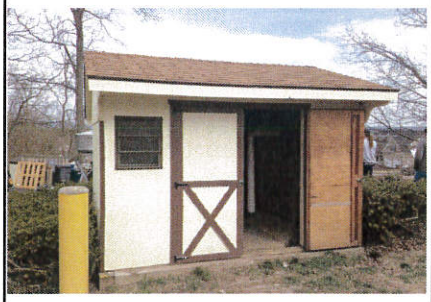
Year Constructed	Year of Upgrades	FOG Issues	Recorded Overflows	Float System		
1982		YES / NO	YES / NO	ON / High	OFF / Low	Alarm / Low Low

Oder Control	ROUTINE MAINTENANCE
YES / NO	

NOTES

Current project to include adding back-up float system to the correct transducer. All domestic wastewater flow from development. Pumps to Porter Road PS.

SITE PHOTOGRAPHS



PUMP STATION INSPECTION - POTTSTOWN

PUMP STATION NAME
Sanatoga Lake

INSPECTION DATE	INSPECTION TIME		INSPECTION CREW	JMT Project #
4/11/2014	11:00	AM PM	JES	13-1117-001

SITE ADDRESS/ LOCATION	MUNICIPALITY/OWNER
South Sanatoga Road	Lower Pottsgrove Township

GENERAL INFORMATION

VFD	Total No. of Pumps	No. of Primary Pumps	No. of Standby Pumps	Pump Manufacturer
YES **NO**	2	1	1	Fairbanks Morse (75hp)

Pump Type	Average Flow (MGD)	Generator	Wet Well		Pump Model
Submersible	0.43	**YES** NO	Shape	Round	

Pump Size	Max Flow (MGD)	Generator Power	Wet Well		Influent Pipe Size(s)	Effluent Pipe Sizes(s)
1500 gpm	3.17	Diesel	Size		18"	16"
			Dry Well	No		

Pump Station Power Phase	SCADA	Upstream Screening	Valve Vault	Bypassing Option	Effluent Metering
3	YES **NO**	**YES** NO	**YES** NO	YES **NO**	YES **NO**

Year Constructed	Year of Upgrades	FOG Issues	Recorded Overflows	Float System		
1993	2012	YES **NO**	YES **NO**	ON High	OFF Low	Alarm Low Low

Oder Control	ROUTINE MAINTENANCE
YES **NO**	

NOTES

Muffin Monster (Hydraulic). Station includes a Godwin 3,000 gpm diesel pump for wet weather use. There is a project to update the pumps to 125hp with VFD's. A bubbler is used as pump control. The station utilizes an auto dialer for an alarm system.

There is currently a connection ban upstream of this PS due to its capacity constraints.

SITE PHOTOGRAPHS

Appendix T

0015

Pottstown
New Horizons Forged From A Rich Past

Invoice

Invoice Number	68346
Invoice Date	04/07/2014
Customer Number	705

Borough of Pottstown
Attn: Finance Dept.
100 East High Street
Pottstown, PA 19464
610-970-6500

Payment Terms **Open Terms**

RECEIVED
APR 08 2014

#Lower Pottsgrove Twp
WW Annual Contribution
2199 Buchert Rd
Pottstown PA 19464

Payable to: Borough of Pottstown, attn: Finance Dept., 100 E. High St., Pottstown, PA 19464

Description	Amount
Partial invoice 2013 WWTP Modifications	$16,229.00

DATE 4-14-14
FUND Sewer Cap Res PLGIT
ACC'T # 429.69
INITIAL
CHECK # 251

Current Invoice Total **$16,229.00**

Cut here and send invoice coupon with payment

Cut here and send invoice coupon with payment

Invoice Coupon

Invoice Number 68346
Invoice Date 04/07/2014
Customer # 705

Partial invoice 2013 WWTP Modifications $16,229.00

Remit to:
Borough of Pottstown
Attn: Finance Dept.
100 E. High St.
Pottstown, PA 19464

Current Invoice Total **$16,229.00**

Pottstown Borough Authority
WWTP Active Projects
April 3, 2014

Project Number		#1291	#1292	#1294	#2300
Project Name		Memorial Park Meter	Lower Pump House	Circle of Progress Meter	WWTP Modifications 2013
Estimated Total Project Cost		(a)	(a)	(a)	1,516,000
Project Actual Costs	**Scope of Work**				
BCM	Authority Engineer	6,265	5,954	5,059	60,249
MGK	Test Pit				1,000
Commonwealth Of PA	Permits				500
Total Cost		6,265	5,954	5,059	61,749
Anticipated Completion Date		2014	2014	2014	2015

(a) total cost for metering projects is $417,500. Cost of Memorial Park will be split 50/50 between Borough and WPT. Lower Pump House metering to be split 80/20 between Borough and LPT. Circle of Progress is 100% borough.

	Requested Purchased Capacity	Allocation %
Pottstown	9.3079%	59.67%
Lower Pottsgrove Township	4.1000%	26.28%
West Pottsgrove Township	1.6000%	10.26%
Upper Pottsgrove Township	0.5921%	3.80%
	15.6000%	100.00%

4/2/20144:20 PM

Pottstown
New Horizons Forged From A Rich Past

Invoice

Invoice Number	67810
Invoice Date	04/01/2014
Customer Number	705

Borough of Pottstown
Attn: Finance Dept.
100 East High Street
Pottstown, PA 19464
610-970-6500

Payment Terms **Open Terms**
08364600

Revised 2QTR

#Lower Pottsgrove Twp
WW Annual Contribution
2199 Buchert Rd
Pottstown PA 19464

RECEIVED
APR 0 4 2014

Payable to: Borough of Pottstown, attn: Finance Dept., 100 E. High St., Pottstown, PA 19464

Description	Amount
Lower Pottsgrove O & M contribution 2nd Qu 2014-Due 4/30/14	$115,804.00
Credit Memo # 48491 - 2013 Final O&M Rec	<60,247.00>

ITEM
FUND SEWER
ACC'T # 489.45
INITIAL
CHECK #

Current Invoice Total ~~$115,804.00~~ 55,557.00

Cut here and send invoice coupon with payment

Cut here and send invoice coupon with payment

Invoice Coupon

Invoice Number 67810
Invoice Date 04/01/2014
Customer # 705

Lower Pottsgrove O & M contribution 2nd Qu 2 ~~$115,804.00~~ 55,557.00

Remit to:
Borough of Pottstown
Attn: Finance Dept.
100 E. High St.
Pottstown, PA 19464

Current Invoice Total ~~$115,804.00~~ 55,557.00

BOROUGH OF POTTSTOWN
100 E. High Street

Pottstown PA 19464
Phone: 610-970-6500

APR - 4 2014

CREDIT MEMO

Date	Number	Page
04/02/2014	48491	1

Bill To: #Lower Pottsgrove Twp
WW Annual Contribution
2199 Buchert Rd
Pottstown PA 19464

Customer No. 705

Contact:

Quantity	Description	Unit Price	Net Amount
-1	2013 final O & M Rec	60,247.00	60,247.00 CR

Amount	60,247.00 CR
Freight	
Balance Due	60,247.00 CR

BOROUGH OF POTTSTOWN
WASTEWATER COLLECTION

To: Robert Plenderleith, Finance Department

RECEIVED
DEC 16 2013

From: Chris Bowyer, BCM Engineers

Date: December 12, 2013

Re: Lower Pottsgrove Township Sewage Flows, November, 2013

The following number of gallons of sewage have been recorded.
Current Month time period 11/1/13 to 11/30/13

Meter Location	Current Month	Year to Date
Porter Road 18-inch (LPT1)	32,507,438	540,694,532
Porter Road 10-inch (LPT2)	94,291	1,604,500
Porter Road 16-inch (LPT16)	1,381,954	24,696,450
Home Depot P.S. (LPT3)	36,291	359,219
Industrial Highway (LPT4)	702,570	7,316,537
422 Sports Center (LPT5)	179,453	712,845
Glenn Springs Holdings	55,909	760,755
Total Flow	34,957,906	576,144,838
Pottstown Boro' North End	*(2,808,643)*	*(36,407,948)*
Upper Pottsgrove Turnberry	*(885,087)*	*(9,764,565)*
Net Lower Pottsgrove Flow	31,264,177	529,972,325
WWTP Effluent	124,454,000	1,931,787,000

Comments:

LPT3 estimated 11/1 thru' 11/8 and 11/10 thru' 11/12 using previous 12 month average (notified of problem on 11/7/13)
LPT4 estimated using previous annual average (notified of problem on 10/29/13)
Remaining meter data provided by Township.

cc: Doug Yerger, Pottstown Borough
Rod Hawthorne, Lower Pottsgrove
Rich Yoder, Lower Pottsgrove
Chad Camburn, Bursich Consultants

BOROUGH OF POTTSTOWN
WASTEWATER COLLECTION

To: Robert Plenderleith, Finance Department

From: Chris Bowyer, BCM Engineers

Date: January 1, 2014

Re: Lower Pottsgrove Township Sewage Flows, December, 2013

The following number of gallons of sewage have been recorded.
Current Month time period 12/1/13 to 12/31/13

Meter Location	Current Month	Year to Date
Porter Road 18-inch (LPT1)	78,114,845	618,809,376
Porter Road 10-inch (LPT2)	279,792	1,884,292
Porter Road 16-inch (LPT16)	5,108,803	29,805,254
Home Depot P.S. (LPT3)	46,901	406,120
Industrial Highway (LPT4)	725,989	8,042,526
422 Sports Center (LPT5)	12,600	725,445
Glenn Springs Holdings	74,704	835,459
Total Flow	84,363,634	660,508,472
Pottstown Boro' North End	*(4,953,344)*	*(41,361,291)*
Upper Pottsgrove Turnberry	*(1,021,934)*	*(10,786,499)*
Net Lower Pottsgrove Flow	78,388,356	608,360,682
WWTP Effluent	239,125,000	2,170,912,000

Comments:

LPT4 estimated using previous annual average (notified of problem on 10/29/13)
Remaining meter data provided by Township.

cc: Doug Yerger, Pottstown Borough
Ed Wagner ~~Rod Hawthorne~~, Lower Pottsgrove
Rich Yoder, Lower Pottsgrove
Chad Camburn, Bursich Consultants

BOROUGH OF POTTSTOWN
WASTEWATER COLLECTION

To: Robert Plenderleith, Finance Department

From: Chris Bowyer, BCM Engineers

Date: February 12, 2014

Re: Lower Pottsgrove Township Sewage Flows January, 2014

The following number of gallons of sewage have been recorded.
Current Month time period 1/1/14 to 1/31/14

Meter Location		Current Month	Year to Date
Porter Road 18-inch	(LPT1)	64,448,986	64,448,986
Porter Road 10-inch	(LPT2)	174,024	174,024
Porter Road 16-inch	(LPT16)	4,560,235	4,560,235
Home Depot P.S.	(LPT3)	54,605	54,605
Industrial Highway	(LPT4)	725,989	725,989
422 Sports Center	(LPT5)	21,528	21,528
Glenn Springs Holdings		84,724	84,724
Total Flow		70,070,091	70,070,091
Pottstown Boro' North End		*(4,420,724)*	*(4,420,724)*
Upper Pottsgrove Turnberry		*(1,012,157)*	*(1,012,157)*
Net Lower Pottsgrove Flow		64,637,210	64,637,210
WWTP Effluent		221,838,000	221,838,000

Comments:

LPT4 estimated using previous annual average (notified of problem on 10/29/13)
Remaining meter data provided by Township.

cc: Doug Yerger, Pottstown Borough
Ed Wagner, Lower Pottsgrove
Rich Yoder, Lower Pottsgrove
Chad Camburn, Bursich Consultants

RECEIVED
FEB 18 2014

BOROUGH OF POTTSTOWN
WASTEWATER COLLECTION

RECEIVED
APR 1 4 2014

To: Robert Plenderleith, Finance Department

From: Chris Bowyer, BCM Engineers

Date: April 10, 2014

Re: Lower Pottsgrove Township Sewage Flows March, 2014

The following number of gallons of sewage have been recorded.
Current Month time period 3/1/14 to 3/31/14

Meter Location		Current Month	Year to Date
Porter Road 18-inch	(LPT1)	77,738,774	223,735,306
Porter Road 10-inch	(LPT2)	269,208	773,971
Porter Road 16-inch	(LPT16)	5,911,387	22,051,426
Home Depot P.S.	(LPT3)	40,371	146,962
Industrial Highway	(LPT4)	725,989	2,107,710
422 Sports Center	(LPT5)	10,181	43,877
Glenn Springs Holdings		63,289	205,576
Total Flow		84,759,199	249,064,827
Pottstown Boro' North End		*(4,992,865)*	*(15,197,381)*
Upper Pottsgrove Turnberry		*(1,036,477)*	*(3,002,476)*
Net Lower Pottsgrove Flow		78,729,858	230,864,970
WWTP Effluent		261,329,467	760,037,467

Comments:

LPT4 estimated, using previous annual average (notified of problem on 10/29/13)
Home Depot estimated, using previous annual average, 3/13 - 3/31
Remaining meter data provided by Township.

cc: Doug Yerger, Pottstown Borough
Ed Wagner, Lower Pottsgrove
Rich Yoder, Lower Pottsgrove
Chad Camburn, Bursich Consultants

Appendix U

Private Sewer Laterals

A private sewer lateral (PSL) is the section of underground pipe that connects the sewage system in a house or building (the wastewater plumbing) to the utility owned and maintained sanitary sewer collection system (sewer system) in streets or easements. As the name implies, the private sewer lateral is a pipe that is owned and maintained by the private property owner. It is outside the utility's right-of-way. The private sewer lateral is the responsibility of the homeowner to maintain and repair.

As sewer system age, structural defects in sewer pipes and manholes, primarily old pipes and manholes, allow unwanted storm water Infiltration and Inflow (I&I) to overload the sewage system. When the underground sewer pipes are overloaded with unwanted I&I, some of the sewage, diluted by I&I, overflows at various points without treatment. To control the overflows, the defective pipes must be repaired or replaced to eliminate the source of the Infiltration and Inflow.

At has been estimated, in some systems that as much as 80% of I/I comes from PSLs.

Until recently, there has been little guidance available to public works agencies for determining the top-performing, most cost-effective inspection and rehabilitation options for sewer laterals in specific conditions. This guidance is available in a WERF, *Methods for Cost-Effective Rehabilitation of Private Lateral Sewers* . The report attempts to provide a clear understanding of the relevant financial and legal issues surrounding laterals rehabilitation and explains available options for inspection, evaluation, and repair. By addressing both sides of the rehabilitation equation, the project is able to better inform those who formulate policy recommendations and provide a sound course of action on how to manage problems with sewer laterals in their community.

The project, led by the Trenchless Technology Center at Louisiana Tech University and supported by individuals from Black & Veatch, Wade and Associates, Computer Associates, and the Johnson County, Kansas, legal department, began with a comprehensive questionnaire to which 58 municipalities and other public works agencies responded. Although the response was small in comparison to the more than 17,000 agencies estimated to exist in the United States, the survey sampling represents a wide range in size (from 2,000 laterals to over a million) and existing local conditions. The survey provides comprehensive insight into the diversity of existing conditions and working practices in dealing with sewer laterals.

Drawing the Line

One fact that the project's survey revealed is that private ownership of sewer laterals extends more often to the mainline than to the property line, which profoundly affects the current working practices regarding sewer laterals in public works agencies. Because of the private ownership of all or a portion of lateral services, planning and managing lateral inspection and rehabilitation requires specific legal and financial considerations. Spending public funds on private property is a frequently raised issue. Many states have general prohibitions against the use of public funds for the improvement of private property, though a number of court cases have affirmed that, provided there is an important public benefit to a project, some incidental benefit to private property owners can be permissible. Therefore, having a good record of the exact location and layout of laterals is essential whenever any excavation, new installation, or rehabilitation is to be performed.

The research team found that the most accurate method to identify the layout and depth of the lateral over its entire length uses a pipe and cable locator along with in-pipe sonde technology. This technology entails inserting a small transmitter in an underground pipe until it is stopped by a blockage. The transmitter and area for repair are then precisely located using the pipe and cable locator.

Ground-penetrating radar was also found to be reliable, in adequate soil conditions. Although it is applied infrequently, its use is increasing as the cost drops and ease of use improves. Some sewer inspection methods may also provide information about lateral location. Dye water testing is, for example, useful in identifying multiple laterals from a house.

Leaking Secrets

Various drain connections to sanitary sewers present inflow sources that can significantly contribute to infiltration and inflow (I/I) problems. Drain disconnect programs are often cost effective and the first step agencies take in reducing I/I into the sewer system. But should an agency need to go in for a closer look, several technologies exist to aid inspection. The research team compiled information received from manufacturers about inspection systems on the U.S. market, and outlined for each system the required access into the lateral, pipe diameters and lengths that can be inspected, resolution, and self-leveling options.

Closed circuit television (CCTV) is a common technology capable of identifying location and size of active leaks, as well as some inactive leaks (water stains), change in pipe material/diameter along the lateral, sags, and bends. Pressure testing (air pressure or water exfiltration testing), however, is the most reliable method to identify the existence of both active and passive leaks and, when applied in a sequential process, can identify the approximate location of leaks.

Back to Rehab

An important question for programmatic decision making is whether lateral rehabilitation is really necessary. Most municipalities have problems with I/I and want to know to what degree laterals are responsible. The survey revealed that 45% of participating agencies had analyzed how much private sewer laterals contribute to total I/I in their wastewater systems and that the average of the estimates was in the range of 40% with one estimate as high as 80%. Although such estimates are valuable as an indication of the magnitude of the problem in general, most of them were admittedly educated guesses.

Different methods are available for agencies to rehabilitate sewer laterals. The survey showed that most popular trenchless methods are pipe bursting and CIP relining and that almost every other agency has used one or both of these methods on sewer laterals. Other already proven methods include chemical grouting, flood grouting, and robotic repairs, whereas a new method just being introduced is slug grouting. The WERF report again provides detailed data about currently available technologies in the U.S. market, which was provided by manufacturers. The research did not involve any field or laboratory testing of methods/technologies, so relevant assessments of these technologies were sought from municipalities or other independent sources.

The Trenchless Technology Center was able to identify only a few agencies with pertinent I/I studies completed and data and findings available for the study. The quantitative data and reduction estimates from these studies are included in the report and vary by whether total volume reduction or peak flow reduction is considered. A number of I/I studies were still ongoing at the time of completion of the research. The research team is looking into adding this additional data to a future version of the report to provide more comprehensive guidance on the potential savings from laterals rehabilitation projects.

Solution Approaches

A review of utility web sites identifies a number of approaches to dealing with I/I reduction that involve PSLs. These approaches fall into three categories:

1. Utility Repairs PSL

Starting in the late 1980s ending in 1995, Stege Sanitary District conducted a targeted I/I reduction program that involved digging up and replacing PSLs in a high I/I area known as Subarea N that included 111 homes. Since Federal funds could not be used to replace private laterals, the project was funded on a PAYGO basis out of utility funds. In addition to achieving compliance with the state order to reduce I/I Stege won the CWPCA and California CWEA awards for best collection system in 1988, 1990, 1991, 1995 and 1998. Stege's current approach to I/I reduction involving PSLs (Certificate of Compliance) is described in 3, below.

2. Penalty Assessments Coupled With Financial Incentives

McMinnville, Oregon utilizes penalty assessments to incentivize private homeowners to make repairs to defective PSLs. The details of the program (as extracted from the McMinnville web site) is attached in Appendix A.

Property owners who choose to not replace their defective private sewer lateral are faced with paying a $50 per month penalty until the lateral is replaced. Property owners who choose to not replace their defective lateral and also not pay the $50 per month assessments will be subject to further civil penalties and possible legal action, as allowed by City Ordinance. The cost of not complying can become significant for both the property owner and the City.

The McMinnville City Council has made available a monetary incentive that is part of the private sewer lateral replacement program. Those property owners who take advantage of the City's incentive offer will be reimbursed 10% of their construction cost up to a maximum of $250. To be eligible, property owners must construct an acceptable lateral replacement within the 90-day grace period and submit a written request as application for reimbursement.

The McMinnville City Council has made a program available to property owners who may have trouble finding financial assistance through banks or other lending agencies. This program is only available to homeowners who accept responsibility for the repair of their private sewer lateral and requires the property owner to sign a contract with the City for installment payments.

3.Certificate of Compliance

Effective October 18, 2011, EBMUD Regional Ordinance governed within Stege Sanitary District's service area as it relates to Sewer lateral Compliance. EBMUD implements and manages all aspects of this program including record keeping, maintaining written procedures for verification testing, witnessing all verification testing and issuing Compliance Certificates to compliant private sewer laterals - Appendix B contains additional details..

Property owners are required to obtain a “Certificate of Compliance” for their sewer laterals upon transfer

of title (sale of property), significant remodel of $100,000 or more, or increase in water meter size. To obtain a Certificate of Compliance, the property owner must contact EBMUD directly to schedule an inspection, in addition the property owner must also obtain a sewer permit from Stege Sanitary District for any sewer related construction work.

Appendix A

McMinnville, Oregon

Wastewater Services: Conveyance System Sewer Lateral FAQ

Q:What is a private sewer lateral?

A:A private sewer lateral is the section of underground pipe that connects the sewage system in a house or building (the wastewater plumbing) to the City owned and maintained sanitary sewer collection system (sewer system) in streets or easements. As the name implies, the private sewer lateral is a pipe that is owned and maintained by the private property owner. It is outside the City's right-of-way. The private sewer lateral is the responsibility of the homeowner to maintain and repair, just as the roof on a house is the homeowner's responsibility to maintain and repair.

Q:Why was my private sewer lateral evaluated by the City?

A:The City has been directed by EPA and the Oregon Department of Environmental Quality (DEQ) to control the overflow of untreated sewage into the Yamhill River, which occurs frequently during the rainy season. The City has hired experts on this subject who have monitored and analyzed our system in order to understand the cause of the problem. They have determined that the City has a sewage system that is, in some areas, severely deteriorated. Structural defects in sewer pipes and manholes, primarily old pipes and manholes, allow unwanted storm water Infiltration and Inflow (I&I) to overload the sewage system. When the underground sewer pipes are overloaded with unwanted I&I, some of the sewage, diluted by I&I, overflows into the river without treatment. To control the overflows, the defective pipes must be repaired or replaced to eliminate the source of the Infiltration and Inflow.

Our experts estimate that approximately 60% of McMinnville's I&I comes from private sewer laterals. Private sewer lateral I&I can come from broken pipes which allow groundwater to infiltrate or it comes from rainwater inflow from things like roof downspouts, basement drains, or area drains that are connected to the private sewer lateral. The City cannot ignore such a significant part of McMinnville's overflow problem. Defective private sewer laterals need to be replaced or we will never meet our overflow control objective.

The City is primarily enforcing the private sewer lateral replacement program in the areas of town where the City's pipes are repaired and/or replaced first. Properties will not be randomly selected for evaluation. The properties evaluated will usually be part of a comprehensive pipeline repair project in a specific area of McMinnville but there will be some exceptions such as when a significant defect outside of a project area is brought to our attention. The City will continue this program, moving from one area to another, for the next 10 to 20 years. The parts of McMinnville that have the most significant overflow problems are the areas that will be addressed first.

Q:How do I replace my lateral? Who do I hire to do this work? Who pays for the repairs?

A:The McMinnville City Council has adopted a policy whereby property owners in McMinnville are responsible for replacing their private sewer lateral if it is defective and it is contributing to the sewage overflow problem. The cost to replace a defective private sewer lateral is borne by the property owner.

Those property owners who choose to replace their private sewer lateral, and avoid the monthly penalty assessment, will need to obtain a permit for this work from the City. Installation of a new or replacement of an existing private sewer lateral has always required a permit from the City. With the permit comes a

number of requirements as follows:

- A minimum fee of $30 is charged for the permit. The permit fee can increase depending on the scope of the work. The exact fee will be determined when the application for permit is made based on the number of feet of pipe to be replaced. The applicant should determine how many feet of pipe need to be replaced prior to making the permit application.
- The work must comply with the requirements of the current plumbing code.
- The work must be done by either the property owner or a licensed contractor.
- The new pipeline must be inspected by the City before it is covered with soil.

The City strongly recommends that property owners use a licensed contractor to do this work. There are a number of qualified contractors in the local area, and many more are located in the Portland and Salem areas. One place to locate a contractor is the yellow pages. Refer to listings under "Contractors - General" or "Excavating Contractors". The City also keeps a list of local contractors. Another way to find a good contractor is by asking friends or family for recommendations. The City will not recommend specific contractors.

If you use a contractor, the City recommends that you consider the following points:

1. Get at least three estimates. It is OK to shop around. Price quotes from contractors may vary. If possible, give each contractor a copy of the City's letter describing your defective lateral condition so they each have the same information about your property. The lowest price is not always the best contractor. Select the contractor who you think will give you the best product at the best price. Usually contractors provide estimates at no charge.
2. Get written estimates. Make sure you have a firm price in hand, with a detailed description of the work, before you sign an agreement for construction. Make sure restoration of your property to its original condition is part of their work. Make sure the contractor commits to a time frame in the written agreement. Remember that the City's 10% reimbursement is tied to a fixed time. Make sure your contractor meets that time frame.
3. Ask for references. As with any purchase you make, especially one this significant, do everything you can up front to make sure you are making the best choice.
4. Be satisfied with the results, or don't pay. The property owner has some control over the performance of the contractor. For example, if you are not satisfied with his or her work (in particular, restoration of your property) don't pay until the work meets the conditions of your agreement. We strongly recommend that you do not pay until the City's inspector accepts the permitted work by signing off on the permit.

Q: How much will it cost to comply with this program?

A: A typical private sewer lateral replacement will cost somewhere in the range of $1,500 to $2,500. The costs can increase significantly if there are obstructions to the contractor such as extensive landscaping, driveways, or structures built over the lateral. Some contractors have "no-dig" equipment available to them that would allow them to do the work without digging up your property. The "no-dig" techniques usually cost more.

Property owners who choose to not replace their defective private sewer lateral are faced with paying a $50 per month penalty until the lateral is replaced. For example, it would take 40 months (3 years and 4 months) for the accumulation of penalties to equal the replacement cost of a $2,000 lateral.

Property owners who choose to not replace their defective lateral and also not pay the $50 per month assessments will be subject to further civil penalties and possible legal action, as allowed by City Ordinance. The cost of not complying can become significant for both the property owner and the City.

Q: Can the collection of penalty assessments be suspended?

A: The McMinnville City Council has adopted a penalty program of $50 per month to be assessed against those property owners who choose not to replace their defective private sewer laterals at all, or who choose not to replace their defective private sewer laterals within a 90 calendar day grace period. The penalty is in addition to the normal monthly sewer bill. The penalty assessments do not begin until after the grace period. It is important to note that property owners who replace their private sewer laterals during the grace period not only avoid the penalty assessment, they also are eligible for a 10% rebate of their cost from the City up to a maximum of $250.

At the property owner's request, the City may suspend collection of penalties for up to 10 months to allow the property owners time to complete the work. The suspension period begins after the grace period. Repairs made during or after the suspension period are not eligible for the grace period rebate program. Penalties continue to accrue during the suspension period and the penalty is due in full at the end of the period if the repairs are not made. If the lateral is replaced and accepted by the City before the end of the suspension period, the penalty is waived.

Q: If I replace my lateral within the 90-day grace period, how do I get the 10% incentive payment from the city?

A: The McMinnville City Council has made available a monetary incentive that is part of the private sewer lateral replacement program. Those property owners who take advantage of the City's incentive offer will be reimbursed 10% of their construction cost up to a maximum of $250. To be eligible, property owners must construct an acceptable lateral replacement within the 90-day grace period (refer to section above for information on how to construct). Property owners must submit a written request as application for reimbursement. The request must include:

1. The name and mailing address of property owner.
2. The address and/or tax lot number of the property.
3. Certification that the repairs were not paid for by a renter, lessor, or any other person (If a renter, or lessor, is responsible by separate agreement for this type of repair, submit a copy of that agreement for the City's review).
4. A copy of the contractor's invoice that itemizes project costs. This itemization should list separately the cost for excavation and burying pipe in the soil between the building and the connection to the lateral. This should include a breakdown of labor time, materials cost, and equipment.

This application should be made within 60 days of the City Building Division's acceptance of the new private sewer lateral. The City will issue you a check for the eligible amount after the request has been reviewed and processed. Typically this will be about three or four weeks from the receipt of the application.

Q: Will the City provide financial assistance for the repair cost?

A: The McMinnville City Council has made a program available to property owners who may have trouble finding financial assistance through banks or other lending agencies. This program is only available to homeowners who accept responsibility for the repair of their private sewer lateral and requires the property owner to sign a contract with the City for installment payments on the following basis:

1. The property owner shall select a licensed contractor to complete the required work and provide the City with a cost estimate of the work to be completed (refer to the information above about who to hire).
2. Prior to authorizing the contractor to proceed with the work, the property owner shall meet with the City Recorder or designee and sign an application and agreement to pay the repair costs based on

the estimate plus 25%. The application for installment payments shall be on the prescribed form and shall constitute a lien upon the property.

3. The application shall provide for a monthly payment for a period not to exceed 24 months. Interest shall accrue on the balance due at the prime interest rate plus 3.5%.
4. At the time of completion and inspection of the repair work the property owner will submit to the City Recorder or designee a detailed invoice breaking down the cost of the work and the total repair cost for review and approval before payment is made.
5. Once accepted, the City will issue a check jointly to both the property owner and contractor based on the actual billing submitted to the owner by the contractor. The monthly installment payment will be adjusted to reflect the actual repair cost. If repairs are made within the 90-day grace period, the monthly payment amount will be reduced to reflect any monetary incentive that applies to the property. A copy of the final loan amortization schedule will be provided to the property owner at the time the joint check is issued.

It is important to note that this is not a "low interest" loan. The City's private sewer lateral financial assistance program is provided primarily for individuals who may have trouble securing a loan from other sources. Most property owners will be able to find better interest rates and repayment periods from banks or lending agencies. The City strongly recommends that property owners evaluate other financing options before selecting the City's private sewer lateral financial assistance program.

Q:If I have a basement, should I be concerned about this work?

A:Yes. In older homes with basements it is not uncommon for the foundation drainage system to be connected to the private sewer lateral. Foundation drainage is a source of I&I and needs to be disconnected from the private sewer lateral. Our inspectors will be looking for foundation drain connections during inspections to make sure they are disconnected from the private sewer lateral when the lateral is replaced.

Property owners with basements will need to address their basement drainage systems when the private sewer lateral is replaced. This may require a second pipeline (a storm drainage lateral) out to the street to connect to the City's storm drainage system or it may require the installation of a basement pumping system with a discharge into the street at the curb. Unfortunately, the construction costs for homeowners with basements will generally be higher because the private sewer laterals are often deeper than a normal lateral and because of the possible need to address basement foundation drainage.

It is possible that some homes with basements that do not have water seepage problems now will discover water in their basements after the City completes the pipeline repairs in the street and/or after property owners repair their private sewer laterals. Other cities who have completed comprehensive sewer repair programs like McMinnville's program found that some of the old defective pipes kept groundwater levels low because the old pipe was porous and allowed ground water to drain in. Once defective leaking pipes are replaced with new tight pipe there is a risk that groundwater levels will rise and seep into basements. Correction of a basement leaking problem, should it occur, will be the responsibility of property owners.

Q:Do I need to disconnect my roof downspouts?

A:One of the private sewer lateral defects the City will be looking for during the evaluation is the connection of roof downspouts (also known as rainleaders). Similar to the need to disconnect basement foundation drains, roof downspouts also introduce unwanted I&I and must be disconnected. If downspout connections were identified during the City's inspection it will be noted in the defect notice to the property owner.

The disconnection of roof downspouts is a very simple process; basically the downspout needs to be separated from the buried pipe it feeds into. The old pipe needs to be sealed or removed, and a splash block should be placed under the end of the pipe to allow the rainwater to flow onto the ground without eroding

the soil under the downspout. Those property owners who do not want to deal with the additional water on their lawn or property should install a pipe that will carry the rainwater from the downspout to the street curb or to any area on their own property that will not be impacted by the additional rainwater runoff. Be very careful that rainwater runoff does not impact an adjoining property. Most of the contractors who do private sewer lateral replacement work will also be able to help with downspout disconnections and/or rerouting of rainwater runoff.

Q: Who do I contact for more information?

A: The City of McMinnville's engineering staff is prepared to answer any questions you have about this program. Their phone number is **503-434-7312**.

Appendix B
East Bay Municipal Utility District (EBMUD)

The United States Environmental Protection Agency (EPA) in collaboration with the California Regional Water Quality Control Board (RWQCB) is spearheading an effort to keep the Bay clean. The EPA and RWQCB are requiring the East Bay Municipal Utility District (EBMUD), six East Bay cities, and one sewer district to fix old, cracked sanitary sewer pipes to ensure they don't allow the infiltration of rainwater which can overwhelm wastewater treatment facilities, resulting in untreated or partially treated sewage being released into the Bay. As a result, EBMUD and its partners have phased in the East Bay Regional Private Sewer Lateral (PSL) Ordinance in some east bay communities. Affected property owners will be required to obtain a certificate from EBMUD indicating that their PSLs are without defects and have proper connections.

Effective Areas

The Ordinance is in effect in the following locations:

- Emeryville
- Oakland
- Piedmont
- Kensington
- El Cerrito
- Richmond Annex

Note: The cities of Alameda, Albany, and Berkeley are operating their own separate programs.

Program Start Dates

The Regional PSL Program start dates are listed below. The program is effective for escrows and building and remodeling permits opened on or after the program start date in each community or when a request is made to change the size of a water meter.

Location	Start Date
Emeryville and Piedmont	August 22, 2011
Stege Sanitary District (serving El Cerrito, Kensington, and Richmond Annex)	October 17, 2011
Oakland	January 16, 2012

Neighborhood Meetings: EBMUD, the EPA and municipal officials held neighborhood meetings to inform residents of the ordinance and assist with compliance. Meetings were held in Emeryville, Oakland, Piedmont and Stege Sanitary District (serving El Cerrito, Kensington and Richmond Annex). You may view a copy of the most recent presentation.

Regional PSL Ordinance Triggers

The Regional PSL Ordinance applies ONLY if you are buying or selling a property, building or remodeling in excess of $100,000, or changing the size of your water meter. Additionally, you may voluntarily have your PSL certified to be in compliance with the Regional PSL Ordinance when you are having work performed on the lateral without meeting any of the triggers.

PSL Exemptions from the Ordinance Triggers

Your PSL is exempt if it was fully replaced within the last 10 years and before August 2011 and you can provide valid evidence of the PSL replacement date. Follow the Guidelines for Exemption to obtain an exemption for your property.

PSL Program Fees

Effective July 1, 2013, and January 1, 2014, new PSL Program Fees will take effect. The increases and addition of new fees will cover the costs of administering the Regional PSL Program. Please find more information here.

Complying with the Regional PSL Ordinance

To receive a Compliance Certificate for your property demonstrating that all of the PSLs located on the property are without leaks and have proper connections, proceed to the guidelines and select the condition which applies to you.

Generally, to receive a Compliance Certificate, the following steps will be taken:

- Hire a contractor to inspect your PSL. Commonly, this consists of a closed-circuit television (CCTV) inspection allowing for the contractor and you to visually see the condition of your PSL, including instances of offset joints, root intrusion and cracked or broken pipe segments which would prevent your PSL from passing the verification test.

  Note: A copy of the CCTV inspection is NOT sufficient proof for obtaining a Compliance Certificate. A Compliance Certificate is only granted after passing a verification test.

- If necessary, have your PSL repaired or replaced.
- Schedule an inspection with EBMUD.
  Your contractor will set-up and administer the verification test per the provided guidelines. EBMUD will witness the test and confirm that your PSL is free of leaks.
- If your lateral does not pass the verification test, additional work will be required on your PSL. The verification test must be rescheduled with EBMUD.
- If your lateral is free of leaks, a Compliance Certificate will be available for you shortly thereafter.
- Download and print your Compliance Certificate.

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