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August 25, 2010

Local Government Energy Program
Energy Audit Report

For

City of New Brunswick
Delaware & Raritan Canal Pump Station

800-998 George St
New Brunswick, NJ 08901

Project Number: LGEA63

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INTRODUCTION

On April 30th, Steven Winter Associates, Inc. (SWA) and PMK Group, a business unit of Birdsall Services Group (BSG-PMK), performed an energy audit and assessment of the D&R Canal Pump Station in The City of New Brunswick, NJ. Current conditions and energy-related information were collected in order to analyze and facilitate the implementation of energy conservation measures for the building.

The D&R Canal Pump Station is a partial two-story building totaling 2,900 square feet. The D&R Canal Pump Station contains; pump station equipment areas, an office and a bathroom.

The D&R Canal Pump Station is occupied sporadically.

Energy data and building information collected in the field were analyzed to determine the baseline energy performance of the building. Using spreadsheet-based calculation methods, SWA and PMK estimated the energy and cost savings associated with the installation of each of the recommended energy conservation measures. The findings for the building are summarized in this report.

The goal of this energy audit is to provide sufficient information to make decisions regarding the implementation of the most appropriate and most cost effective energy conservation measures for the building.

Launched in 2008, the LGEA Program provides subsidized energy audits for municipal and local government-owned facilities, including offices, courtrooms, town halls, police and fire stations, sanitation buildings, transportation structures, schools and community centers. The Program will subsidize 75% of the cost of the audit. If the net cost of the installed measures recommended by the audit, after applying eligible NJ SmartStart Buildings incentives, exceeds the remaining cost of the audit, then that additional 25% will also be paid by the program. The Board of Public Utilities (BPU's) Office of Clean Energy has assigned TRC Energy Services to administer the Program.

EXECUTIVE SUMMARY

This document contains the energy audit report for the D&R Canal Pump Station in The City of New Brunswick, NJ 08901.

Based on the field visit performed by Steven Winter Associates (SWA) and PMK staff on April 30th, 2010 and the results of a comprehensive energy analysis, this report describes the site's current conditions and recommendations for improvements. Suggestions for measures related to energy conservation and improved comfort are provided in the scope of work. Energy and resource savings are estimated for each measure that results in a reduction of heating, cooling, and electric usage.

Current conditions

In the most recent full year of data collected, April, 2009 through February, 2010, the D&R Canal Pump Station consumed a total of 2,601,670 kWh of electricity for a total cost of $293,445. In the most recent full year of No. 2 heating oil data collected, April, 2009 through March, 2010, 2,485 gallons of heating oil were consumed for a total cost of $6,360. With electricity and heating oil combined, the building consumed 9225 MMBtus of energy at a total cost of $299,805.

SWA/BSG-PMK has entered energy information about the D&R Canal Pump Station in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The building was classified as a Water Treatment/Distribution building preventing it from receiving a performance rating. Buildings achieving an Energy Star rating of 75 are eligible to apply for the Energy Star award and receive the Energy Star plaque to convey superior performance. These ratings also greatly help when applying for Leadership in Energy and Environmental Design (LEED) building certification through the United States Green Building Council (USGBC).

The Site Energy Use Intensity is 1 kBtu/gpd compared to the national average of a similar building consuming 2 kBtu/gpd. Implementing the recommendations included in this report will reduce the building energy consumption by approximately 1,279.5 kBtu/ft^{2}yr. There may be energy procurement opportunities for City of New Brunswick to reduce annual utility costs, which are $2,035/yr higher, when compared to the other City owned building's utility rates.

Based on the assessment of the D&R Canal Pump Station, SWA/BSG-PMK has separated the recommendations into three categories (See Section 4 for more details). These are summarized as follows:

Category I Recommendations: Capital Improvements:

At this time there are no capital improvements recommended by SWA/BSG-PMK.

Category II: Operations & Maintenance:

- Caulk and seal exterior wall penetrations
- Monitor moisture build up deteriorating interior wall finishes, repair as needed
- Replace missing slate shingles
- Replace exterior wood trim and returns
- Replace damaged door and frame
- Due to the minimal occupancy and use of the lights at the pump station, it is recommended that lamps be replaced with energy efficient upgrades, as outlined in Appendix A, on an as fail basis.

Category III: Energy Conservation Measures:

At this time, SWA/BSG-PMK highly recommends a total of **4** Energy Conservation Measures (ECMs) for the D&R Canal Pump Station that are summarized in the following table. The total investment cost for these ECMs, with incentives, is **$799,105** (based on a projected eligibility for New Jersey's Office of Clean Energy current incentive and rebate programs). SWA/BSG-PMK estimates a first year savings of **$78,553** with an aggregated simple payback of approximately **10.2 years**. SWA/BSG-PMK estimates that implementing the highly recommended ECMs will reduce the carbon footprint of the facility by **956,467 lbs of CO_2**.

The recommended ECMs and the list below are cost-effective energy efficiency measures and building upgrades that will reduce operating expenses for the City of New Brunswick. Based on the requirements of the LGEA program, the City of New Brunswick must commit to implementing some of these measures, and must submit paperwork to the Local Government Energy Audit program within one year of this report's approval to demonstrate that they have spent, net of other NJCEP incentives, at least 25% of the cost of the audit (per building). The minimum amount to be spent, net of other NJCEP incentives, is $369.25.

SWA recommends that the City of New Brunswick enroll in the following incentive programs through the NJ Office of Clean Energy in order to reduce the installation costs of most measures:

- Direct Install
- SmartStart

The building would not qualify for the Pay-for-Performance program since the energy audit did not show that source energy consumption could not be reduced by 15+%.

Please refer to Appendix C for further details.

The following table summarizes the proposed Energy Conservation Measures (ECM) and their economic relevance:

ROI: Return on Investment (%)

Assumptions:

Discount rate:	3.2%	per DOE FEMP guidelines	Electricity rate	$0.11	$/kWh		
Energy price escalation rate:	0%	per DOE FEMP guidelines	Heating oil rate	$2.54	$/gal	equiv. to	$1.81 $/therm
			Gas rate	$1.25	$/therm	(projected)	

Avg. Annual Demand: 0.00149

Area of Building (SF): 1,875

Table 1 - Highly Recommended 0-5 Year Payback ECMs

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO_2 Reduced, lbs/yr
1	Tankless Water Heater	Vendor Website	$350	$0	$350	1,989	0.25	0	3.62	$0.00	$219	15	$2,574	1.60	635%	42%	62%	$2,261	2,724
2	Convert Boiler to Gas & Install OAR	Similar Projects	$4,000	$0	$4,000	0	0.00	238	12.72	$0	$1,980	21	$29,942	2.02	649%	31%	49%	$26,521	2,790
TOTAL			$4,350	$0	$4,350	1,989	0.25	238	16.34	$0.00	$2,199	-	$32,516	1.98	-	-	-	$28,783	5,514

Table 2 - Recommended End-of-Life ECMs

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO_2 Reduced, lbs/yr
3	Lighting Upgrades	Empirical Data	$1,440	$285	$1,155	180	0.02	0	0.33	$0	$20	15	$233	58.28	-80%	-5%	0%	-$918	247
4	Premium-Efficiency Motors & Pumps	Contractor	$795,000	$1,400	$793,600	693,946	86.21	0	1,262.85	$0	$76,334	18	$1,032,328	10.40	30%	2%	7%	$256,262.05	950,706.53
TOTAL			$796,440	$1,685	$794,755	694,127	86.23	0	1,263.18	$0.00	$76,354	-	$1,032,561	10.41	-	-	-	$255,343.66	950,953.37

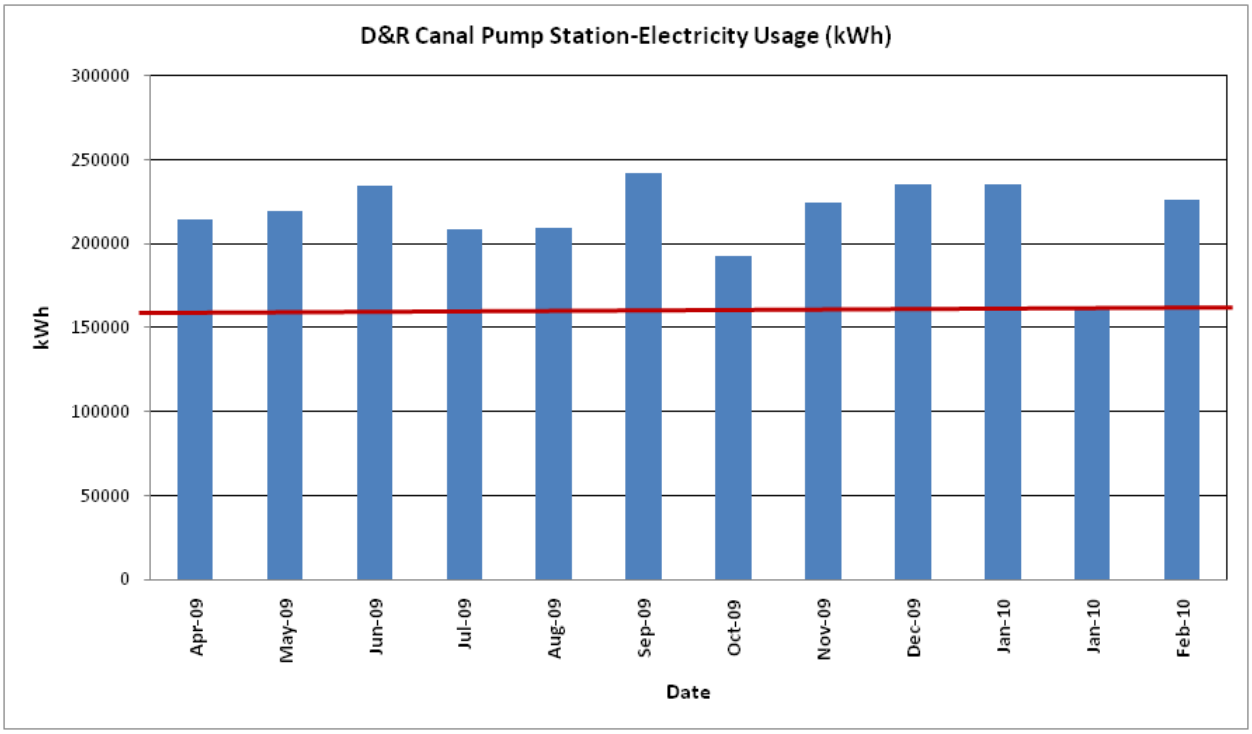
1. HISTORIC ENERGY CONSUMPTION

1.1. Energy Usage and Cost Analysis

SWA/BSG-PMK analyzed utility bills that were received from the utility company supplying the D & R Canal Pump Station building with electric and No. 2 heating oil from April, 2009 through March, 2010.

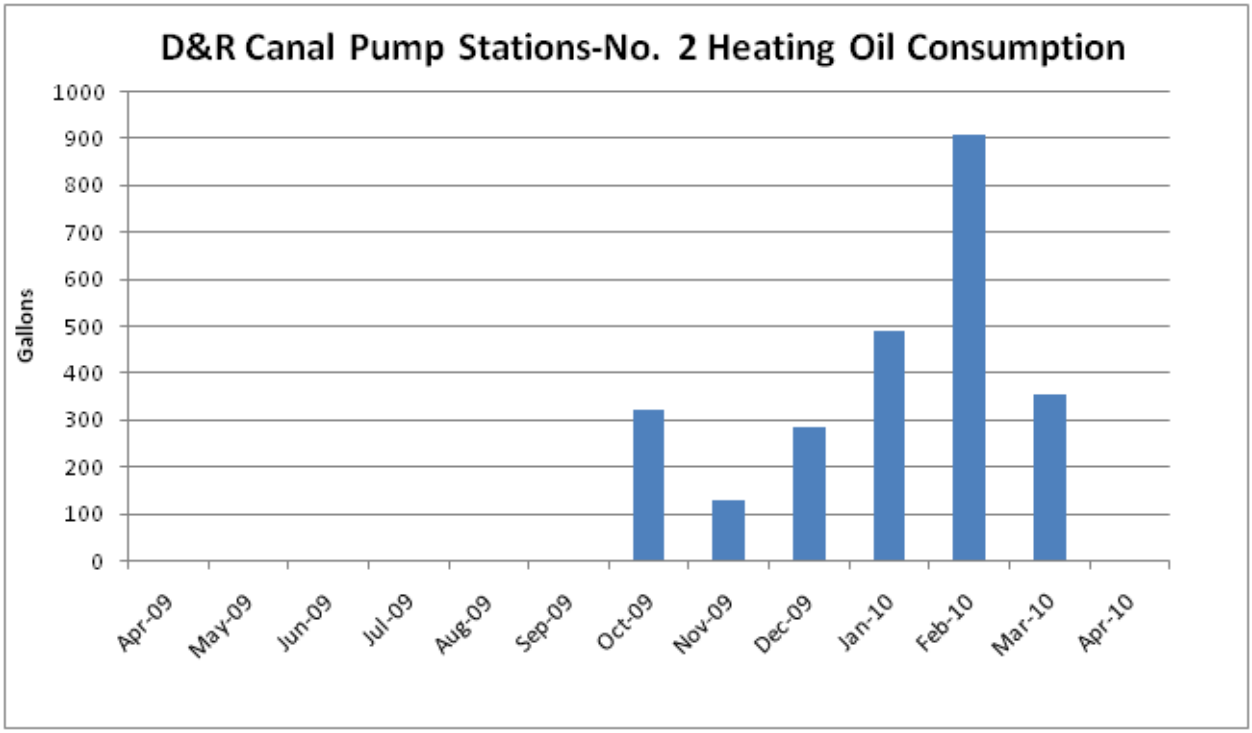
Electricity – The D & R Canal Pump Station building is currently served by one electric meter. The facility currently receives electricity distribution from Public Service Electric & Gas and electricity supply from Direct Energy at **an average rate of $0.11/kWh** based on 12 billing periods of utility bills from April, 2009 through February, 2010. The facility consumed **approximately 2,601,670 kWh or $293,445 worth of electricity** in the previous year with an average monthly demand of 321.8 kW.

The following charts show electricity usage for the D & R Canal Pump Station building based on utility bills for the billing analysis period. The red line indicates the estimated base-load in kWh.



No.2 Heating Oil – The D & R Canal Pump Station building is currently receives heating oil from Allied Oil Co. at **an average aggregated rate of $2.54/gal** based on 12 months of utility bills for April, 2009 through March, 2010. The facility consumed **approximately 2,485 gallons or $6,360 worth of natural gas** in the previous year.

The following chart shows the heating oil usage for the D & R Canal Pump Station building based on utility bills for the analysis period of April, 2009 through March, 2010



The heating oil usage mimics seasonal needs for heating the buildings showing that heating oil is primarily used for heating. The red line indicates the base-load level for the heating.

1.2. Utility Rate

The D & R Canal Pump Station building currently receives electricity from Public Service Electric & Gas and Direct Energy at a general service market rate for electricity use (kWh) with (kW) demand charge. The facility currently pays an average rate of approximately $0.11/kWh based on the most recent 12 months of utility bills.

The D & R Canal Pump Station building currently receives No. 2 heating oil supply from Allied Oil Co. at a general service market rate for heating oil in gallons. There is one tank that provides heating oil service to the facility. The average aggregated rate (supply and transport) for the heating oil is approximately $2.54/gal based on the most recent 12 months of utility bills.

1.3. Energy Benchmarking

SWA/BSG-PMK has entered energy information about the D & R Canal Pump Station building in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The username is *cityofnewbrunswick* and the password is *newbrunswick*. The building was classified as a Water Treatment space preventing it from earning a performance rating which can be used to achieve an Energy Star building certification.

The Site Energy Use Intensity is 1 kBtu/gpd compared to the national average of buildings classified as Water Treatment space consuming 2 kBtu/gpd. Implementing this report's recommended Energy Conservations Measures (ECMs) will reduce use by approximately 1,279.5 kBtu/sq.ft./yr.

SWA/BSG-PMK has created the Portfolio Manager site information for New Brunswick City Hall. This information can be accessed at: https://www.energystar.gov/istar/pmpam/, with the following:

Username: *cityofnewbrunswick*
Password: *newbrunswick*

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
D&R Canal Pump Station

Building ID: 2368892
For 12-month Period Ending: March 31, 2010[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: June 28, 2010

Facility	Facility Owner	Primary Contact for this Facility
D&R Canal Pump Station 800-998 George St New Brunswick, NJ 08901	City of New Brunswick 76 Bayard St New Brunswick, NJ 08901	Chris Butler 76 Bayard St New Brunswick, NJ 08901

Year Built: 1950
Energy Performance Rating[2] (1-100) N/A

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	8,876,898
Fuel Oil (No. 2) (kBtu)	344,674
Natural Gas - (kBtu)[4]	0
Total Energy (kBtu)	9,221,572

Energy Intensity[5]	
Site (kBtu/gpd)	1
Source (kBtu/gpd)	3

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	1,377

Electric Distribution Utility
Public Service Elec & Gas Co

National Average Comparison	
National Average Site EUI	2
National Average Source EUI	8
% Difference from National Average Source EUI	-64%
Building Type	Water Treatment

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Certifying Professional
N/A

Meets Industry Standards[6] for Indoor Environmental Conditions:	
Ventilation for Acceptable Indoor Air Quality	**N/A**
Acceptable Thermal Environmental Conditions	**N/A**
Adequate Illumination	**N/A**

Notes:
1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

EPA Form 5900-16

2. FACILITY AND SYSTEMS DESCRIPTION

This section gives an overview of the current state of the facility and systems. Please refer to the Proposed Further Recommendations section for recommendations for improvement.

Based on visits from SWA on Friday, May 07, 2010, the following data was collected and analyzed.

2.1. Building Characteristics

The partial two-story, (slab on grade), 2,900 square feet D & R Canal Pump Station building was constructed in 1874 . It houses pump station equipment areas, an office and a bathroom.

Front and Side Façade

Partial Rear Façade (typ.)

2.2. Building occupancy profiles

Its occupancy is sporadic.

2.3. Building Envelope

Due to unfavorable weather conditions (min. 18 deg. F delta-T in/outside and no/low wind), no exterior envelope infrared (IR) images were taken during the field audit.

General Note: All findings and recommendations on the exterior envelope (base, walls, roofs, doors and windows) are based on the energy auditors' experience and expertise, on construction document reviews (if available) and on detailed visual analysis, as far as accessibility and weather conditions allowed at the time of the field audit.

2.3.1. Exterior Walls

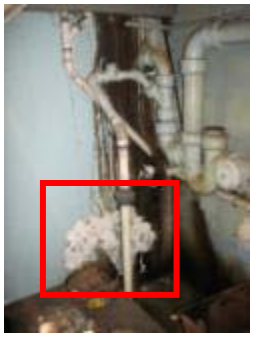
The exterior wall envelope is mostly constructed of brick veneer over concrete block with no wall insulation. The interior is mostly glazed tile finish.

Note: Wall insulation levels could not be verified in the field and are based on reports from building management.

Exterior and interior wall surfaces were inspected during the field audit. They were found to be in overall acceptable, age-appropriate condition with only a few signs of uncontrolled moisture, air-leakage or other energy-compromising issues.

The following specific exterior wall problem spots and areas were identified:

Un-caulked/un-sealed exterior wall penetrations



Deteriorating interior wall finishes due to moisture exposure

2.3.2. Roof

The building's roof is predominantly a low-pitch gable type over a steel structure, with a slate shingle finish. It is original. Zero inches of detectable roof insulation were recorded.

Note: Roof insulation levels could visually be verified in the field by non-destructive methods.

Roofs, related flashing, gutters and downspouts were inspected during the field audit. They were reported to be in overall acceptable condition, with only a few signs of uncontrolled moisture, air-leakage or other energy-compromising issues.

The following specific roof problem spots were identified:

Cracked/missing slate tiles

Deteriorating exterior wood crown trim and returns.

2.3.3. Base

The building's base is composed of a slab on and below grade floor with a perimeter foundation and no detectable slab edge/perimeter insulation.

Slab/perimeter insulation levels could not be verified in the field or on construction plans, and are based upon similar wall types and time of construction.

The building's base and its perimeter were inspected for signs of uncontrolled moisture or water presence and other energy-compromising issues. Overall the base was reported to be in acceptable condition with no signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

2.3.4. Windows

The building contains basically one type of window.

- Single-hung type windows with a non-insulated aluminum frame, clear single glazing and no interior or exterior shading devices. The windows are located throughout the building and were replaced many year ago, date unknown.

Windows, shading devices, sills, related flashing and caulking were inspected as far as accessibility allowed for signs of moisture, air-leakage and other energy compromising issues. Overall, the windows were found to be in acceptable and use-appropriate condition with no serious signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

2.3.5. Exterior Doors

The building contains only one type of exterior door.

- Glass with aluminum or wood frame type exterior doors. They are located throughout the building and were replaced at an unknown date.

All exterior doors, thresholds, related flashing, caulking and weather-stripping were inspected for signs of moisture, air-leakage and other energy-compromising issues. Overall, the doors were found to be in acceptable condition with only a few signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

The following specific door problem spot was identified:

Damaged door and frame

2.3.6. Building Air Tightness

Overall the field auditors found the building to be reasonably air-tight with only a few areas of suggested improvements, as described in more detail earlier in this chapter.

The air tightness of buildings helps maximize all other implemented energy measures and investments, and minimizes potentially costly long-term maintenance, repair and replacement expenses.

2.4. HVAC systems

2.4.1. Heating

Heating is provided by an oil-fired Burnham steam boiler, installed in 2004. The unit is rated at 201 MBH and 75% efficiency. It feeds radiators and five (5) unit heaters.

Burnham boiler

Category III Recommendation – ECM #2: Convert the boiler to natural gas by installing a new burner and extending the gas line to the burner, and install hot water outdoor air reset control (OAR). These controllers reduce the maximum boiler water temperature depending on the outside air temperature; for instance, if the outside air temperature is 0°F, the boiler temperature will be 180°F, but if the outside air temperature is 40°F, the boiler temperature will only need to be 130°F.Outdoor air reset generally decreases heating costs by 8-15%.

2.4.2. Cooling

The only cooling unit in the facility is an Emerson through-the-wall air-conditioner in the office, which does not have a nameplate.

2.4.3. Ventilation

There are no exhaust fans at the facility; the only ventilation is provided by flues, doors, and windows.

2.4.4. Domestic Hot Water

Domestic hot water is provided by a 30-gallon Rheem electric water heater, which serves the bathroom sink.

Category III Recommendations – ECM #1: Replace the current electric water heater, which has reached the end of its useful life, with a tankless, point-of-use water heater.

2.5. Electrical systems

2.5.1. Lighting

A complete inventory of all interior, exterior, and exit sign light fixtures were examined and documented in Appendix A of this report including an estimated total lighting power consumption. The facility consists primarily of T12 Fluorescent fixtures with magnetic ballasts.

Category I Recommendation – ECM #3: Due to the minimal occupancy and use of the lights at the pump station, it is recommended that lamps be replaced with energy efficient upgrades, as outlined in Appendix A, on an as fail basis.

2.5.2. Appliances and Process

Appliances:

The only appliance at this facility is a Samsung microwave.

Process:

There are three centrifugal pumps at this facility. The largest pump is a 12,361 GPM Byron Jackson pump with a 700 HP Continental motor. Pump #1 is a 10,800 GPM De Laval pump with a 600 HP Ideal Electric motor. Pump #2 has a 250 HP Electric Machinery Manufacturing Co. motor. There is also a Jeffrey traveling water screen and an EMSE Corp. air compressor, which has two 3 HP Baldor motors.

Centrifugal pump

Category III Recommendations – ECM #4: Replace Pump #1 and Pump #2, which have passed the end of their useful life; additionally, replace their motors with premium-efficiency motors.

2.5.3. Elevators

There are no elevators at this facility.

3. Building Systems Equipment List

D&R Pump Station							
Building System	Description	Locations	Model #	Fuel	Space Served	Year Installed	Estimt aed. Remai ning Useful Life %
Heating	Unit heater	Storage	Nameplate painted over	Steam	Storage	Approx. 1985	0%
Heating	Boiler, steam; 201/151 MBH input/output, 75% efficient	Boiler room	Burnham, M# PV86SC-HBUN, S# 64747127	#2 heating oil	Unit heaters, unit ventilators	2004	80%
Heating	Unit heater	Control room	Trane, M# UHSA-020S-2C-AAA, S# D86F05827	Steam	Control room	1989	0%
Heating	Unit ventilator	Office	No nameplate	Steam	Office	Approx. 1985	0%
Heating	(3) unit heaters	Pump room	Not accessible	Steam	Pump room	Approx. 1985	0%
Cooling	Through-the-wall air-conditioner	Office	Emerson (nameplate torn off)	Elecricity	Office	Approx. 1995	0%
Domestic Hot Water	Electric water heater; 30 gallons, 4.5 kW	Boiler room	Rheem, M# 81V30D, S# 1198B07089	Elecricity	Sink	1998	20%
Appliance s	Microwave	Control room	Samsung, M# RE-5250, S# 40518897	Elecricity	Control room	1984	0%
Pumping	Pump; 12,361 GPM, 885 RPM, 188' head	Control room	Byron Jackson, M# 32 KXH 2STG, S# 851W0014	Elecricity	Process	1950	20%
	Pump motor; 700 HP, 880 RPM		Continental Electro-Power, Frame # NV943P, S# I65713				
Pumping	Pump #2; 250 HP, 1,175 RPM	Pump room	Electric Machinery Mfg. Co., Frame # 2315-S, Type # 1C, S# 106618	Elecricity	Process	1950	20%
Pumping	Pump #1; 10,800 GPM, 1,120 RPM, 170' head	Pump room	De Laval Turbine, Frame # P1816, S# 702729	Elecricity	Process	1980	50%
	Pump motor; 600 HP, 1,180 RPM		Ideal Electric, Frame # 3903-S, Type AV, S# 251212				

Process	Traveling water screen	Pump room	Jeffrey, Type BASKET, S# 347	Elecricity	Process	1980	50%
Compressed Air	Air compressor	Pump room	EMSE Corp., M# 3DW3, Type DUPLEX, S# 117 A	Elecricity	Process	not available	75%
	Air compressor motor #1; 3 HP, 3,450 RPM, 81% efficient		Baldor, Frame # 182CZ, Spec. # 36E663-105, S# F486				
	Air compressor motor #2; 3 HP, 3,450 RPM, 81% efficient		Baldor, Frame # 182CZ, Spec. # 36E663-105, S# F486				

Note: *****The remaining useful life of a system (in %) is the relationship between the system manufactured and / or installed date and the standard life expectancy of similar equipment based on ASHRAE (2003), ASHRAE Handbook: HVAC Applications, Chapter 36.

4. ENERGY CONSERVATION MEASURES

Based on the assessment of this building, SWA and BSG-PMK have separated the investment opportunities into three categories of recommendations:

1. Capital Improvements – Upgrades not directly associated with energy savings
2. Operations and Maintenance – Low Cost/No Cost Measures
3. Energy Conservation Measures – Higher cost upgrades with associated energy savings

Category I Recommendations: Capital Improvements:

At this time there are no capital improvements recommended by SWA/BSG-PMK.

Category II: Operations & Maintenance:

- Caulk and seal exterior wall penetrations
- Monitor moisture build up deteriorating interior wall finishes, repair as needed
- Replace missing slate shingles
- Replace exterior wood trim and returns
- Replace damaged door and frame
- Due to the minimal occupancy and use of the lights at the pump station, it is recommended that lamps be replaced with energy efficient upgrades, as outlined in Appendix A, on an as fail basis.

Category III Recommendations: Energy Conservation Measures:

Summary Table

ECM #	Description
1	Tankless Water Heater
2	Convert Boiler to Gas & Install OAR
3	Lighting Upgrades
4	Premium-Efficiency Motors & Pumps

ECM #1: Point-of-Use Tankless Water Heater

Description:

Domestic hot water is provided by an electric water heater with a 30-gallon tank, which was installed in 1998 and is nearing the end of its useful life. Due to the fact that this unit only services one restroom sink, which is seldom used, it is recommended that this unit be replaced with a small point-of-use tankless water heater. The existing unit keeps 30-gallons of water heated 24 hours-per-day; by comparison, a tankless water heater has a volume of only 2.75 gallons, and the unit would only heat the water when the sink is in use.

Installation cost:

Estimated installed cost: Installation: $350 (Equipment: $160)
Source of cost estimate: Vendor website

Economics:

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO_2 Reduced, lbs/yr
1	Tankless Water Heater	Vendor Website	$350	$0	$350	1,989	0.25	0	3.62	$0.00	$219	15	$2,574	1.60	635%	42%	62%	$2,261	2,724

Assumptions:

Using 12 months of the facility's electricity bills, it was determined that the cost of electricity is currently $0.11/kWh.

To calculate the savings from switching from electricity to gas, a spreadsheet created by Rheem was used. The temperature rise of the heated water was set at 77°F on the spreadsheet, and the energy factor (a unit that specifies the efficiency of water heaters) is specified as 0.94 for electric units with and without a tank. Weight of water was set at 8.33 pounds/gal. Using this data, the BTUs of output heat used for heating the water were calculated by the following equation:

$BTUs_{output} = Vol. \times Wt._{Water} \times \Delta Temp.$

The actual BTUs purchased by each unit are calculated using these values and the energy factors:

$$BTUs_{input} = \frac{BTUs_{output}}{\text{Energy Factor}}$$

The annual costs for heating the water can now be calculated using this data:

Rebates/financial incentives:

No rebates for electric water heaters could be found.

ECM #2: Convert Boiler to Gas and Install Hot Water Outdoor Air Reset Control

Description:

Heating is provided by a Burnham 201 MBH, oil-fired steam boiler. The unit is in good condition, and can be made even more energy-efficient with the installation of hot water outdoor air reset control. These controllers reduce the maximum boiler water temperature depending on the outside air temperature; for instance, if the outside air temperature is 0°F, the boiler temperature will be 180°F, but if the outside air temperature is 40°F, the boiler temperature will only need to be 130°F. Outdoor air reset generally decreases heating costs by 8-15%. Additionally, the boiler can be made more cost-efficient by switching the heating fuel from oil to natural gas. Oil is purchased at a cost of $2.54 per gallon, equivalent to $1.81 per therm; by comparison, other buildings in New Brunswick purchase gas for about $1.25 per therm. The conversion to natural gas requires piping and the purchase of a gas burner.

Installation cost:

Estimated installed cost: $2,000 for OAR, $2,000 for the conversion to natural gas, $4,000 total
Source of cost estimate: Similar projects, vendor website

Economics:

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO2 Reduced, lbs/yr
2	Convert Boiler to Gas & Install OAR	Similar Projects	$4,000	$0	$4,000	0	0.00	238.45	12.72	$0	$1,980	$21	$29,942	2.02	649%	31%	49%	$26,521	2,790

Assumptions:

Taken from the energy bills were the annual heating consumption for the boiler, 2,129 gallons; this is equivalent to 2,981 therms. The boiler is the only oil-consuming unit in the building. Converting to natural gas would not decrease the number of therms consumed, but the cost per therm would decrease. OAR would save 8% of the boiler's annual energy consumption.

Rebates/financial incentives:

No rebates for OAR or converting to natural gas were found.

ECM #3: Lighting Upgrades & Occupancy Sensors

Description:

Lighting at the D & R Canal Pump Station primarily consists of standard-efficiency fixtures with T12 lamps and magnetic ballasts. SWA/BSG-PMK recommends retrofitting the T12 fixtures with T8 lamps and electronic ballasts and replacing the incandescent fixtures with compact fluorescent lamps. Lighting replacements typically yield a short payback and should because of the low cost to upgrade combined favorable energy savings.

Recommended lighting upgrades are detailed in Appendix A.

Installation cost:

	Lighting
Cost	$1,440.00
Rebate	$285.00
Net Cost	$1,155.00
Savings (kWh)	180
Savings ($)	$19.82
Payback	58.3

Source of cost estimate: Empirical Data

Economics:

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO2 Reduced, lbs/yr
3	Lighting Upgrades	Empirical Data	$1,440	$285	$1,155	180	0.02	0	0.33	$0	$20	15	$233	58.28	-80%	-5%	0%	-$918	247

Assumptions:

The electric cost used in this ECM was $0.11/kWh, which was the facilities' average rate for the 12-month period from February, 2009 through January, 2010. The replacements for each lighting fixture, the costs to replace or retrofit each one, and the rebates and wattages for each fixture are located in Appendix A.

Rebates/financial incentives:

The New Jersey SmartStart offers rebates for upgrading lighting fixtures and installing lighting controls. The total rebate this ECM qualifies for is $285.

ECM #4: Premium-Efficiency Motors & Pumps

Description:

At the D&R Pump Station, pumping is performed by three pumps, all of which have reached the end of their useful lives. It is recommended that Pumps #1 & 2 be replaced, this is further explained below. Pump #1 is rated at 16 MGD with a 600 HP motor equipped with a variable-frequency drive (VFD). Pump #1 was not functional at the time of the audit. Pump #2, rated at 8 MGD with a 250 HP constant-velocity motor, was in operation for 683 hours in the calendar year beginning in June, 2009 and ending in May, 2010. Pump #3, equipped with a VFD, is rated at 17.2 MGD with a 700 HP motor. This pump was in operation for a total of 6,409 hours in the past year. VFDs allow motors to use 50% less power when the pump is running at 70% of its maximum flow rate. At 100% of the maximum flow rate, the motor would consume 100% of its rated power. By contrast, the constant-velocity pumps always run at 100% of their rated power, even when running at 70% of their maximum flow rate. The recommendation for this measure is to replace Pump #1 and Pump #2 with new, 12.5 GPM pumps with premium-efficiency, constant velocity motors. Pump #1 shall serve as the primary pump, performing about 90% of the facility's pumping. Its rated power will be downgraded to 450 HP. Pump #2, upgraded to a rated power of 400 HP, and would perform the remaining 10% of the required pumping. Pump #3 is not recommended for replacement, and would only be in use as a supplementary, back-up pump, in rare instances where Pump #1 and Pump #2 either cannot provide the required flow or are not working properly. Due to the age and condition of the pumps, the efficiency of each pump was estimated to be 85%, with an additional 3.5% decrease due to rewinding. Pumps with high-efficiency, premium motors are available, which have efficiencies of 93%.

Installation cost:

Estimated installed cost: $795,000
Source of cost estimate: Contractor

Economics:

ECM #	ECM description	Source	Est. Installed Cost, $	Est. Incentives, $	Net Est. ECM Cost with Incentives, $	kWh, 1st Yr Savings	kW, Demand Reduction/Mo	Therms, 1st Yr Savings	kBtu/sq ft, 1st Yr Savings	Est. Operating Cost, 1st Yr Savings, $	Total 1st Yr Savings $	Life of Measure, Yrs	Est. Lifetime Energy Cost Savings, $	Simple Payback, Yrs	Lifetime Return on Investment, %	Annual Return on Investment, %	Internal Rate of Return, %	Net Present Value, $	CO_2 Reduced, lbs/yr
4	Premium-Efficiency Motors & Pumps	Contractor	$795,000	$1,400	$793,600	693,946	86.21	0	1262.85	$0	$76,334	18	$1,032,328	10.40	30%	2%	7%	$256,262.05	950,706.53

Assumptions:

The cost of electricity at the D&R Pump Station, taken from twelve months of electricity bills, is currently $0.11/kWh. The horsepower ratings of the three motors were converted to kW by multiplying by a factor of 0.746. It was estimated that the motors have a load factor of 80%. In order for the replacements for Pump #1 and Pump #2 to account for 100% of the pumping performed by Pump #2 and Pump #3 between June, 2009 and

May, 2010, Pump #1 would operate for 8,561 hours, or 90% of the facility's total running time; Pump #2 would run for 951 hours. The electric consumptions of the existing and recommended pumps were calculated using the following equation:

$$\text{Electric input(kWh)} = \frac{\text{Operating hours} \times 0.746 \frac{\text{kW}}{\text{HP}} \times \text{HP} \times \%\text{ of total capacity} \times \text{load factor}}{\text{Efficiency}}$$

Rebates/financial incentives:

This ECM is calculated based on a projected eligibility for New Jersey's SmartStart Rebate, which pays up to $700 per motor, or $1,400 for this measure.

5. ENERGY CONSERVATION MEASURE FUNDING ALTERNATIVES

BSG-PMK/SWA has reviewed several funding options for the purposes of subsidizing the costs for installing the energy conservation measures noted within this report.

Although funding options are constantly changing and updating this project may benefit from enrolling in a number of alternative programs such as the; The NJ SmartStart program with Technical Assistance, alternate funding by applying for financing and competitive grants through the United States Department of Energy as well as local utility incentive programs in an effort to offset a portion of the cost of ECM implementation.

The Smart Start program offers reimbursement incentives for various equipment purchases, and lighting incentives. The benefits and requirements of this program can be found at:

http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings

The Pay-for-Performance program offers incentives for working with an approved contractor to create a scope of work that will reduce source energy consumption by 15+%. Incentives are achieved during various phases of reporting and implementation. The benefits and requirements of this program can be found at:

http://www.njcleanenergy.com/commercial-industrial/programs/pay-performance

Financial assistance is also available through the United States Department of Energy in the form of; Grants, Cooperative Research and development agreements, small business innovation research, and Loan Guarantee Programs. Further information for these programs is available at:

http://www1.eere.energy.gov/financing/types_assistance.html

Local Utility incentives such as a Direct Install Program, offer incentives that can provide up to 80% subsidy of the cost to install particular ECM's. As each utility company has different guidelines and incentives it is important to contact your local utility authority for eligibility in these programs.

Additional funding may also be found through the following funding methods:

- Energy Savings Improvement Program (ESIP) – Public Law 2009, Chapter 4 authorizes government entities to make energy related improvements to their facilities and par for the costs using the value of energy savings that result from the improvements.

- Municipal Bonds – Municipal bonds are a bond issued by a city or other local government, or their agencies. Municipal bonds may be general obligations of the issuer or secured by specified revenues. Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued, although municipal bonds issued for certain purposes may not be tax exempt.

- Power Purchase Agreement – Public Law 2008, Chapter 3 authorizes contractor of up to fifteen (15) years for contracts commonly known as "power purchase agreements." These are programs where the contracting unit (Owner) procures a contract for, in most cases, a third party to install, maintain, and own a renewable energy system.

BSG-PMK/SWA recommends the Owner review the use of the above-listed funding options in addition to utilizing their standard method of financing for facilities upgrades in order to fund the proposed energy conservation measures.

6. RENEWABLE AND DISTRIBUTED ENERGY MEASURES

6.1. Existing systems

There are currently no existing renewable energy systems.

6.2. Solar Photovoltaic

Photovoltaic (PV) technology was considered for installation on the roofs of the D & R Canal Pump Station. Based on the shading and the amount of roof area available with unobstructed southern exposure it was determined that PV installations are not cost effective or feasible for this location.

6.3. Solar Thermal Collectors

Solar thermal collectors are not recommended for this location based on the shading and amount of roof area available with unobstructed southern exposure.

6.4. Combined Heat and Power

Combined Heat Power is not applicable to this project because of the HVAC system type and limited domestic hot water usage.

6.5. Geothermal

Geothermal is not applicable to this project. A geothermal system would require the existing heating distribution system to be removed and replaced with a heat pump system. Large underground vertical or horizontal loop systems would need to be installed beneath the existing concrete pad and asphalt. These modifications to the existing heat distribution system would be extremely disruptive to the use of the building and the surrounding neighborhood in addition to the high cost of such an installation and retrofit.

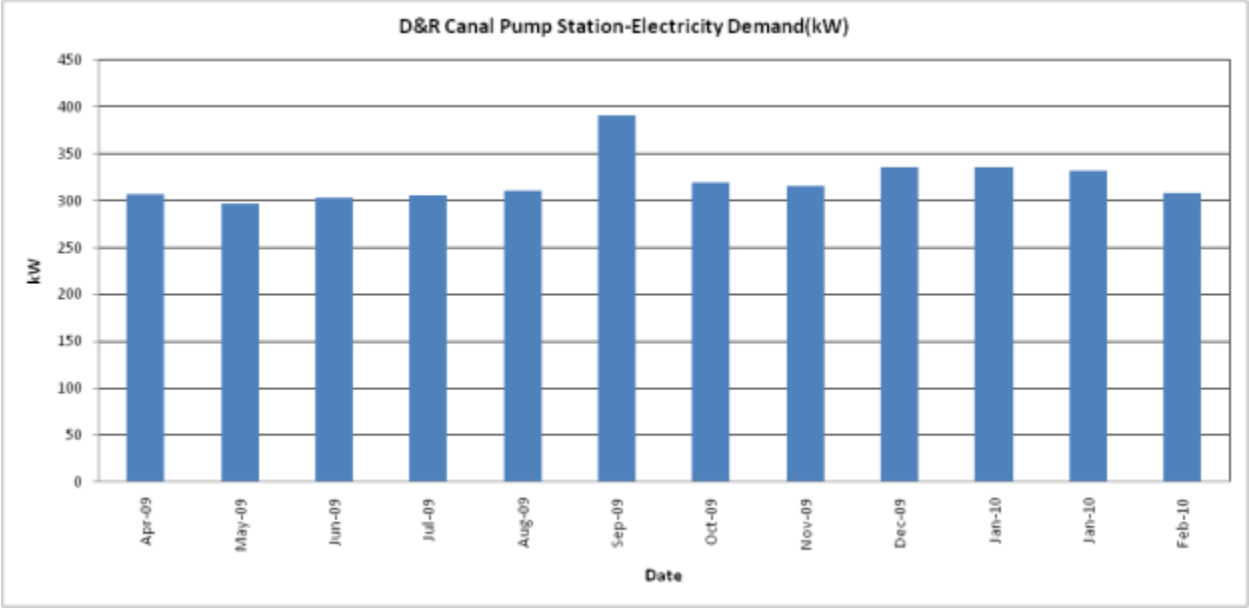
6.6. Wind

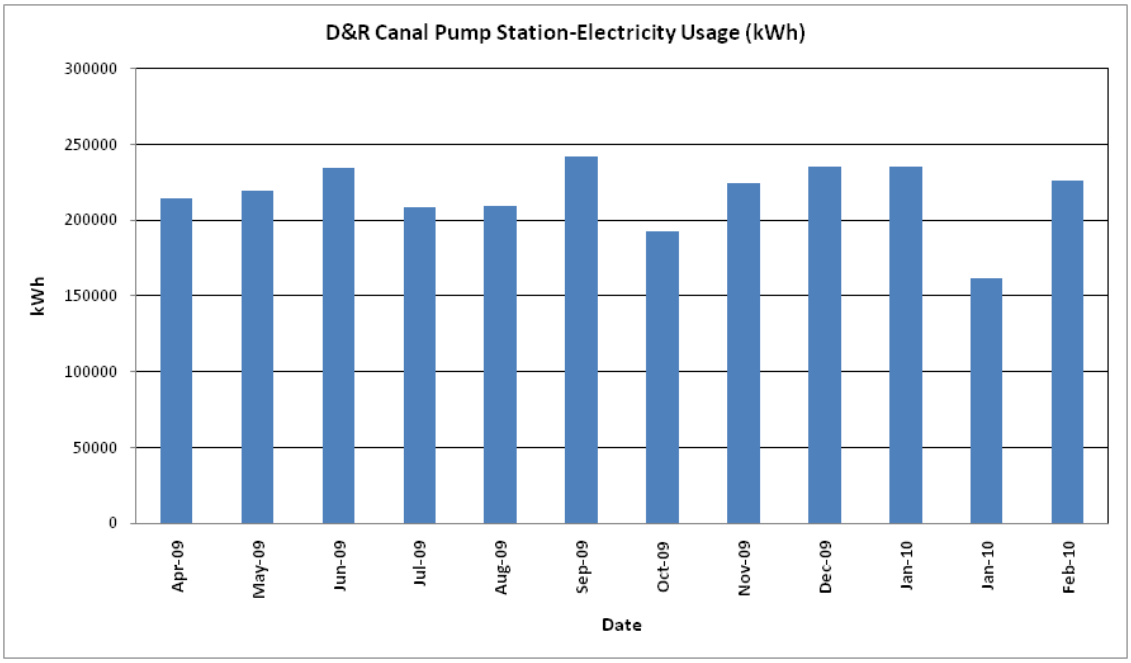
Wind power production is not appropriate for this location because required land is not available for the wind turbine. Also, the available wind energy resource is very low.

7. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

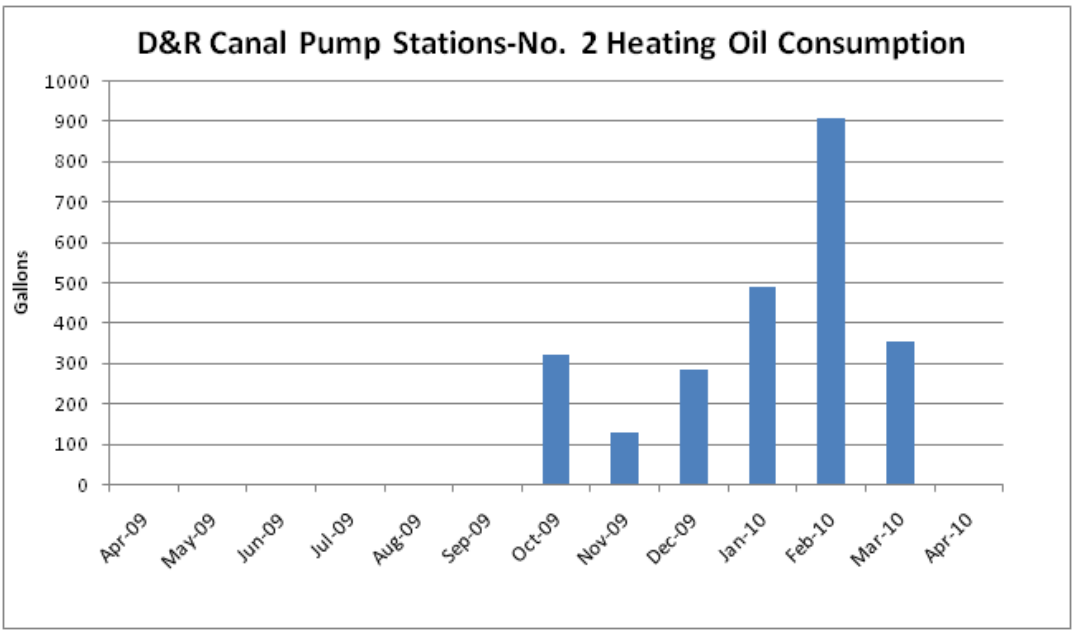
7.1. Energy Purchasing

The average electrical peak demand for the previous year was 321.8 kW and the maximum peak demand was 391 kW. The electric and gas load profiles for this project are presented in the following charts. The first chart shows electric demand (in kW) for the previous 12 months and the other two charts show electric and gas usage (in kWh), respectively.





The electrical demand peaks (except for a few fluctuations) reflect the electrical consumption peaks.

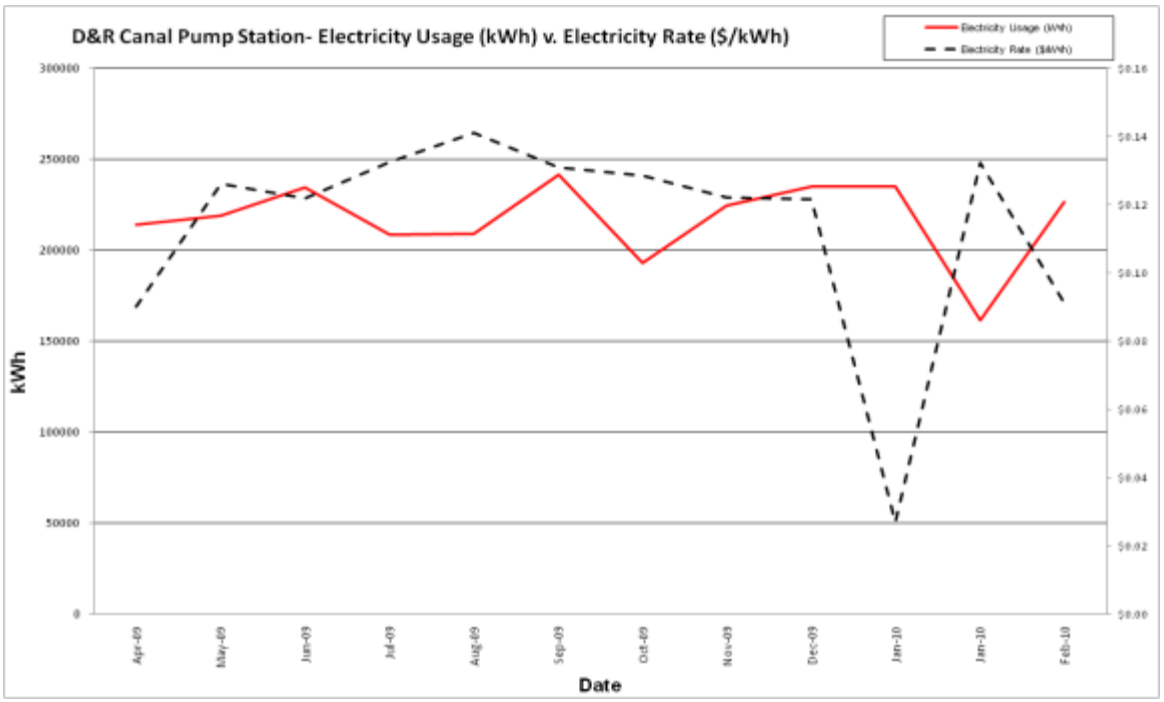


The No. 2 heating oil usage shows that the most heating oil is consumed in the winter months, meaning the primary use of heating oil in this building is for heating.

7.2. Tariff analysis

The D & R Canal Pump Station is direct-metered (via one meter) and currently purchases electricity transmission from Public Service Electric & Gas at a general service rate and electricity supply from Direct Energy. The general service rate for electric charges are market-rate based on use and the D & R Canal Pump Station billing does show a breakdown of demand costs. Demand prices are reflected in the utility bills and can be verified by observing the price fluctuations throughout the year. Typically, the electricity prices increase during the cooling months when electricity is used by the HVAC condensing units and air handlers.

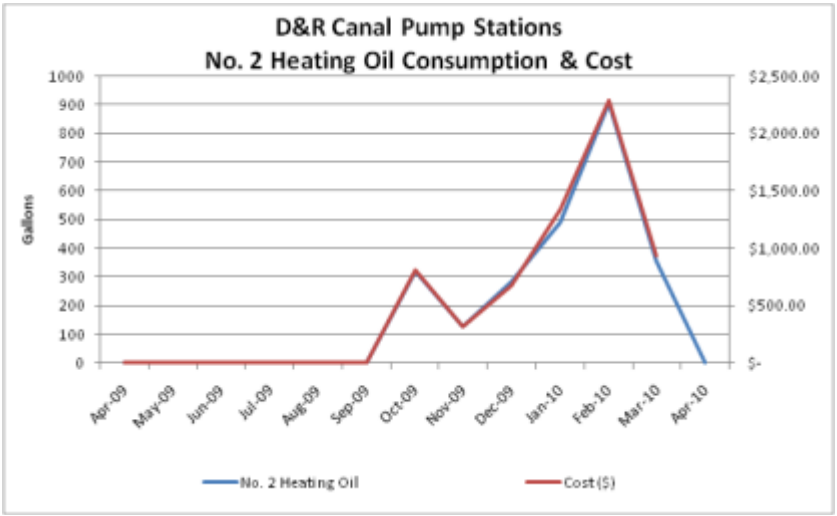
The following chart compares the utility consumption and utility rates for electricity over the previous 12 month period.



7.3. Energy Procurement strategies

Billing analysis shows an elevated cost for heating the pump station. Oil is purchased at a cost of $2.54 per gallon, equivalent to $1.81 per therm. By comparison, other buildings in New Brunswick purchase gas for about $1.25 per therm. Converting to natural gas from Public Service Electric & Gas would reduce the cost for heating the D&R Canal Pump Station by approximately $2,035/yr. Contacting third party suppliers of natural gas could further reduce the cost associated with energy procurement. Contact the NJ Energy Choice Program for further information on Energy Services Companies (ESCOs) that can act as third party energy suppliers. Appendix B contains a complete list of third party energy suppliers.

New Brunswick Water Utility currently purchases electricity supply from a third party supplier at a rate that is below the state average.



8. METHOD OF ANALYSIS

8.1. Assumptions and methods

Energy modeling method:	Spreadsheet-based calculation methods
Cost estimates:	RS Means 2009 (Facilities Maintenance & Repair Cost Data) RS Means 2009 (Building Construction Cost Data) RS Means 2009 (Mechanical Cost Data) Note: Cost estimates also based on utility bill analysis and prior experience with similar projects.

8.2. Disclaimer

This engineering audit was prepared using the most current and accurate fuel consumption data available for the site. The estimates that it projects are intended to help guide the owner toward best energy choices. The costs and savings are subject to fluctuations in weather, variations in quality of maintenance, changes in prices of fuel, materials, and labor, and other factors. Although we cannot guarantee savings or costs, we suggest that you use this report for economic analysis of the building and as a means to estimate future cash flow.

THE RECOMMENDATIONS PRESENTED IN THIS REPORT ARE BASED ON THE RESULTS OF ANALYSIS, INSPECTION, AND PERFORMANCE TESTING OF A SAMPLE OF COMPONENTS OF THE BUILDING SITE. ALTHOUGH CODE-RELATED ISSUES MAY BE NOTED, SWA STAFF HAVE NOT COMPLETED A COMPREHENSIVE EVALUATION FOR CODE-COMPLIANCE OR HEALTH AND SAFETY ISSUES. THE OWNER(S) AND MANAGER(S) OF THE BUILDING(S) CONTAINED IN THIS REPORT ARE REMINDED THAT ANY IMPROVEMENTS SUGGESTED IN THIS SCOPE OF WORK MUST BE PERFORMED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS THAT APPLY TO SAID WORK. PARTICULAR ATTENTION MUST BE PAID TO ANY WORK WHICH INVOLVES HEATING AND AIR MOVEMENT SYSTEMS, AND ANY WORK WHICH WILL INVOLVE THE DISTURBANCE OF PRODUCTS CONTAINING MOLD, ASBESTOS, OR LEAD.

LIGHTING ANALYSIS

New Brunswick
D&R Canal Pump Station
George Street

BIRDSALL SERVICES GROUP
ENGINEERS & CONSULTANTS

Upgrade Code	Upgrade Description	Existing		Proposed		Lighting		
		Fixture	Watts	Fixture	Watts	Total # of Upgrades	Cost per Upgrade ($)	SmartStart Rebate per Upgrade
1	Replace the 75W Halogen Lamps with 15W Compact Fluorescents	75W HALOGEN	75	15W CF/SI	15	1	$6.00	$0.00
2	Replace the 75W Incandescent Lamps with 15W Compact Fluorescents	75W INCANDESCENT	75	15W CF/SI	15	2	$6.00	$0.00
3	Replace the 60W Incandescent Lamps with 13W Compact Fluorescents	60W INCANDESCENT	60	13W CF/SI	15	2	$6.00	$0.00
4	Retrofit the 4' fixture by replaceing the (3) T12 Lamps and Magnetic Ballast(s) with (3) T8 Lamps and an Electronic Ballast	3L4' STD/STD	151	3L4' T8/ELEC	89	15	$70.00	$15.00
5	Retrofit the 8' fixture by replaceing the (4) T12 Lamps and Magnetic Ballast(s) with (4) T8 Lamps and an Electronic Ballast	4L8' EE/STD	276	4L8' T8/ELEC	233	2	$100.00	$15.00
6	Retrofit the 6' fixture by replaceing the (2) T12 Lamps and Magnetic Ballast(s) with (2) T8 Lamps and an Electronic Ballast	2L6' T12/STD/STD	158	2L6' T8/ELEC	108	2	$80.00	$15.00
7						0	$0.00	$0.00
8						0	$0.00	$0.00
9						0	$0.00	$0.00
10						0	$0.00	$0.00
11						0	$0.00	$0.00
12						0	$0.00	$0.00

Summary

	Lighting (Only)	Sensors (Only)	Complete Lighting Upgrade
Cost	$1,440.00	$0.00	$1,440.00
Rebate	$285.00	$0.00	$285.00
Net Cost	$1,155.00	$0.00	**$1,155.00**
Savings (kWh)	180	0	**180**
Savings ($)	$19.82	$0.00	**$19.82**
Payback	58.3		**58.3**

Variables:

$0.11	Avg. Electric Rate ($/kWh)
	Avg. Demand Rate ($/kW)
2080	Operating Hours/Year
8	Operating Hours/Work Day

Assumptions:

25%	Occupancy Sensor Savings (Avg)
40%	Occupancy Sensor Savings(>Avg)

Notes:

Seq. #	Upgrade Code	Room/Area	Hrs/ Work Day	Hrs/ Year	Existing				Proposed			kW Reduction	Lighting				Controls		Occupancy Sensors (ONLY)				SmartStart Rebate		Lighting & Occupancy Sensors			
					Fixture	Qty.	Watts	Foot Candles	Fixture	Qty.	Watts		Energy Savings, kWh	Cost ($)	Savings ($)	Payback (yrs)	Type	Qty.	Energy Savings, kWh	Cost ($)	Savings ($)	Payback (yrs)	Lighting	Sensors	Energy Savings, kWh	Post-Rebate Cost ($)	Savings ($)	Payback (yrs)
		Totals:					3478				2092	1.386	180	$1,440.00	$19.82	72.7			0	$0.00	$0.00		$285.00	$0.00	180	$1,155.00	$19.82	58.3
1	1	Potassium Permanganate	0.5	130	75W HALOGEN	1	75		15W CF/SI	1	15	0.06	8	$6.00	$0.86	7.0			0	$0.00	$0.00		$0.00	$0.00	8	$6.00	$0.86	7.0
2	3	Bathroom	0.5	130	60W INCANDESC	1	60		13W CF/SI	1	15	0.045	6	$6.00	$0.64	9.3			0	$0.00	$0.00		$0.00	$0.00	6	$6.00	$0.64	9.3
3	3	Boiler Room	0.5	130	60W INCANDESC	1	60		13W CF/SI	1	15	0.045	6	$6.00	$0.64	9.3			0	$0.00	$0.00		$0.00	$0.00	6	$6.00	$0.64	9.3
4	4	Pup Room	0.5	130	3L4' STD/STD	3	453		3L4' T8/ELEC	3	267	0.186	24	$210.00	$2.66	79.0			0	$0.00	$0.00		$45.00	$0.00	24	$165.00	$2.66	62.0
5	5		0.5	130	4L8' EE/STD	2	552		4L8' T8/ELEC	2	466	0.086	11	$200.00	$1.23	162.6			0	$0.00	$0.00		$30.00	$0.00	11	$170.00	$1.23	138.2
6	2		0.5	130	75W INCANDESC	2	150		15W CF/SI	2	30	0.12	16	$12.00	$1.72	7.0			0	$0.00	$0.00		$0.00	$0.00	16	$12.00	$1.72	7.0
7	4	Control Room	0.5	130	3L4' STD/STD	12	1812		3L4' T8/ELEC	12	1068	0.744	97	$840.00	$10.64	79.0			0	$0.00	$0.00		$180.00	$0.00	97	$660.00	$10.64	62.0
8	6	Office	0.5	130	2L6' T12/STD/STD	2	316		2L6' T8/ELEC	2	216	0.1	13	$160.00	$1.43	111.9			0	$0.00	$0.00		$30.00	$0.00	13	$130.00	$1.43	90.9

Appendix B: Third Party Energy Suppliers (ESCOs)

PSE&G SERVICE TERRITORY
Last Updated: 05/19/10

***CUSTOMER CLASS** - R – RESIDENTIAL C – COMMERCIAL I –INDUSTRIAL
****GREEN POWER MARKETER**

Supplier	Telephone & Web Site	*Customer Class
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com	C ACTIVE
Commerce Energy, Inc. 4400 Route 9 South, Suite 100 Freehold, NJ 07728	(800) 556-8457 www.commerceenergy.com	C ACTIVE
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway 38 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com	C ACTIVE
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 www.newenergy.com	C/I ACTIVE
Credit Suisse, (USA) Inc. 700 College Road East Princeton, NJ 08450	(212) 538-3124 www.creditsuisse.com	C ACTIVE
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com	C/I ACTIVE
FirstEnergy Solutions 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 www.fes.com	C/I ACTIVE
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, N.J. 08701	(800) 805-8586 www.gesc.com	R/C/I ACTIVE
Green Mountain Energy Company*** 3000 Atrium Way	(800) 810-7300	R/C/I

Mount Laurel, NJ 08054	www.greenmountain.com	**ACTIVE**
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	**C/I** **ACTIVE**
Integrys Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrysenergy.com	**C/I** **ACTIVE**
Liberty Power Delaware, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866) 769-3799 www.libertypowercorp.com	**C/I** **ACTIVE**
Liberty Power Holdings, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866) 769-3799 www.libertypowercorp.com	**C/I** **ACTIVE**
Linde Energy Services 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.linde.com	**C/I** **ACTIVE**
Palmco Power NJ, LLC One Greentree Centre 10000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	**C/I** **ACTIVE**
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) ENERGY-9 (363-7499) www.pepco-services.com	**C/I** **ACTIVE**
Sempra Energy Solutions The Mac-Cali Building 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.semprasolutions.com	**C/I** **ACTIVE**
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.south jerseyenergy.com	**C/I** **ACTIVE**

Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com	**C/I** **ACTIVE**
Sterling Planet, Inc.*** 58 Otto Avenue Beverly, NJ 08010	(877) 457-2306 www.sterlingplanet.com	**R/C/I** **ACTIVE**
Strategic Energy, LLC 55 Madison Avenue, Suite 400 Morristown, NJ 07960	(888) 925-9115 www.sel.com	**C/I** **ACTIVE**
Suez Energy Resources NA, Inc. 333 Thornall Street, 6th Floor Edison, NJ 08837	(888) 644-1014 www.suezenergyresources.com	**C/I** **ACTIVE**
UGI Energy Services, Inc. 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 50 East Palisades Avenue Englewood, NJ 07631	(800) 388-3862 www.lowcostpower.com	**R/C/I** **ACTIVE**
Viridian Energy 2001 Route 46, Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	**R/C/I** **ACTIVE**

Back to the main supplier page

New Jersey Clean Energy Pay for Performance

The NJ Clean Energy Pay for Performance (P4P) Program relies on a network of Partners who provide technical services to clients. LGEA participating clients who are not receiving Direct Energy Efficiency and Conservation Block Grants are eligible for P4P. SWA is an eligible Partner and can develop an Energy Reduction Plan for each project with a whole-building traditional energy audit, a financial plan for funding the energy measures and an installation construction schedule.

The Energy Reduction Plan must define a comprehensive package of measures capable of reducing a building's energy consumption by 15+%. P4P incentives are awarded upon the satisfactory completion of three program milestones: submittal of an Energy Reduction Plan prepared by an approved Program Partner, installation of the recommended measures and completion of a Post-Construction Benchmarking Report. The incentives for electricity and natural gas savings will be paid based on actual savings, provided that the minimum 15%performance threshold savings has been achieved.

For further information, please see: http://www.njcleanenergy.com/commercial-industrial/programs/pay-performance/existing-buildings .

Direct Install 2010 Program*

Direct Install is a division of the New Jersey Clean Energy Programs' Smart Start Buildings. It is a turn-key program for small to mid-sized facilities to aid in upgrading equipment to more efficient types. It is designed to cut overall energy costs by upgrading lighting, HVAC and other equipment with energy efficient alternatives. The program pays **up to 60%** of the retrofit costs, including equipment cost and installation costs.

Eligibility:

- Existing small and mid-sized commercial and industrial facilities with peak electrical demand **below 200 kW** within 12 months of applying
- Must be located in New Jersey
- Must be served by one of the state's public, regulated or natural gas companies
    - Electric: Atlantic City Electric, Jersey Central Power & Light, Orange Rockland Electric, PSE&G
    - Natural Gas: Elizabethtown Gas, New Jersey Natural Gas, PSE&G, South Jersey Gas

For the most up to date information on contractors in New Jersey who participate in this program, go to: http://www.njcleanenergy.com/commercial-industrial/programs/direct-install

Smart Start

New Jersey's SmartStart Building Program is administered by New Jersey's Office of Clean Energy. The program also offers design support for larger projects and technical assistance for smaller projects. If your project specifications do not fit into anything defined by the program, there are even incentives available for custom projects.

There are a number of improvement options for commercial, industrial, institutional, government, and agricultural projects throughout New Jersey. Alternatives are designed to enhance quality while building in energy efficiency to save money. Project categories included in this program are New Construction and Additions, Renovations, Remodeling and

Equipment Replacement.

For the most up to date information on how to participate in this program, go to: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings.

Renewable Energy Incentive Program*

The Renewable Energy Incentive Program (REIP) provides incentives that reduce the upfront cost of installing renewable energy systems, including solar, wind, and sustainable biomass. Incentives vary depending upon technology, system size, and building type. Current incentive levels, participation information, and application forms can be found at the website listed below.

Solar Renewable Energy Credits (SRECs) represent all the clean energy benefits of electricity generated from a solar energy system. SRECs can be sold or traded separately from the power, providing owners a source of revenue to help offset the cost of installation. All solar project owners in New Jersey with electric distribution grid-connected systems are eligible to generate SRECs. Each time a system generates 1,000 kWh of electricity an SREC is earned and placed in the customer's account on the web-based SREC tracking system.

For the most up to date information on how to participate in this program, go to: http://www.njcleanenergy.com/renewable-energy/home/home.

Utility Sponsored Programs

Check with your local utility companies for further opportunities that may be available.

Energy Efficiency and Conservation Block Grant Rebate Program

The Energy Efficiency and Conservation Block Grant (EECBG) Rebate Program provides supplemental funding up to $20,000 for eligible New Jersey local government entities to lower the cost of installing energy conservation measures. Funding for the EECBG Rebate Program is provided through the American Recovery and Reinvestment Act (ARRA).

For the most up to date information on how to participate in this program, go to: http://njcleanenergy.com/EECBG

Other Federal and State Sponsored Programs

Other federal and state sponsored funding opportunities may be available, including BLOCK and R&D grant funding. For more information, please check http://www.dsireusa.org/.

*Subject to availability. Incentive program timelines might not be sufficient to meet the 25% in 12 months spending requirement outlined in the LGEA program.