Local Government Energy Audit:

Energy Audit Report

Pump Stations

North Hudson Sewerage Authority

500 River St.

Hoboken, New Jersey 07030

October 5, 2018

Final Report by:

TRC Energy Services

Disclaimer

The intent of this energy analysis report is to identify energy savings opportunities and recommend upgrades to the facility's energy using equipment and systems. Approximate saving are included in this report to help make decisions about reducing energy use at the facility. This report, however, is not intended to serve as a detailed engineering design document. Further design and analysis may be necessary in order to implement some of the measures recommended in this report.

The energy conservation measures and estimates of energy savings have been reviewed for technical accuracy. However, estimates of final energy savings are not guaranteed, because final savings may depend on behavioral factors and other uncontrollable variables. TRC Energy Services (TRC) and New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

Estimated installation costs are based on TRC's experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from *RS Means*. The owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Since actual installed costs can vary widely for certain measures and conditions, TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. The owner of the facility should review available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

Table of Contents

1 **Executive Summary** **1**

1.1 Facility Summary 1
1.2 Your Cost Reduction Opportunities 1

Energy Conservation Measures 1
On-Site Generation Measures 2

1.3 Implementation Planning 3

2 **Facility Information and Existing Conditions** **4**

2.1 Project Contacts 4
2.2 General Site Information 4
2.3 Building Occupancy 4
2.4 On-site Generation 5
2.5 Pump Stations 5

5th Street Pump Station 6
11th Street Pump Station 6
18th Street Pump Station 7
Baldwin Pump Station 8
Port Imperial Pump Station #1 9
Port Imperial Pump Station #2 9
Port Imperial Pump Station #3 10
49th Street Pump Station 11
Liberty Pump Station 11
H1 Pump Station 12

3 **Site Energy Use and Costs** **13**

3.1 Pumping Stations' Total Cost of Energy 13
3.2 Pumping Stations' Total Electricity Usage 14
3.3 Pumping Stations 15

5th Street Pump Station 15
11th Street Pump Station 16
18th Street Pump Station 17
Baldwin Pump Station 18
Port Imperial Pump Station #1 19
Port Imperial Pump Station #2 20
Port Imperial Pump Station #3 21
49th Street Pump Station 22
Liberty Pump Station 23
H1 Pump Station 23

3.4 Pumping Stations' Natural Gas Usage 24

18th Street Pump Station 25

3.5 Benchmarking 26
3.6 Energy End-Use Breakdown 26

4 **Energy Conservation Measures** **27**

4.1 Recommended ECMs 27
4.1.1 Lighting Upgrades 27
ECM 1: Retrofit Fluorescent Fixtures with LED Lamps and Drivers 28
ECM 2: Retrofit Fixtures with LED Lamps 29
5 On-Site Generation Measures 30
5.1 Photovoltaic 30
5.2 Combined Heat and Power 31
6 Demand Response 32
7 Project Funding / Incentives 33
7.1 SmartStart 33
7.2 Direct Install 34
7.3 Energy Savings Improvement Program 35
7.4 Demand Response Energy Aggregator 36
8 Energy Purchasing and Procurement Strategies 37
8.1 Retail Electric Supply Options 37
8.2 Retail Natural Gas Supply Options 37

Appendix A: Equipment Inventory & Recommendations

Table of Figures

Figure 1 – Previous 12 Month Utility Costs 2
Figure 2 – Potential Post-Implementation Costs 2
Figure 3 – Summary of Energy Reduction Opportunities 2
Figure 4 – Project Contacts 4
Figure 5 - Building Schedule 5
Figure 6 - Utility Summary 13
Figure 7 - Energy Cost Breakdown 13
Figure 8 - Electric Usage & Demand 14
Figure 9 - Electric Usage & Demand 14
Figure 10 - Natural Gas Usage 24
Figure 11 - Natural Gas Usage 24
Figure 12 - Energy Balance (% and kBtu/SF) 26
Figure 13 – Summary of Lighting Upgrade ECMs 27

1 Executive Summary

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for North Hudson Sewerage Authority (NHSA) pumping stations.

The goal of a LGEA is to provide you with information on how your facilities use energy, identify energy conservation measures (ECMs) that can reduce your energy use, and put you in a position to implement the ECMs. The LGEA also sets you on the path to receive financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing the ECMs.

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey North Hudson Sewerage Authority in controlling energy costs and protecting our environment by offering a full spectrum of energy management options.

1.1 Facility Summary

Ten NHSA pumping stations were included in this study with at total enclosed area of 10,800 square foot. The facilities vary from small buildings with pumps and bar screens to underground vaults.

Building Name	SF
5th Street Pump Station	1,000
11th Street Pump Station	750
18th Street Pump Station	5,000
Baldwin Pump Station	450
Port Imperial Pump Station #1	400
Port Imperial Pump Station #2	400
Port Imperial Pump Station #3	400
49th Street Pump Station (Underground Vault)	400
Liberty Place Pump Station (Underground Vault)	500
H1 Pump Station	1,500
Total:	**10,800**

The pumping stations mostly consists of centrifugal pumps with vertically mounted motors and aging and inefficient lighting. Most of the pumps are controlled by VFDs. Very few of the enclosed areas are conditioned, though all have exhaust fans. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated upgrading the lighting in the pump stations. The T12 florescent technology used in most locations is very old and it will become difficult to find replacements lamps in the future. Due to the very low usage, as the lamps and fixtures fail we recommend upgrading them to LEDs. The projects represent an opportunity for NHSA to modernize the lights within the pump stations, while reducing annual energy costs by roughly $40 and greenhouse gas emissions by 398 lbs CO_2e. The breakdown of existing and potential utility costs is illustrated in Figure 1 and Figure 2, respectively.

Figure 1 – Previous 12 Month Utility Costs

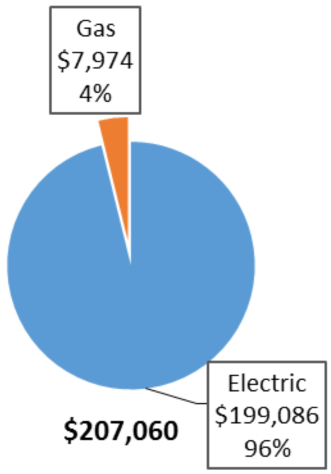
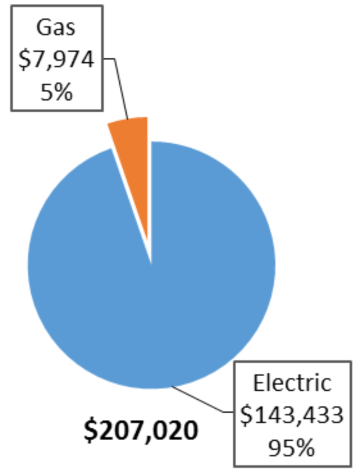


Figure 2 – Potential Post-Implementation Costs



A detailed description of the existing energy use of NHSA pumping stations can be found in Section 3.

The evaluated measures have been listed and grouped into major categories as shown in Figure 3. Brief descriptions of the categories can be found below and descriptions of the individual opportunities can be found in Section 4.

Figure 3 – Summary of Energy Reduction Opportunities

	Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**395**	**1.4**	**0.0**	**$39.47**	**$2,520.67**	**$250.00**	**$2,270.67**	**57.53**	**398**
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	331	1.1	0.0	$33.11	$2,213.00	$180.00	$2,033.00	61.41	334
ECM 2	Replace Incandescent Lamps with LEDs	Yes	64	0.2	0.0	$6.36	$307.67	$70.00	$237.67	37.35	64
TOTALS			**395**	**1.4**	**0.0**	**$39.47**	**$2,520.67**	**$250.00**	**$2,270.67**	**57.53**	**398**

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Lighting Upgrades generally involve the replacement of existing lighting components such as lamps and ballasts (or the entire fixture) with higher efficiency lighting components. These measure save energy by reducing the power used by the lighting components due to improved electrical efficiency.

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation sources at NHSA pumping stations. Based on the configuration of the sites, the available area, and their loads profiles there is a low potential for installing any PV and combined heat and power on-site generation measures.

For details on our evaluation and the self-generation potential, please refer to Section 5.

1.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, the equipment changes outlined for each ECM need to be selected and installed through project implementation. One of the first considerations is if there is capital available for project implementation. Another consideration is whether to pursue individual ECMs, a group of ECMs, or a comprehensive approach wherein all ECMs are pursued, potentially in conjunction with other facility projects or improvements.

Rebates, incentives, and financing are available from the NJBPU, NJCEP, as well as some of the state's investor-owned utilities, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any project, please review the appropriate incentive program guidelines before proceeding. This is important because in most cases you will need to submit an application for the incentives before purchasing materials and beginning installation.

For facilities with capital available for implementation of selected individual measures or phasing implementation of selected measures over multiple years, incentives are available through the SmartStart program. To participate in this program you may utilize internal resources, or an outside firm or contractor, to design the ECM(s), select the equipment and apply for the incentive(s). Program pre-approval is required for some SmartStart incentives, so only after receiving approval may the ECM(s) be installed. The incentive values listed above in Figure 3 represent the SmartStart program and will be explained further in Section 7, as well as the other programs as mentioned below.

For facilities without capital available to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with external project development, design, and implementation services as well as financing for implementing ECMs. This LGEA report is the first step for participating in ESIP and should help you determine next steps. Refer to Section 7.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a program (non-NJCEP) designed to reduce consumer electric load when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability locally. By enabling grid operators to call upon Curtailment Service Providers and energy consumers to reduce electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and participants will receive payments whether or not their facility is called upon to curtail their load. Refer to Section 6 for additional information on this program.

Additional descriptions of all relevant incentive programs are located in Section 7. You may also check the following website for further information on available rebates and incentives: www.njcleanenergy.com/ci.

To ensure projects are implemented such that maximum savings and incentives are achieved, bids and specifications should be reviewed by your procurement personnel and/or consultant(s) to ensure that selected equipment coincides with LGEA recommendations, as well as applicable incentive program guidelines and requirements.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 4 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Fred J. Pocci P.E.	Authority Engineer	fpocci@nhudsonsacom	201-963-4685
Don Conger P.E.	Project Director	Don.Conger@CH2M.com	(201) 795 1411 x244
TRC Energy Services			
Brian Dattellas	Assoc VP	BDattellas@trcsolutions.com	(516) 822-2045
Colman Snaith	Director Engineering	CSnaith@trcsolutions.com	(415) 434 2600

2.2 General Site Information

On May 10th, 2016, TRC performed energy audits of ten pumping stations located throughout the North Hudson Sewer Authority's service territory. TRC's team reviewed the facility operations and focus the investigation on the energy-using systems.

The pumping stations included in this study have a total enclosed area of 10,800 square foot. The facilities vary from small buildings with pumps and bar screens to underground vaults.

Building Name	SF
5th Street Pump Station	1,000
11th Street Pump Station	750
18th Street Pump Station	5,000
Baldwin Pump Station	450
Port Imperial Pump Station #1	400
Port Imperial Pump Station #2	400
Port Imperial Pump Station #3	400
49th Street Pump Station (Underground Vault)	400
Liberty Place Pump Station (Underground Vault)	500
H1 Pump Station	1,500
Total:	**10,800**

The pumping stations mostly consists of centrifugal pumps with vertically mounted motors and aging and inefficient lighting. Most of the pumps are controlled by VFDs. Very few of the enclosed areas are conditioned, though all have exhaust fans. The buildings were constructed in 1956.

2.3 Building Occupancy

The pumping stations are rarely occupied, with occupancy generally limited to routine maintenance and unplanned outages. The pumps however are continuously available to handle sewage and/or storm water. The typical schedule is presented in the table below.

Figure 5 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
5th Street Pump Station	Weekday	Continuously Available
5th Street Pump Station	Weekend	Continuously Available
11th Street Pump Station	Weekday	Continuously Available
11th Street Pump Station	Weekend	Continuously Available
18th Street Pump Station	Weekday	Continuously Available
18th Street Pump Station	Weekend	Continuously Available
Balswin Pumpi Station	Weekday	Continuously Available
Balswin Pumpi Station	Weekend	Continuously Available
Port Imperial Pump Station #1	Weekday	Continuously Available
Port Imperial Pump Station #1	Weekend	Continuously Available
Port Imperial Pump Station #2	Weekday	Continuously Available
Port Imperial Pump Station #2	Weekend	Continuously Available
Port Imperial Pump Station #3	Weekday	Continuously Available
Port Imperial Pump Station #3	Weekend	Continuously Available
49th Street Pump Station	Weekday	Continuously Available
49th Street Pump Station	Weekend	Continuously Available
Liberty Place Pump Station	Weekday	Continuously Available
Liberty Place Pump Station	Weekend	Continuously Available
H1 Pump Station	Weekday	Continuously Available
H1 Pump Station	Weekend	Continuously Available

2.4 On-site Generation

All of the NHSA pumping stations (except 49th street and Liberty) have emergency generators which are used during the loss of utility power. None of the facilities have any on-site electric generation capacity for normal use.

2.5 Pump Stations

Please refer to Appendix A: Equipment Inventory & Recommendations for an inventory of major energy consuming equipment.

5th Street Pump Station

The 5th Street Pump Station is located within a small single story brick building with a sublevel for the sanitation pumps. The facility has a small service yard that also contains some equipment.

Lighting at the facility is provided predominately by linear 40 Watt fluorescent T12 lamps with electronic ballasts. Most of the building spaces use 2-lamp, 4-foot long, surface mounted fixtures. Lighting control throughout the building is provided by manual switches.

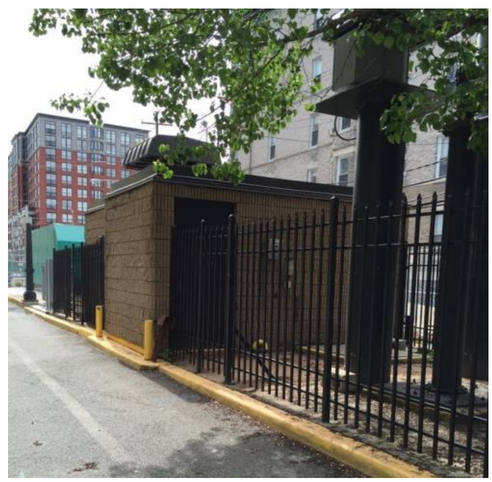
The building has minimal exterior lighting, which primarily consists of metal halide wall pack fixtures that are believed to be controlled with photocells.

The building is ventilated with exhaust fans. No heating or cooling was identified. A fan powered odor control unit helps mitigate any odor problems with the community.

The pumping system is comprised of three ABS submersible sewerage pumps that are control with VFDs. One of the pumps is the designated lead, while both of the remaining pumps operate in lag. The utility demand of the facility indicates that all three pumps are required to operate during periods of peak flow.

The facility is equipped with a 335 kW emergency generator.

11th Street Pump Station



The 11th Street Pump Station is located within a small single story brick building with a sublevel for the sanitation pumps. The facility has a small service yard that contains vent stacks and fans.

Lighting at the facility is provided predominately by linear fluorescent T12 lamps with electronic ballasts and compact fluorescent lamps. The building uses 4-foot long and 8-foot long, surface mounted fixtures. Lighting control throughout the building is provided by manual switches.

No exterior lighting was observed at the facility.

The electric control room is conditioned with a small roof top package unit and two small electric resistance unit heaters were observed in the sublevel. Two stacks with prop fans ventilate the valve room.

The pumping system is comprised of three open pit submersible sewerage pumps that are control with VFDs. One of the pumps is the designated lead while another pump operate in lag. The third pump remains in standby. The utility demand of the facility indicates that only two pumps are required to operate during periods of peak flow.

The facility is equipped with a 200 kW emergency generator.

18th Street Pump Station

The 18th Street Pump Station is located within a high bay concrete block building with a sublevel for the sanitation pumps. The facility has a service yard that contains its odor control unit.

Lighting at the facility is provided predominately by metal halide and mercury vapor high intensity discharge lamps. The facility also contains some old fluorescent T12 lamps with electronic ballasts. Lighting control throughout the building is provided by manual switches.

The building has minimal exterior lighting, which primarily consists of metal halide wall pack fixtures that are believed to be controlled with photocells.

The top level of the building is conditioned two natural gas fired unit heaters. The top level is also ventilated with two exhaust fans. A fan powered odor control unit helps mitigate any odor problems with the community.

The pumping system is comprised of three open pit submersible sewerage pumps that are controlled with VFDs and two large vertical turbine style combined sewerage (CSO) pumps that are also control with VFDs. During dry weather the facility pumps sanitary sewerage to the Adams Street WWTP via the open pit pumps. One of the pumps is the designated lead while another pump operate in lag. The third pump remains in standby. The utility demand of the facility indicates that only two pumps are required to operate during dry periods of high flow.

During wet weather the facility discharges combined sewerage into the Hudson River via the vertical turbine pumps rather than overflowing the Adams Street WWTP. Utility data indicates that the vertical turbine pumps did not operate during the 12 months prior to our site visit.

The facility is also equipped with a bar screen which are primarily used during wet weather. As the influent enters facility it passes through a mechanical bar screen where large, inorganic debris are extracted. The screen continually catches the inorganic debris. Once the debris builds up, the mechanical bar screen is elevated and the debris are then conveyed to a dumpster for removal to a local landfill.

The facility is equipped with a 750 kW emergency generator.

Baldwin Pump Station

The Baldwin Pump Station is located within a small single story brick building with a sublevel for the sanitation pumps.

Lighting at the facility is provided by two 60-Watt incandescent lamps. The lighting is control by a manual switch.

The building has no exterior lighting.

The building is ventilated with exhaust fans. No heating or cooling was identified.

The pumping system is comprised of two dry pit submersible sewerage pumps that are control with VFDs. One of the pumps is the designated lead, while the other pump operates in lag. The utility demand of the facility indicates that both pumps are required to operate during periods of peak flow.

The facility is equipped with a 80 kW emergency generator.

Port Imperial Pump Station #1

The Port Imperial Pump Station #1 is located within two underground vaults. A small single story brick building contains the electrical switch gear and emergency generator.

Lighting within the building is provided by 32-Watt linear fluorescent T8 lamps with electronic ballasts. The fixtures each contain two 4-foot long lamps. The fixtures are surface mounted. The lights are control by a manual switch.

The building has minimal exterior lighting, which primarily consists of a wall pack fixture that is believed to be controlled with photocells.

The building is ventilated with a small exhaust fan. No heating or cooling was identified in the building. Both the wet well and the valve vault have exhaust fans.

The pumping system is comprised of three submersible sewerage pumps that are control with VFDs. One of the pumps is the designated lead, while the other pumps operates in lag. The utility demand of the facility indicates that all pumps are required to operate during periods of peak flow.

The facility is also equipped with a Muffin Monster which is used during all pumping operation. Prior to entering a pump, influent passes through the Muffin Monster which grinds any large objects to protect the pumps from solids.

The facility is equipped with a 100 kW emergency generator.

Port Imperial Pump Station #2

The Port Imperial Pump Station #2 is located within two underground vaults. A small single story brick building contains the electrical switch gear and emergency generator.

Lighting within the building is provided by 32-Watt linear fluorescent T8 lamps with electronic ballasts. The fixtures each contain two 4-foot long lamps. The fixtures are surface mounted. The lights are control by a manual switch.

The building has minimal exterior lighting, which primarily consists of a wall pack fixture that is believed to be controlled with photocells.

The building is ventilated with a small exhaust fan. No heating or cooling was identified in the building. Both the wet well and the valve vault have exhaust fans.

The pumping system is comprised of three submersible sewerage pumps that are control with VFDs. One of the pumps is the designated lead, while the other pumps operates in lag. The utility demand of the facility indicates that all pumps are required to operate during periods of peak flow.

The facility is also equipped with a Muffin Monster which is used during all pumping operation. Prior to entering a pump, influent passes through the Muffin Monster which grinds any large objects to protect the pumps from solids.

The facility is equipped with a 250 kW emergency generator.

Port Imperial Pump Station #3

The Port Imperial Pump Station #3 is located within two underground vaults. A small single story brick building contains the electrical switch gear and emergency generator.

Lighting within the building is provided by 32-Watt linear fluorescent T8 lamps with electronic ballasts. The fixtures each contain two 4-foot long lamps. The fixtures are surface mounted. The lights are control by a manual switch.

The building has minimal exterior lighting, which primarily consists of a wall pack fixture that is believed to be controlled with photocells.

The building is ventilated with a small exhaust fan. No heating or cooling was identified in the building. Both the wet well and the valve vault have exhaust fans.

The pumping system is comprised of three submersible sewerage pumps that are control with VFDs. One of the pumps is the designated lead, while the other pumps operates in lag. The utility demand of the facility indicates that all pumps are required to operate during periods of peak flow.

The facility is also equipped with a Muffin Monster which is used during all pumping operation. Prior to entering a pump, influent passes through the Muffin Monster which grinds any large objects to protect the pumps from solids.

The facility is equipped with a 255 kW emergency generator.

49th Street Pump Station

The 49th Street Pump Station is located in an underground vault within an above ground electrical/control panel. There are no building or lighting systems associated with this facility.

The pumping system is comprised of two submersible sewerage pumps that are control with VFDs. One of the pumps is the designated lead, while the remaining pump operates in lag. The utility demand of the facility indicates only a single pumps is required to operate during periods of peak flow.

Liberty Pump Station

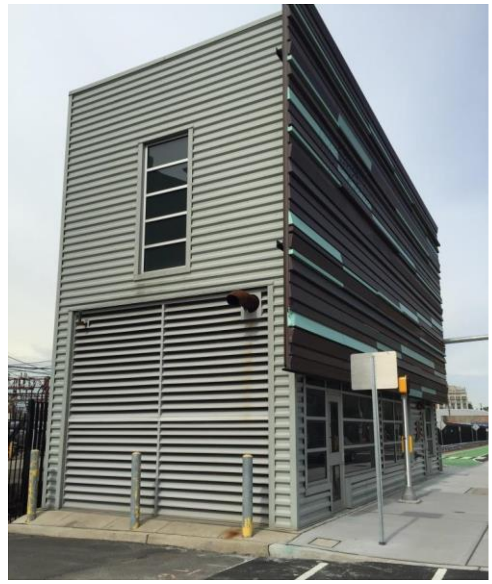
The Liberty Pump Station is located in an underground vault within an above ground electrical/control panel. There are no building or lighting systems associated with this facility.

The pumping system is comprised of two submersible sewerage pumps that are control with VFDs. One of the pumps is the designated lead, while the remaining pump operates in lag. The utility demand of the facility indicates only a single pumps is required to operate during periods of peak flow.

H1 Pump Station

The H1Pump Station is located within a two story concrete block building with an underground vault for the sanitation pumps.

Lighting within the building is provided by 28-Watt linear fluorescent T5 lamps with electronic ballasts. The fixtures each contain two 4-foot long lamps. The fixtures are surface mounted. The lights are control by a manual switch.



The building has minimal exterior lighting, which primarily consists of metal halide wall pack fixtures that are believed to be controlled with photocells.

The building is conditioned with three split system heat pumps natural air source gas fired unit heaters.

The pumping system is comprised of two large vertical turbine style wet weather pumps that are control with VFDs. . One of the pumps is the designated lead, while the remaining pump operates in lag. The pumps operate to maintain level control of the wet well. During the site inspection both pumps were off.

Utility data for the site was not available so pump operation could not be determined.

The facility is also equipped with two bar screens which, along with the pumps, are primarily used during wet weather. As the influent enters facility it passes through mechanical bar screens where large, inorganic debris are extracted. The screens continually catch the inorganic debris. Once the debris builds up, a mechanical bar screen is elevated and the debris is then conveyed to a dumpster for removal to a local landfill.

The facility is equipped with a 750 kW emergency generator.

3 SITE ENERGY USE AND COSTS

Utility data for electricity and natural gas was analyzed to identify opportunities for savings. The electricity usage is based on sewer and storm water flow in the catchment area. Natural gas usage is dominated by heating loads. There are a number of factors that cause the energy use of these facilities to vary from other facilities identified as: Wastewater Pumping. Specific local climate conditions, variations in effluent flow, and the types of systems used to process the effluent.

3.1 Pumping Stations' Total Cost of Energy

The following energy consumption and cost data summaries the usage from all pumping stations. This is based on the last 12-month period of utility usage data that was provided for each utility. The annual consumption and cost was developed from this information.

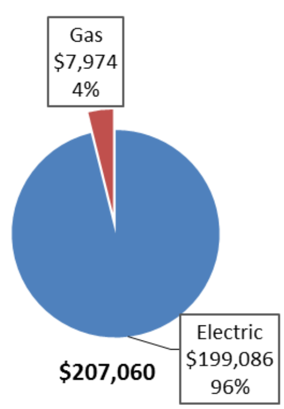
Figure 6 - Utility Summary

Building Name	kWh/yr	kW	Therms/yr
5th Street Pump Station	494,969	165	0
11th Street Pump Station	129,880	109	283
18th Street Pump Station	233,399	124	9,451
Baldwin Pump Station	78,440	30	11
Port Imperial Pump Station #1	84,079	23	0
Port Imperial Pump Station #2	99,840	72	0
Port Imperial Pump Station #3	234,720	71	0
49th Street Pump Station (Underground Vault)	4,536	5	0
Liberty Place Pump Station (Underground	11,118	6	0
H1 Pump Station	0	0	0
Total:	**1,370,981**	**604**	**9,744**

Utility Summary for NHSA Pumping Stations		
Fuel	**Usage**	**Cost**
Electricity	1,370,981 kWh	$199,086
Natural Gas	9,744 Therms	$7,974
Total		**$207,060**

The current utility cost to operate all pumping stations is $207,060 as shown in the chart below.

Figure 7 - Energy Cost Breakdown



3.2 Pumping Stations' Total Electricity Usage

Electricity is provided by PSE&G. The average electric cost (combined for commodity, transmission and distribution) for the past 12 months is $0.100/kWh, which is the blended rate used throughout the analyses in this report. Demand charges represent over 30% of the total cost of electricity. The total monthly electricity consumption and peak demand for all pumping stations is represented graphically in the chart below. Energy and demand for the pumping stations follow the weather (precipitation).

Figure 8 - Electric Usage & Demand

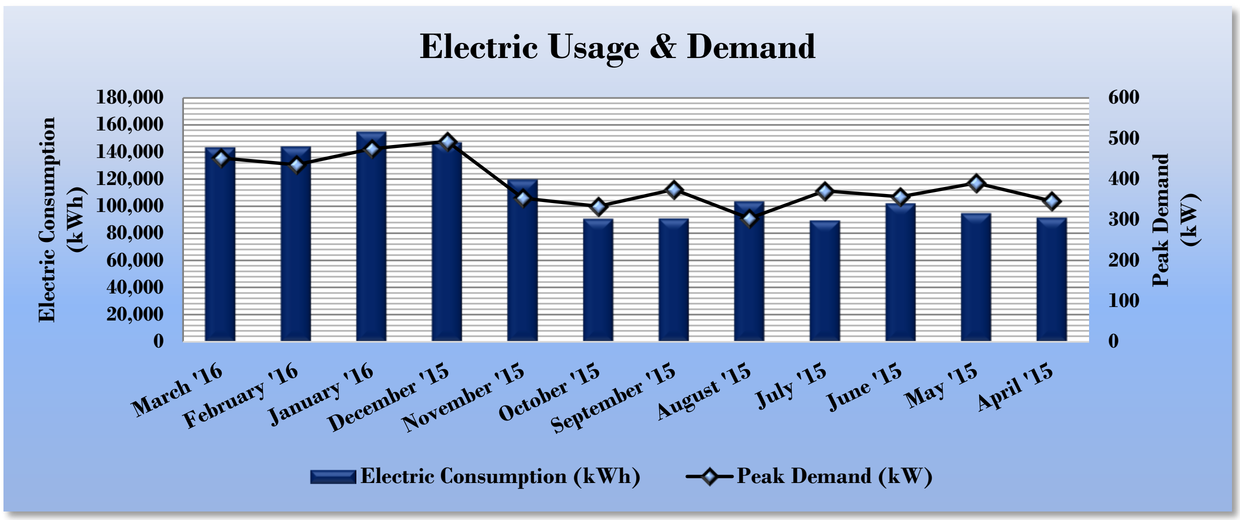
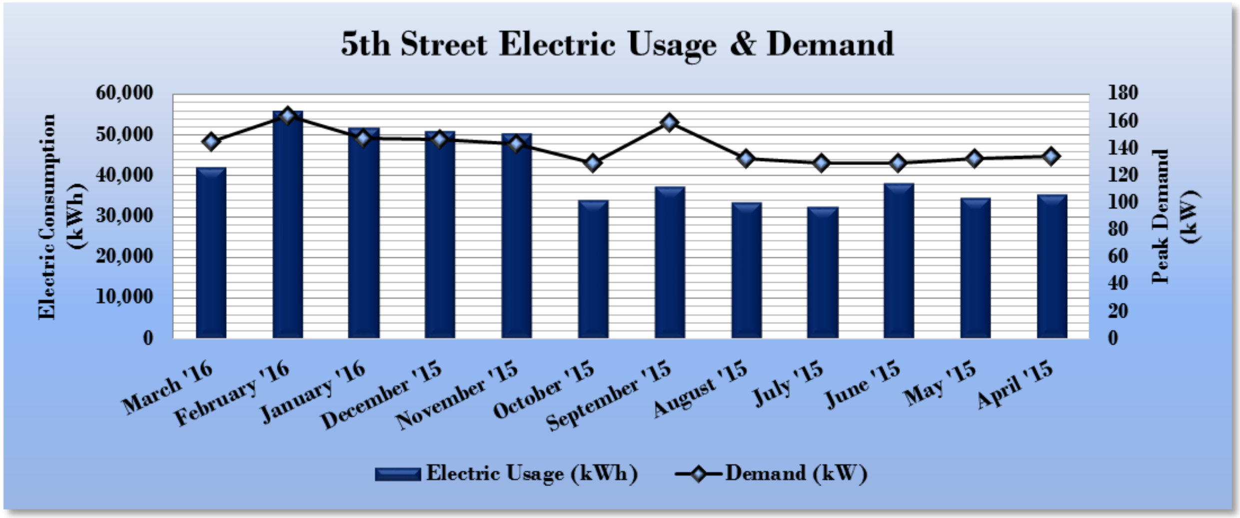


Figure 9 - Electric Usage & Demand

Electric Billing Data for NHSA Pumping Stations					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
4/13/16	30	143,202	452	$5,892	$17,017
3/14/16	31	143,891	435	$5,647	$21,455
2/12/16	30	154,908	475	$6,025	$18,127
1/13/16	32	146,916	493	$6,923	$18,694
12/12/15	32	119,614	353	$4,709	$15,149
11/10/15	28	90,574	333	$4,258	$12,689
10/13/15	30	90,869	374	$5,100	$13,649
9/13/15	32	103,402	303	$3,907	$16,313
8/12/15	29	89,348	371	$5,053	$17,059
7/15/15	31	102,100	357	$4,755	$17,694
6/13/15	30	94,681	391	$5,278	$17,611
5/14/15	30	91,476	346	$4,585	$13,628
Totals	**365**	**1,370,981**	**492.7**	**$62,133**	**$199,086**
Annual	**365**	**1,370,981**	**492.7**	**$62,133**	**$199,086**

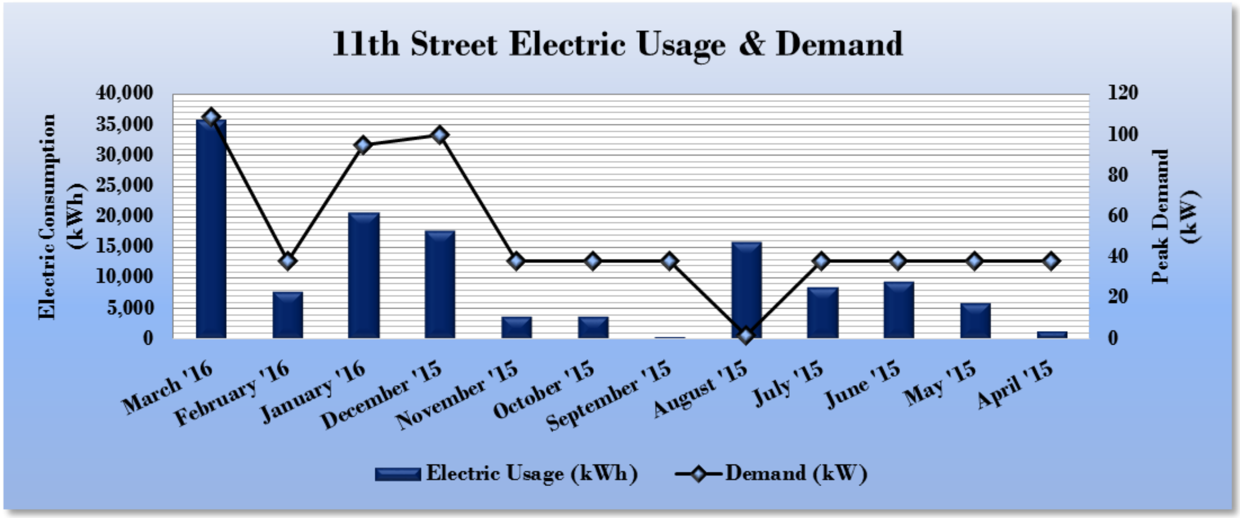
3.3 Pumping Stations

5th Street Pump Station



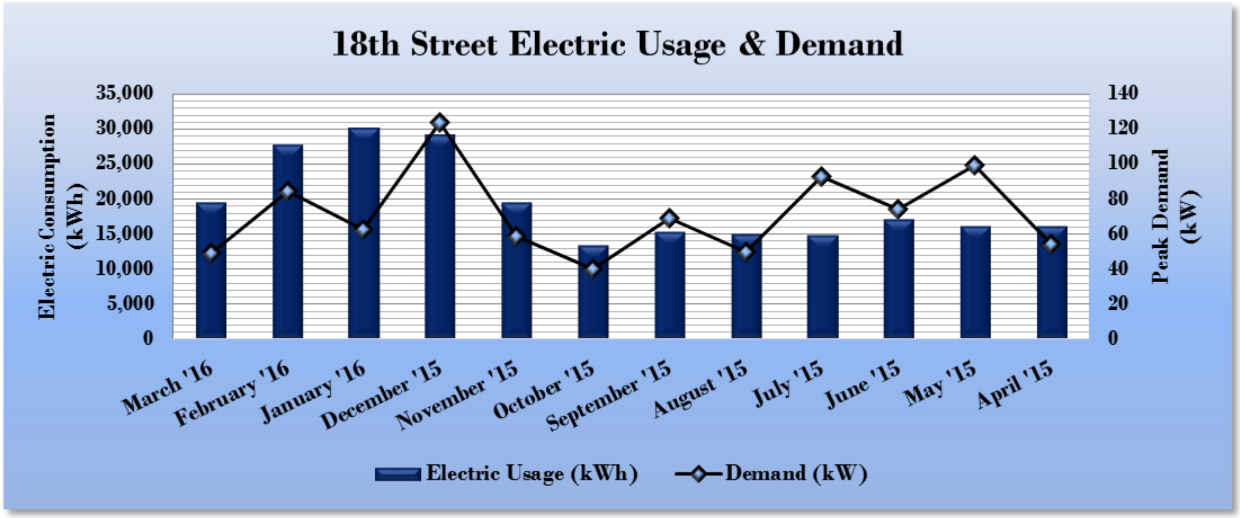
Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/13/16	30	41,940	145	$2,338	$5,469	No
3/14/16	32	55,754	165	$2,649	$6,840	No
2/11/16	29	51,552	148	$2,373	$6,209	No
1/13/16	33	50,636	147	$2,360	$6,228	No
12/11/15	31	50,206	144	$2,310	$6,438	No
11/10/15	29	34,060	129	$2,079	$5,074	No
10/12/15	31	37,268	159	$2,554	$5,820	No
9/11/15	30	33,435	133	$2,127	$6,247	No
8/12/15	29	32,172	129	$2,073	$6,124	No
7/14/15	32	38,054	130	$2,079	$6,679	No
6/12/15	30	34,554	133	$2,126	$6,464	No
5/13/15	29	35,338	135	$2,162	$5,452	No
Totals	**365**	**494,969**	**164.7**	**$27,230**	**$73,044**	0

11th Street Pump Station



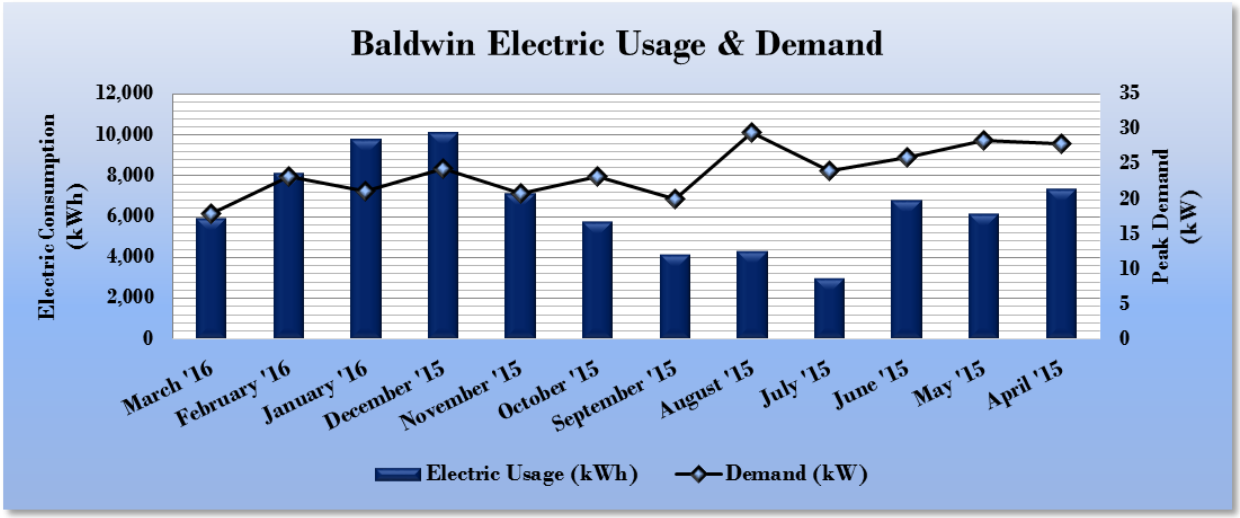
Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/13/16	30	35,600	109	$1,833	$4,308	No
3/14/16	32	7,760	38	$646	$2,268	No
2/11/16	29	20,560	95	$1,600	$3,060	No
1/13/16	33	17,640	100	$1,680	$2,964	No
12/11/15	31	3,560	38	$645	$927	No
11/10/15	29	3,640	38	$645	$943	No
10/12/15	28	360	38	$645	$679	No
9/14/15	33	15,880	2	$34	$1,456	No
8/12/15	29	8,520	38	$644	$1,729	No
7/14/15	32	9,280	38	$644	$1,812	No
6/12/15	30	5,880	38	$644	$1,503	No
5/13/15	29	1,200	38	$644	$752	No
Totals	365	129,880	108.8	$10,304	$22,401	0

18th Street Pump Station



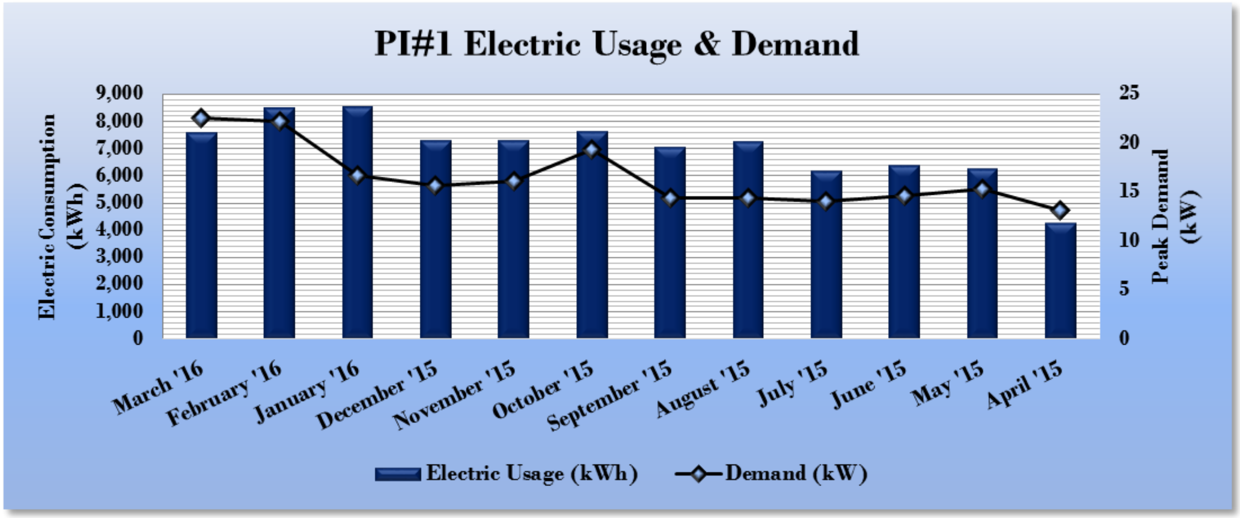
Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/13/16	30	19,391	49	$794	$2,442	No
3/14/16	32	27,685	85	$1,364	$6,062	No
2/11/16	29	30,031	63	$1,006	$3,397	No
1/13/16	33	29,200	124	$1,992	$4,380	No
12/11/15	31	19,541	59	$946	$2,754	No
11/10/15	29	13,420	40	$643	$2,048	No
10/12/15	31	15,272	69	$1,113	$2,671	No
9/11/15	30	14,921	50	$798	$2,620	No
8/12/15	29	14,860	93	$1,492	$3,855	No
7/14/15	32	17,073	74	$1,187	$3,389	No
6/12/15	30	16,002	99	$1,595	$3,625	No
5/13/15	29	16,003	54	$870	$2,567	No
Totals	**365**	**233,399**	**124**	**$13,800**	**$39,810**	0

Baldwin Pump Station



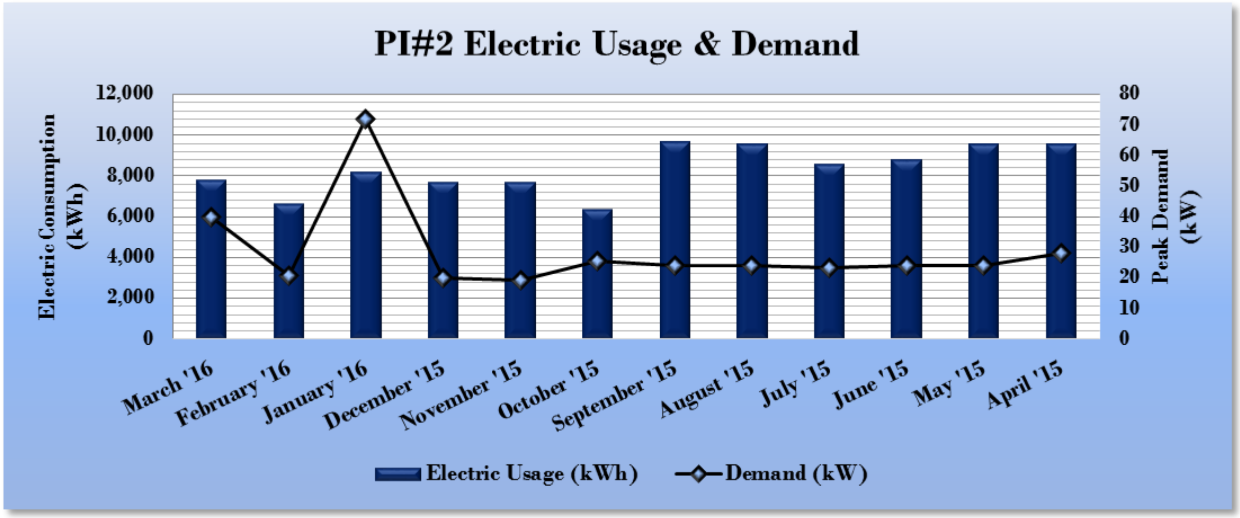
Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/13/16	30	5,880	18	$303	$716	No
3/14/16	32	8,120	23	$390	$1,846	No
2/11/16	29	9,760	21	$356	$1,052	No
1/13/16	33	10,120	24	$410	$1,150	No
12/11/15	31	7,120	21	$349	$909	No
11/10/15	28	5,760	23	$390	$858	No
10/13/15	29	4,120	20	$336	$675	No
9/14/15	33	4,280	30	$497	$1,118	No
8/12/15	27	3,000	24	$403	$871	No
7/16/15	34	6,800	26	$436	$1,276	No
6/12/15	28	6,120	28	$477	$1,276	No
5/15/15	31	7,360	28	$470	$1,110	No
Totals	**365**	**78,440**	**29.6**	**$4,817**	**$12,857**	0

Port Imperial Pump Station #1



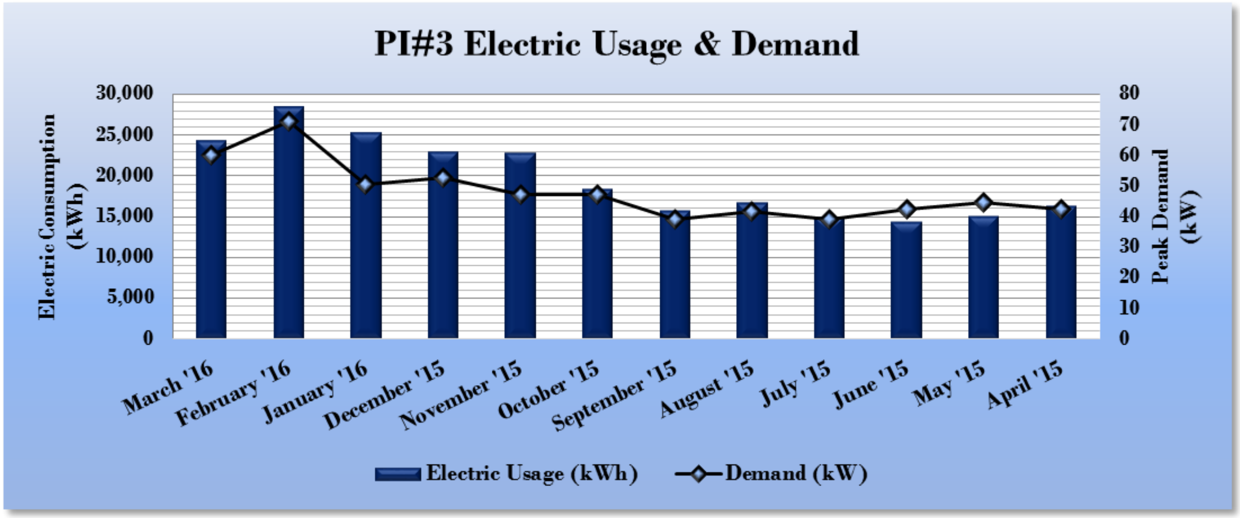
Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/15/16	30	7,585	23	$100	$717	No
3/16/16	29	8,474	22	$98	$787	No
2/16/16	32	8,511	17	$73	$775	No
1/15/16	31	7,267	16	$68	$683	No
12/15/15	33	7,299	16	$70	$722	No
11/12/15	27	7,629	19	$85	$791	No
10/16/15	31	7,040	14	$63	$719	No
9/15/15	32	7,226	14	$63	$904	No
8/14/15	29	6,177	14	$61	$807	No
7/16/15	30	6,375	15	$64	$846	No
6/16/15	32	6,250	15	$66	$844	No
5/15/15	29	4,246	13	$57	$477	No
Totals	**365**	**84,079**	**22.6**	**$867**	**$9,072**	0

Port Imperial Pump Station #2



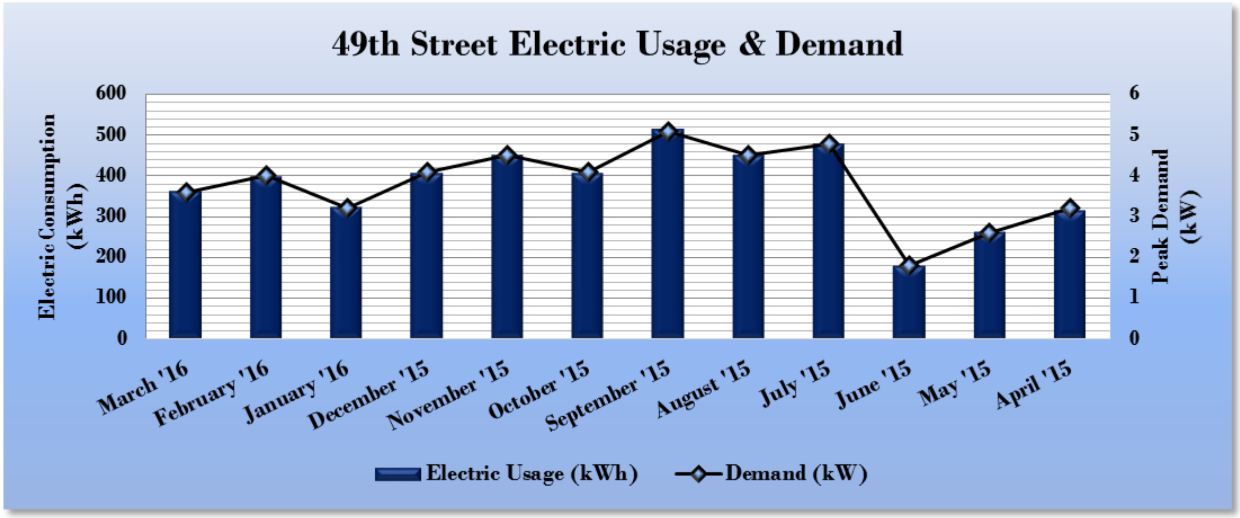
Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/15/16	30	7,760	40	$175	$930	No
3/16/16	29	6,640	21	$91	$737	No
2/16/16	32	8,160	72	$314	$1,116	No
1/15/16	31	7,680	20	$87	$857	No
12/15/15	33	7,680	19	$84	$890	No
11/12/15	27	6,320	26	$112	$797	No
10/16/15	31	9,680	24	$105	$1,157	No
9/15/15	32	9,520	24	$105	$1,402	No
8/14/15	29	8,560	23	$101	$1,297	No
7/16/15	30	8,800	24	$105	$1,351	No
6/16/15	32	9,520	24	$105	$1,442	No
5/15/15	29	9,520	28	$122	$1,207	No
Totals	**365**	**99,840**	**72**	**$1,506**	**$13,183**	0

Port Imperial Pump Station #3



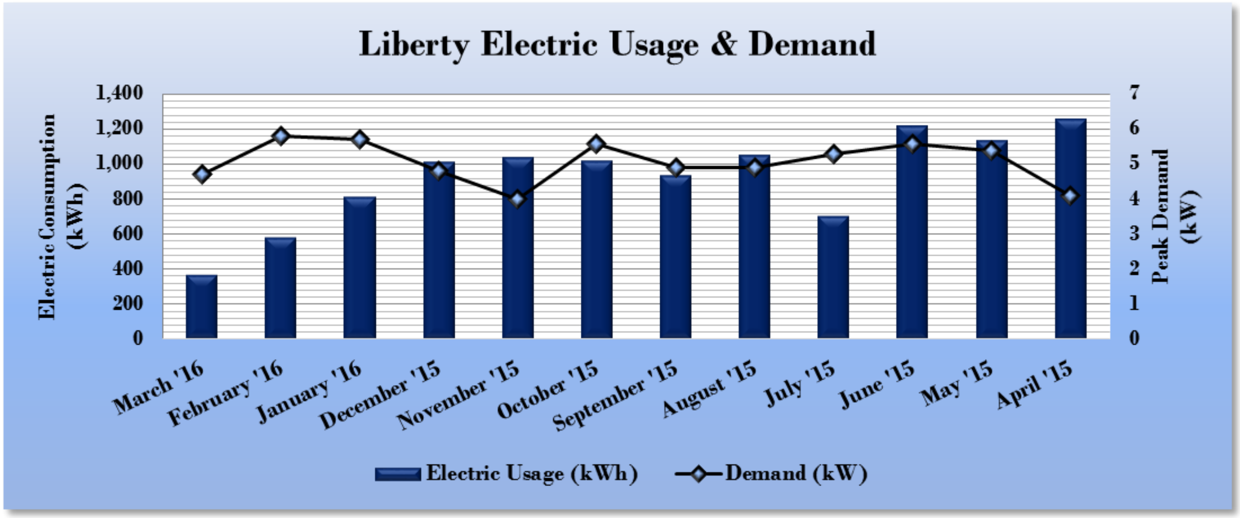
Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/15/16	30	24,320	60	$264	$2,219	No
3/16/16	29	28,480	71	$312	$2,600	No
2/16/16	32	25,200	50	$220	$2,273	No
1/15/16	31	22,960	53	$230	$2,148	No
12/15/15	33	22,720	47	$206	$2,211	No
11/12/15	27	18,320	47	$206	$1,884	No
10/16/15	31	15,680	39	$171	$1,617	No
9/15/15	32	16,640	42	$181	$2,169	No
8/14/15	29	14,880	39	$170	$1,993	No
7/16/15	30	14,320	42	$184	$2,003	No
6/16/15	32	14,960	45	$194	$2,106	No
5/15/15	29	16,240	42	$184	$1,767	No
Totals	**365**	**234,720**	**71.2**	**$2,523**	**$24,990**	0

49th Street Pump Station



Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/6/16	30	360	4	$65	$94	No
3/7/16	32	396	4	$72	$172	No
2/4/16	27	324	3	$58	$85	No
1/8/16	32	405	4	$74	$108	No
12/7/15	34	450	5	$81	$121	No
11/3/15	28	405	4	$74	$111	No
10/6/15	32	513	5	$92	$138	No
9/4/15	28	450	5	$81	$161	No
8/7/15	31	477	5	$86	$173	No
7/7/15	29	180	2	$32	$68	No
6/8/15	33	261	3	$47	$96	No
5/6/15	28	315	3	$58	$89	No
Totals	364	4,536	5.1	$820	$1,416	0

Liberty Pump Station



Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/15/16	30	366	5	$21	$122	No
3/16/16	29	582	6	$25	$143	No
2/16/16	32	810	6	$25	$160	No
1/15/16	31	1,008	5	$21	$176	No
12/15/15	32	1,038	4	$17	$177	No
11/13/15	30	1,020	6	$24	$183	No
10/14/15	29	936	5	$21	$173	No
9/15/15	32	1,050	5	$21	$236	No
8/14/15	29	702	5	$23	$210	No
7/16/15	30	1,218	6	$24	$270	No
6/16/15	29	1,134	5	$23	$255	No
5/18/15	32	1,254	4	$18	$207	No
Totals	365	11,118	5.8	$265	$2,313	0

H1 Pump Station

No utility data was provided for H1 pumping station. The building systems and equipment associated with this facility were not included in the energy balance.

3.4 Pumping Stations' Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for all of the pumping stations for the past 12 months is $0.818/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption for all of the pumping station is represented graphically in the chart below.

Figure 10 - Natural Gas Usage

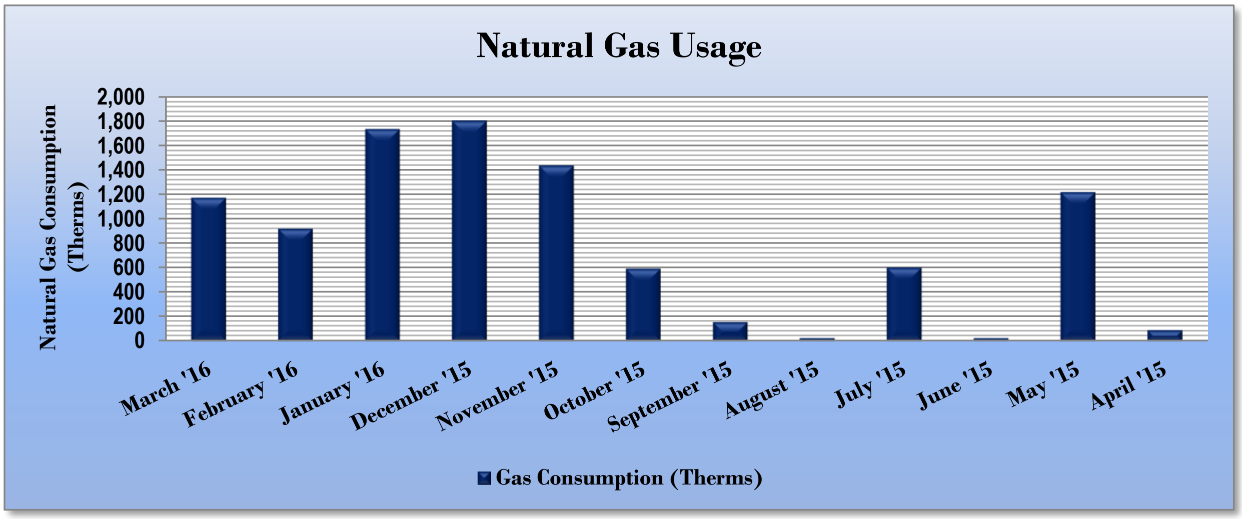
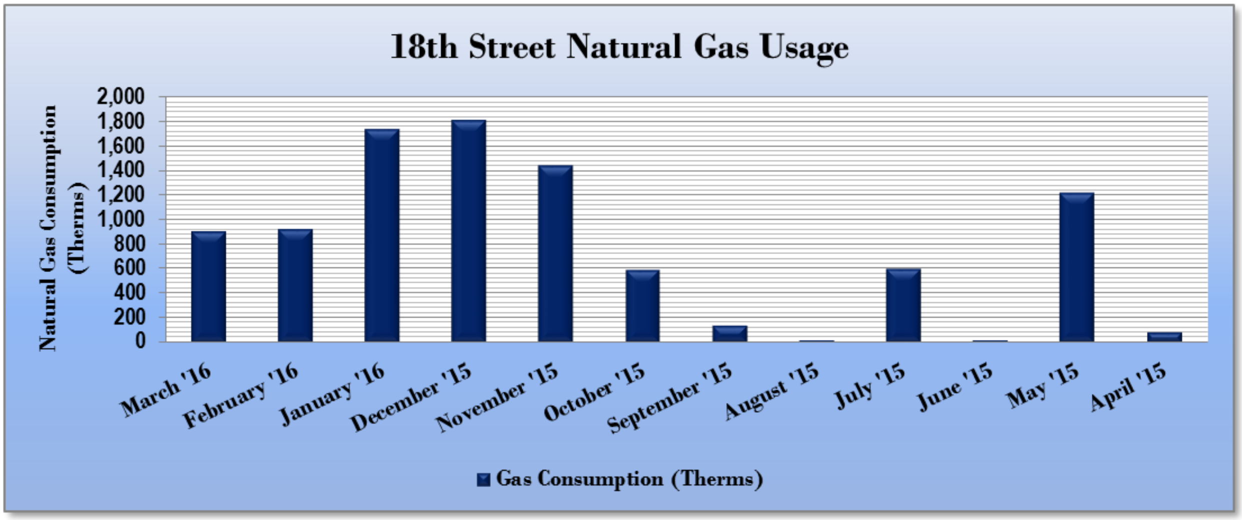


Figure 11 - Natural Gas Usage

Gas Billing Data for NHSA Pumping Stations			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
4/13/16	30	1,170	$865
3/14/16	32	918	$721
2/11/16	29	1,731	$1,419
1/13/16	33	1,801	$1,497
12/11/15	31	1,435	$1,164
11/10/15	28	591	$481
10/13/15	30	153	$151
9/13/15	32	22	$51
8/12/15	28	599	$503
7/15/15	33	22	$51
6/12/15	29	1,216	$970
5/14/15	30	87	$100
Totals	**365**	**9,744**	**$7,974**
Annual	**365**	**9,744**	**$7,974**

18th Street Pump Station

The 18th street pump station accounts for over 95% of the gas used by all of the pumping stations. The gas at 18th street is used for space heating.



Electric Billing Data for NHSA Pumping Stations						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
4/13/16	30	19,391	49	$794	$2,442	No
3/14/16	32	27,685	85	$1,364	$6,062	No
2/11/16	29	30,031	63	$1,006	$3,397	No
1/13/16	33	29,200	124	$1,992	$4,380	No
12/11/15	31	19,541	59	$946	$2,754	No
11/10/15	29	13,420	40	$643	$2,048	No
10/12/15	31	15,272	69	$1,113	$2,671	No
9/11/15	30	14,921	50	$798	$2,620	No
8/12/15	29	14,860	93	$1,492	$3,855	No
7/14/15	32	17,073	74	$1,187	$3,389	No
6/12/15	30	16,002	99	$1,595	$3,625	No
5/13/15	29	16,003	54	$870	$2,567	No
Totals	**365**	**233,399**	**124**	**$13,800**	**$39,810**	0
Annual	**365**	**233,399**	**124**	**$13,800**	**$39,810**	

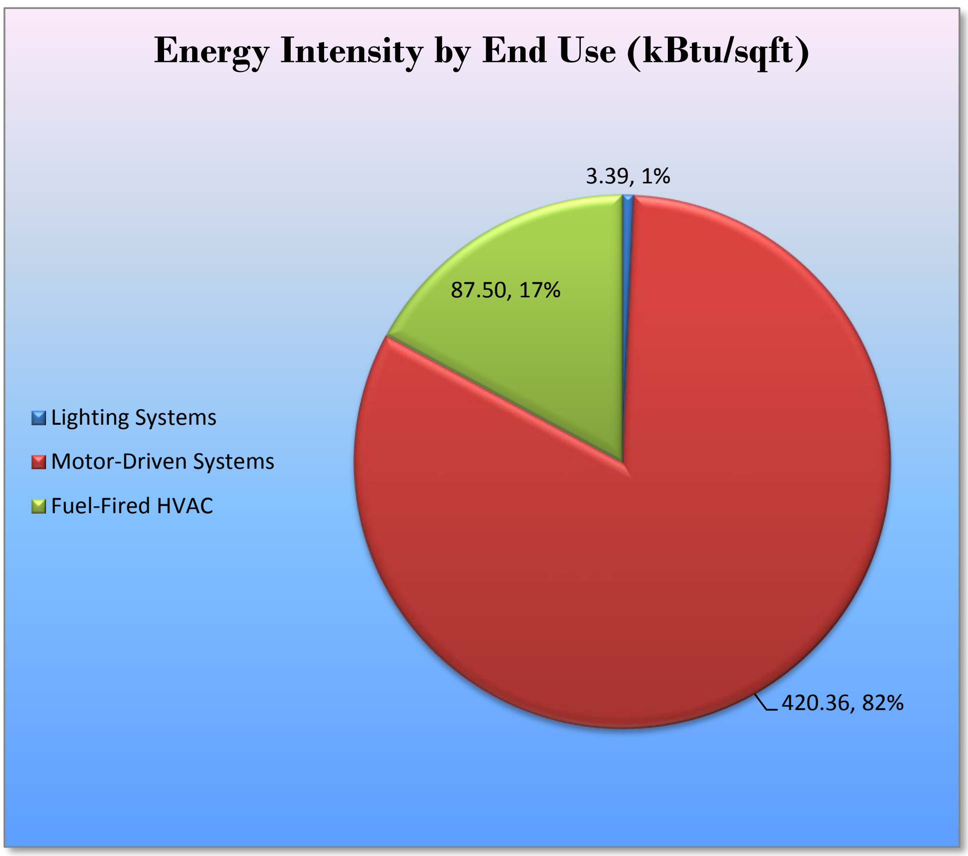
3.5 Benchmarking

The electricity usage for each pumping station is based on sewer and storm water flow in the catchment area. There are a number of factors that cause the energy use of these facilities to vary from other Wastewater Pumping facilities. Factors include: the specific size of the catchment area, inclusion of storm water, market sectors served, and the types of systems used to process the effluent. A meaning full benchmark could not be developed as part of this study.

3.6 Energy End-Use Breakdown

In order to provide a complete overview of energy consumption across building systems, an energy balance was performed for individual facilities. An energy balance utilizes standard practice engineering methods to evaluate all components of the various electric and fuel-fired systems found in a building and determine their proportional contribution to overall building energy usage. This visual representation of energy end uses highlights systems that may benefit most from energy efficiency projects.

Figure 12 - Energy Balance (% and kBtu/SF)



4 Energy Conservation Measures

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the NHSA Pumping Stations regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016, approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances. A higher level of investigation may be necessary to support any custom SmartStart or Pay for Performance, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 7.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

TRC Energy Services evaluated upgrading the lighting in the pump stations. The T12 florescent technology used in most locations is very old and it will become difficult to find replacements lamps in the future. Due to the very low usage of the lights, it is difficult to justify the project on energy savings alone. As the lamps and fixtures fail we recommend upgrading them to LEDs. The projects represent an opportunity for NHSA to modernize the lights within the pump stations, while reducing annual energy costs and greenhouse gas emissions.

4.1.1 Lighting Upgrades

Our recommendations for lighting upgrades are summarized in Figure 13 below.

Figure 13 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**395**	**1.4**	**0.0**	**$39.47**	**$2,520.67**	**$250.00**	**$2,270.67**	**57.53**	**398**
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	331	1.1	0.0	$33.11	$2,213.00	$180.00	$2,033.00	61.41	334
ECM 2	Retrofit Fixtures with LED Lamps	64	0.2	0.0	$6.36	$307.67	$70.00	$237.67	37.35	64

ECM 1: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	331	1.1	0.0	$33.11	$2,213.00	$180.00	$2,033.00	61.41	334
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	0

Measure Description

This measure evaluates replacing linear fluorescent lamps, ballasts, and reflectors with LED tube lamps, reflectors, and drivers specifically designed for existing linear fluorescent fixtures. The retrofit uses the existing fixture housing but replaces the rest of the components with an efficient source and reflectors designed for LEDs. This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output and efficiently projects the light into the space.

Maintenance savings are anticipated since LED sources have burn hours which are more than twice that of a fluorescent source. Maintenance savings may be partially offset by the higher material costs associated with LED sources.

During retrofit planning and design, we recommend a holistic approach that considers both the technology of the lighting sources and how they are controlled.

ECM 2: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	64	0.2	0.0	$6.36	$307.67	$70.00	$237.67	37.35	64
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	0

Measure Description

This measure evaluates replacing incandescent and halogen screw-in/plug-in based lamps with LED lamps. Screw-in/plug-in LED lamps can be used as a direct replacement for most other screw-in/plug-in lamps. This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output.

Maintenance savings are anticipated since LED sources have burn hours which are more than twice that of a fluorescent source and more than 10 times incandescent sources. Maintenance savings may be partially offset by the higher material costs associated with LED sources.

During retrofit planning and design, we recommend a holistic approach that considers both the technology of the lighting sources and how they are controlled.

5 On-Site Generation Measures

On-site generation measure options include both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) on-site technologies that generate power to meet all or a portion of the electric energy needs of a facility, often repurposing any waste heat where applicable. Also referred to as distributed generation, these systems contribute to Greenhouse Gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, resulting in the electric system reliability through improved transmission and distribution system utilization.

The State of New Jersey's Energy Master Plan (EMP) encourages new distributed generation of all forms and specifically focuses on expanding use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines a goal of 70% of the State's electrical needs to be met by renewable sources by 2050.

Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before making a decision to implement, a feasibility study should be conducted that would take a detailed look at existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

5.1 Photovoltaic

Sunlight can be converted into electricity using photovoltaics (PV) modules. Modules are racked together into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility's electrical distribution system. The amount of unobstructed area available determines how large of a solar array can be installed. The size of the array combined with the orientation, tilt, and shading elements determines the energy produced.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has a **Low** potential for installing a PV array.

In order to be cost-effective, a solar PV array generally needs a minimum of 4,000 square feet of flat or south-facing rooftop, or other unshaded space, on which to place the PV panels. In our opinion, the facilities do not meet these minimum criteria for cost-effective PV installation.

5.2 Combined Heat and Power

In non-industrial settings, combined heat and power (CHP) is the on-site generation of electricity and recovery of heat which is put to beneficial use. Common prime movers in CHP applications include reciprocating engines, microturbines, fuel cells, and (at large facilities) gas turbines. Electricity is typically interconnected to the sites local distribution system. Heat is recovered from the exhaust stream and the ancillary cooling system and interconnected to the existing hot water (or steam) distribution system.

CHP systems are typically used to produce a portion of the electricity needed by a facility, with the balance of electric needs satisfied by purchase from the grid. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for the purpose of space cooling. The key criteria used for screening, however, is the amount of time the system operates at full load and the facility's ability to use the recovered heat. Facilities with continuous use for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has a **Low** potential for installing a cost-effective CHP system.

Lack of gas service, non-existent or infrequent thermal load, and lack of space near the existing thermal generation are the most significant factors contributing to the low potential for CHP at the site. In our opinion, the facility do not meet the minimum requirements for a cost-effective CHP installation.

6 DEMAND RESPONSE

Demand Response (DR) is a program designed to reduce consumer electric load when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. DR service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability locally.

By enabling grid operators to call upon Curtailment Service Providers and energy consumers to reduce electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and participants will receive payments whether or not their facility is called upon to curtail their load.

Typically an electric customer needs to be capable of reducing their electric demand, within minutes, by at least 100 kW or more in order to participate in a DR program. Customers with a greater capability to quickly curtail their demand during peak hours will receive higher payments. Customers with back-up generators onsite may also receive additional DR payments for their generating capacity if they agree to run the generators for grid support when called upon. Eligible customers who have chosen to participate in a DR program often find it to be a valuable source of revenue for their facility(ies) because the payments can significantly offset annual utility costs.

Participating customers can often quickly reduce their peak load through simple measures, such as temporarily raising temperature set points on thermostats so that air conditioning units run less frequently or agreeing to dim or shut off less critical lighting. This usually requires some level of building automation and controls capability to ensure rapid load reduction during a DR event cycle. DR program participants often have to install smart meters and may need to also sub-meter larger energy-using equipment, such as chillers, in order to demonstrate compliance with DR program requirements.

DR does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a demand response activity in most situations.

The first step toward participation in a DR program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (http://www.pjm.com/markets-and-operations/demand-response/csps.aspx). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (http://www.pjm.com/training/training%20material.aspx), along with a variety of other DR program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding the program rules and requirements for metering and controls, a facility's ability to temporarily reduce electric load, as well as the payments involved in participating in the program. Also, these providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment to help ensure compliance of all terms and conditions of a DR contract.

7 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section.

7.1 SmartStart

Overview

The SmartStart program offers incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives from year to year for various energy efficiency equipment based on market trends and new technologies.

Prescriptive Equipment Incentives Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

Most equipment sizes and types are served by this program. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades.

The SmartStart prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SmartStart program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentive offerings for specific devices.

Since your facility is an existing building, only the retrofit incentives have been applied in this report. Custom measure incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings, capped at 50% of the total installed incremental project cost, or a project cost buy down to a one year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

To participate in the SmartStart program you will need to submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. Applicants may work with a contractor of their choosing and can also utilize internal personnel, which provides added flexibility to the program. Using internal personnel also helps improve the economics of the ECM by reducing the labor cost that is included in the tables in this report.

Detailed program descriptions, instructions for applying and applications can be found at: www.njcleanenergy.com/SSB.

7.2 Direct Install

Overview

Direct Install is a turnkey program available to existing small to mid-sized facilities with a peak electric demand that did not exceed 200 kW in any of the preceding 12 months. You will work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and install those measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Direct Install participants will also be held to a fiscal year cap of $250,000 per entity.

How to Participate

To participate in the Direct Install program you will need to contact the participating contractor assigned to the county where your facility is located; a complete list is provided on the Direct Install website identified below. The contractor will be paid the program incentive directly which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps mentioned above, and the remaining 30% of the cost is your responsibility to the contractor.

Since Direct Install offers a free assessment, LGEA applicants that do not meet the audit program eligibility requirements, but do meet the Direct Install requirements, may be moved directly into this program.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

7.3 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) is an alternate method for New Jersey's government agencies to finance the implementation of energy conservation measures. An ESIP is a type of "performance contract," whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. This is done in a manner that ensures that annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive in year one, and every year thereafter. ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs can be leveraged to help further reduce the total project cost of eligible measures.

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an Energy Services Company or "ESCO."
(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.
(3) Use a hybrid approach of the two options described above where the ESCO is utilized for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the Energy Savings Plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Entities should carefully consider all alternatives to develop an approach that best meets their needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

Please note that ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you may utilize the incentive programs to help further reduce costs when compiling the ESP. You should refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.4 Demand Response Energy Aggregator

The first step toward participation in a Demand Response (DR) program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (http://www.pjm.com/markets-and-operations/demand-response/csps.aspx). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (http://www.pjm.com/training/training%20material.aspx), along with a variety of other program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding the program rules and requirements for metering and controls, a facility's ability to temporarily reduce electric load, as well as the payments involved in participating in the program. Also, these providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment to help ensure compliance of all terms and conditions of a DR contract.

See Section 6 for additional information.

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

In 1999, New Jersey State Legislature passed the Electric Discount & Energy Competition Act (EDECA) to restructure the electric power industry in New Jersey. This law deregulated the retail electric markets, allowing all consumers to shop for service from competitive electric suppliers. The intent was to create a more competitive market for electric power supply in New Jersey. As a result, utilities were allowed to charge Cost of Service and customers were given the ability to choose a third-party (i.e. non-utility) energy supplier.

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for your facility's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third party electric suppliers. If your facility is purchasing electricity from a third-party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third-party electric suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey has also been deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate on a monthly basis. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier is typically dependent upon whether a customer seeks budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility is not purchasing natural gas from a third-party supplier, consider shopping for a reduced rate from third party natural gas suppliers. If your facility is purchasing natural gas from a third-party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third-party natural gas suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
5th St - Pump Cellar	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	208	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	208	0.12	33	0.0	$3.33	$214.00	$20.00	58.19
5th St - Pump Cellar	1	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	208	Fixture Replacement	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	208	0.10	29	0.0	$2.91	$167.00	$0.00	57.36
5th St - Mid Level	5	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	208	Relamp & Reballast	No	5	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	208	0.29	83	0.0	$8.34	$535.00	$50.00	58.19
5th St - Stairwell	2	High-Pressure Sodium: (1) 150W Lamp	Wall Switch	188	208	None	No	2	High-Pressure Sodium: (1) 150W Lamp	Wall Switch	188	208	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
5th St - Switchgear room	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	208	Relamp & Reballast	No	3	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	208	0.17	50	0.0	$5.00	$321.00	$30.00	58.19
11th St - Upper Level	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	208	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	208	0.06	17	0.0	$1.67	$107.00	$10.00	58.19
11th St - Valve Room, lower level	5	CFL Screw-In Lamps: Screw in socket	Wall Switch	40	208	Relamp	No	5	LED Screw-In Lamps: 1 7W LED lamp	Wall Switch	7	208	0.13	39	0.0	$3.87	$219.77	$50.00	43.82
11th St - Walkway	2	Linear Fluorescent - T12: 8' T12 (75W) - 1L	Wall Switch	92	208	Fixture Replacement	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	208	0.12	35	0.0	$3.52	$334.00	$20.00	89.16
18th St - Bar Screen	3	Metal Halide: (1) 100W Lamp	Wall Switch	128	208	None	No	3	Metal Halide: (1) 100W Lamp	Wall Switch	128	208	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St - CSO Pump Rm	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	208	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	208	0.12	33	0.0	$3.33	$214.00	$20.00	58.19
18th St - CSO Pump Rm	9	Mercury Vapor: (1) 150W Lamp	Wall Switch	150	208	None	No	9	Mercury Vapor: (1) 150W Lamp	Wall Switch	150	208	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St - Pump Cellar	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	208	Relamp & Reballast	No	3	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	208	0.17	50	0.0	$5.00	$321.00	$30.00	58.19
18th St - Pump Cellar	1	Metal Halide: (1) 150W Lamp	Wall Switch	100	208	None	No	1	Metal Halide: (1) 150W Lamp	Wall Switch	100	208	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18/th St - Yard Lights	2	Metal Halide: (1) 150W Lamp	None	190	4,368	None	No	2	Metal Halide: (1) 150W Lamp	None	190	4,368	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Baldwin - Ceiling	2	Incandescent: 60 W screw-in lamps	Wall Switch	60	208	Relamp	No	2	LED Screw-In Lamps: 1 7W LED lamp	Wall Switch	7	208	0.09	25	0.0	$2.49	$87.91	$20.00	27.28
Pl#1 - Ceiling	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	None	No	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pl#2 - Ceiling	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	None	No	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pl#3 - Ceiling	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	None	No	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
H1 - 2nd Floor	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	208	None	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	208	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
H1 - 2nd Floor Stairwell	10	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	8,760	None	No	10	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
H1 - 1st Floor Stairwell	5	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	8,760	None	No	5	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
H1 - Generator Rm	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	None	No	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
5th St	Pump #1	1	Process Pump	85.0	94.1%	Yes	8,760	No	94.1%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
5th St	Pump #2	1	Process Pump	85.0	94.1%	Yes	2,190	No	94.1%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
5th St	Pump #3	1	Process Pump	85.0	94.1%	Yes	1,200	No	94.1%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
5th St	Dry Well Sump Pump	1	Other	5.0	87.5%	No	100	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
5th St	Odor Control Unit	1	Exhaust Fan	3.0	87.5%	No	100	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
11th St	Sewage Pump #1	1	Process Pump	74.0	93.6%	Yes	0	No	93.6%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
11th St	Sewage Pump #2	1	Process Pump	74.0	93.6%	Yes	1,000	No	93.6%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
11th St	Sewage Pump #3	1	Process Pump	74.0	93.6%	Yes	2,600	No	93.6%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
11th St	Odor Control Unit	1	Exhaust Fan	3.0	87.5%	No	100	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
11th St	Wet Well Odor Control Unit	1	Exhaust Fan	3.0	87.5%	No	100	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	CSO #1	1	Process Pump	250.0	95.0%	Yes	0	No	95.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	CSO #2	1	Process Pump	250.0	95.0%	Yes	0	No	95.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	Sanitary Pump #1	1	Process Pump	75.0	94.1%	Yes	0	No	94.1%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	Sanitary Pump #2	1	Process Pump	75.0	94.1%	Yes	2,000	No	94.1%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	Sanitary Pump #3	1	Process Pump	75.0	94.1%	Yes	4,000	No	94.1%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	Dry Pit Sump Pump #1	1	Other	5.0	87.5%	No	100	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	Dry Pit Sump Pump #2	1	Other	5.0	87.5%	No	100	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	Bar Screen	1	Other	2.0	84.0%	No	2,190	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	Exhaust Fans	2	Exhaust Fan	3.0	87.5%	No	2,190	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
18th St	Odor control	1	Exhaust Fan	5.0	87.5%	No	2,190	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Baldwin	Pump #1	1	Process Pump	20.0	91.0%	Yes	4,380	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Baldwin	Pump #2	1	Process Pump	20.0	91.0%	Yes	1,840	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Baldwin	Exhaust Fan	1	Exhaust Fan	3.0	87.5%	No	100	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#1	Pump #1	1	Process Pump	10.0	89.5%	Yes	500	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#1	Pump #2	1	Process Pump	10.0	89.5%	Yes	4,000	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#1	Pump #3	1	Process Pump	10.0	89.5%	Yes	8,760	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#1	Muffin Monster	1	Other	3.0	87.5%	No	8,760	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
PI#1	Wet Well Exhaust	1	Exhaust Fan	2.0	84.0%	No	100	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#1	Valve Vault Exhaust	1	Exhaust Fan	2.0	84.0%	No	100	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#2	Pump #1	1	Process Pump	30.0	92.4%	Yes	100	No	92.4%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#2	Pump #2	1	Process Pump	30.0	92.4%	Yes	2,000	No	92.4%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#2	Pump #3	1	Process Pump	30.0	92.4%	Yes	4,000	No	92.4%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#2	Muffin Monster	1	Other	3.0	87.5%	No	4,000	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#2	Wet Well Exhaust	1	Exhaust Fan	2.0	84.0%	No	100	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#2	Valve Vault Exhaust	1	Exhaust Fan	2.0	84.0%	No	100	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#3	Pump #1	1	Process Pump	30.0	92.4%	Yes	100	No	92.4%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#3	Pump #2	1	Process Pump	30.0	92.4%	Yes	6,000	No	92.4%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#3	Pump #3	1	Process Pump	30.0	92.4%	Yes	8,760	No	92.4%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#3	Muffin Monster	1	Other	3.0	87.5%	No	8,760	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#3	Wet Well Exhaust	1	Exhaust Fan	2.0	84.0%	No	100	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
PI#3	Valve Vault Exhaust	1	Exhaust Fan	2.0	84.0%	No	100	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
49th	Pump #1	1	Process Pump	7.5	89.5%	Yes	600	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
49th	Pump #2	1	Process Pump	7.5	89.5%	Yes	600	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Liberty	Pump #1	1	Process Pump	3.0	87.5%	Yes	3,800	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Liberty	Pump #2	1	Process Pump	3.0	87.5%	Yes	3,800	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Wet Weather Pump #1	1	Process Pump	250.0	0.0%	Yes	0	No	0.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Wet Weather Pump #2	1	Process Pump	250.0	0.0%	Yes	0	No	0.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Sump Pump	1	Other	5.0	87.5%	No	100	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Bar Screen 1	1	Other	2.0	84.0%	No	0	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Bar Screen 2	1	Other	2.0	84.0%	No	0	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
18th Street	CSO Room	2	Warm Air Unit Heater	120.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00