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**Local Government Energy Program
Energy audit report**

For

***Police Headquarters/Health Department
Borough of Rutherford
Rutherford, NJ 07070***

Project Number: LGEA13



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INTRODUCTION

On May 20th, 2009, Steven Winter Associates, Inc. (SWA) performed an energy audit and assessment of the Rutherford Police Headquarters and Health Department located in Rutherford, 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 Rutherford Borough Hall Annex is an older building and currently houses the Police Department as well as the Health Department. The Rutherford Borough Hall Annex building contains one story with a basement used by the Police Department. The building has a total floor area of 12,488 square feet. Typical occupancy is approximately 20 persons.

Energy data and building information collected in the field were analyzed to determine the baseline energy performance of each building. Using spreadsheet-based calculation methods, SWA 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.

EXECUTIVE SUMMARY

This document contains the energy audit report for the Rutherford Borough Hall Annex located at 184 Park Ave., Rutherford, NJ 07070. The Borough Hall Annex is a single story building with a basement used by the Police Department. Based on the field visit performed by Steven Winter Associates (SWA) staff on May 20th, 2009 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.

In the most recent full year of data collected (February 2008 through February 2009), the Borough Hall Annex building consumed approximately 232,590 kWh or \$36,823 worth of electricity and 4,540 therms or \$6,429 worth of natural gas. The average aggregated cost of electricity was calculated to be \$0.15/kWh and the average aggregated cost of natural gas was calculated to be \$1.73/therm. With electricity and gas combined, the building consumed 1,248 MMBtus of energy at a total cost of \$43,251.

SWA benchmarked Rutherford Borough Hall Annex using the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The Portfolio Manager was not able to generate a benchmark score for this building since it is mixed use. The benchmark rating is based on the facility's source energy use, level of business activity, and geographical location. The Portfolio Manager is also capable of generating a site energy use intensity number using 2008 as a baseline year.

In order to compare commercial buildings equitably, the *Portfolio Manager* ratings convey the consumption of each type of energy in a single common unit. The EPA uses source energy to represent the total amount of raw fuel required to operate the building. The site energy use intensity for the Rutherford Borough Hall Annex building is 99.9 kBtu/sq.ft/year. After energy efficiency improvements are made, future utility bills can be added to the Portfolio Manager and the site energy use intensity for a different time period can be compared to the year 2008 baseline to track the changes in energy consumption associated with the energy improvements.

SWA recommends some measures that may not be cost-effective based on energy savings alone but should be considered as a part of a capital improvement plan or as part of a routine maintenance schedule. SWA recommends that all rooftop HVAC equipment is maintained as per manufacturer's recommendations. Equipment should be inspected on a regular basis by maintenance staff, especially HVAC equipment that has been recently serviced. SWA also recommends that the door weather-stripping is inspected at least once a year and replaced as failure occurs. SWA strongly encourages that low-flow features are always considered when buying new water appliances such as faucets, toilets and showerheads. Occupancy sensors are also recommended for areas such as bathrooms that do not have security concerns in the police department and other areas that do not have constant use but can benefit from having the fixtures shut off during periods of time.

SWA recommends a total of 2 Energy Conservation Measures (ECMs) for Rutherford Borough Hall Annex. The total investment cost for these ECMs is **\$44,917**. SWA estimates a first year savings of **\$7,405** with a simple payback of **6.1 years**. SWA also estimates that Rutherford Borough Hall Annex will be able to reduce their carbon footprint by **72,177 lbs of CO2 annually**. SWA estimates that if the entire scope of work is installed as a package then the building can save up to 22% total site energy usage.

There are various incentives that Rutherford Borough Hall Annex could apply for that could also help lower the cost of installing the ECMs. SWA recommends that the Borough of Rutherford applies for the NJ SmartStart program through the New Jersey Office of Clean Energy. This incentive can help provide technical assistance for the building in the implementation phase of any energy conservation project.

When pursuing incentives through the SmartStart program, SWA encourages building managers to contact the program provider to obtain more detailed information on the program guidelines and request pre-approval for all planned upgrades. At the time of this report, incentives for lighting vary but replacing T12 lighting with T8

lighting would be eligible for an incentive up to \$30 per fixture and LED exit signs would be eligible for up to \$20 per fixture.

For further information on both custom and prescriptive incentives, please visit:

<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/equipment-incentives/equi>

Since the savings for this project are estimated at over 20%, the Borough of Rutherford could enroll the building in the New Jersey Clean Energy Program's Pay-for-Performance program. The Pay-for-Performance program or "P4P" is a program set-up to create financial incentives for buildings to do a detailed building audit and also implement measures that were studied as part of the energy audit. The P4P program currently accepts LGEA participants that are not currently also receiving incentives as part of the Federal block grant program. However, the costs associated with fulfilling the requirements of the P4P program, such as the installation of monitoring equipment or performing a calibrated modeling would make this financing option cost prohibitive for a building of this size,

The New Jersey Clean Energy website also provides information on an upcoming Direct-Install program that would be applicable to this project. The Direct-Install program is aimed at commercial buildings with an average annual demand of less than 200kW. This program is designed to offset up to 80% of the cost of replacing equipment nearing the end of its useful lifecycle with high efficiency alternatives. This program could help offset the cost of replacing the entire heating system. This program has not officially been released but can be followed online at:

<http://www.njcleanenergy.com/commercial-industrial/programs/programs>

The following table summarizes the proposed Energy Conservation Measures (ECM) and their economical relevance.

SCOPE OF WORK – SUMMARY TABLE

ECM Table without Incentives															
ECM #	ECM description	Installed Cost		1st year energy and cost savings							Simple Payback (SPP)	Life of Measure (LoM)	Lifetime Cost Savings (\$)	Return on Invest (ROI)	Annual Carbon Reduction (lbs of CO2)
		Estimated Cost (\$)	Source	Electric Savings			Fuel Savings		Cost Savings (\$)						
				Consumption	Demand	Natural Gas									
1	Upgrade existing lighting	\$ 34,980	RS Means	28,987	kWh	3	kW	0	Therms	\$ 4,348	8.0	20	\$ 63,508	4.1%	51,901
2	Airseal and install R-19 insulation in plenum	\$ 9,937	RS Means	880	kWh	0	kW	1,691	Therms	\$ 3,057	3.3	15	\$ 35,977	17.5%	20,216
Total Scope of Work		\$ 44,917	-	-	-	3.0	-			\$ 7,405	6.1		\$ 99,485		72,117
Definitions:		Assumptions:													
SPP: Simple Payback (years)				Discount rate =	3.2%	per DOE FEMP guidelines				Average Electric Rate =		0.15	\$/kWh		
LoM: Life of Measure (years)				Energy price escalation rate =	0%	per DOE FEMP guidelines				Average Fuel Rate =		1.73	\$/Therm		
ROI: Return on Investment (%)															
				Carbon Dioxide per unit Electricity =	1.7905	lbs of CO2/kWh									
				Carbon Dioxide per unit of Fuel =	11.023	lbs of CO2/unit fuel									

1. HISTORIC ENERGY CONSUMPTION

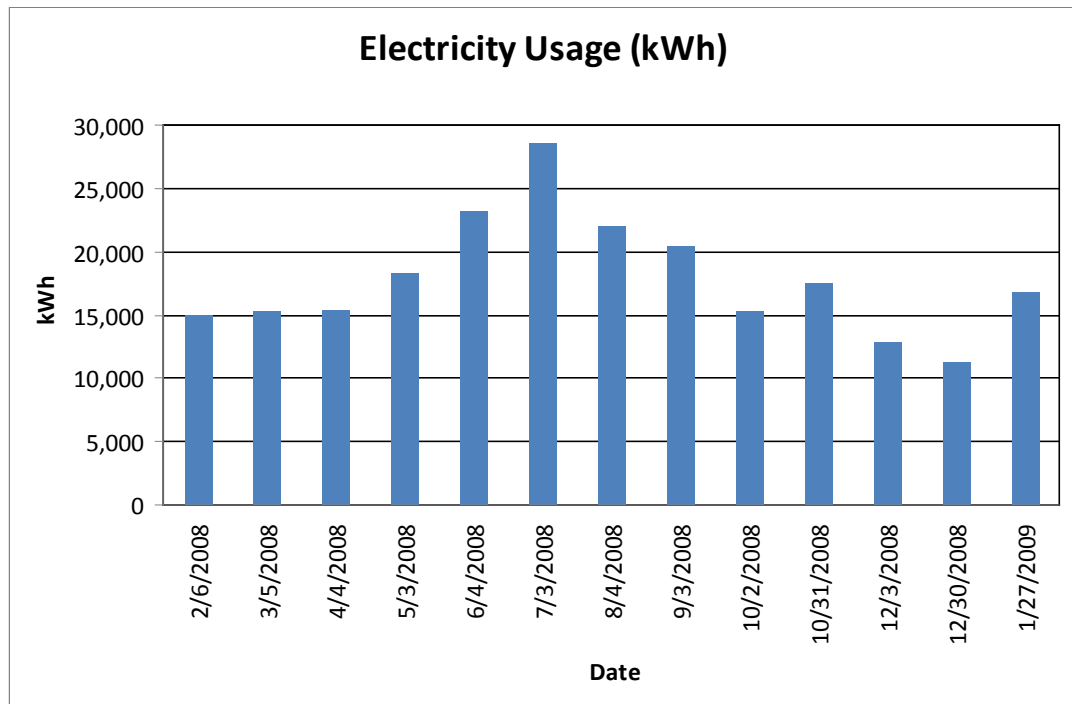
1.1. Energy usage and cost analysis

SWA received and analyzed utility bills from February 2007 through February 2009 that were received from the Borough of Rutherford.

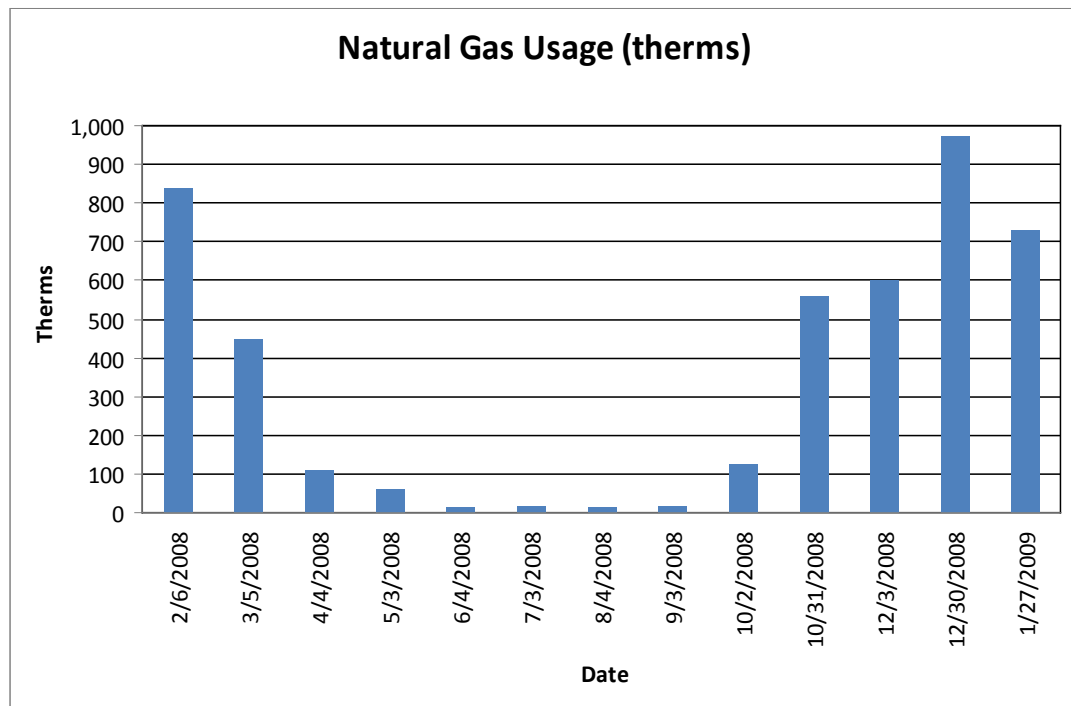
Electricity – The Rutherford Borough Hall Annex has one electric meter for incoming electricity supply. The building purchases electricity from PSEG at **an average aggregated rate of \$0.15/kWh** based on February 2008 through February 2009 electric bills. The building purchased **approximately 232,590 kWh or \$36,823 worth of electricity from February 2008 through February 2009**. Based on the same time period, the building also has **an average monthly demand of 47.7 kW and monthly peak demand of 73.2 kW**.

Natural Gas – The Rutherford Borough Hall has one gas meter for incoming natural gas from PSE&G. Between February 2008 and February 2009, the building purchased **approximately 4,540 therms or \$6,429 worth of natural gas**. The average aggregated cost of natural gas was calculated to be **\$1.73 per therm**.

The following chart shows electricity usage for the Borough Hall Annex Building based on utility bills for the 2008- 2009 billing period.



The following chart shows the natural gas usage for the Borough Hall Annex Building based on utility bills for the year February 2008 to February 2009.



In the above chart, the natural gas usage follows a heating trend as expected. During the summer it is clear that the natural gas usage is very minimal which reflects that heat is not being used and the DHW load is minimal.

1.2. Utility rate

Rutherford Borough Hall Annex currently buys electricity and gas from PSEG at the GSGH MD general service rate. The GSGH MD general service rate is a typical rate where customers pay for natural gas based on usage and electricity based on usage with the addition of an electrical charge demand. Rutherford Borough Hall Annex uses PSEG account #01 21 020 132 19 at the service address of 184 Park Ave, Rutherford, NJ. Electricity for the building was billed at an average rate of **\$0.15/kWh**. Natural Gas for the building was billed at an average rate of **\$1.73/therm**.

1.3. Energy benchmarking

The Rutherford Borough Hall Annex Building information and utility data were entered into the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. A performance score could not be generated since the building is mixed use. SWA recommends that the Rutherford Borough maintain the Portfolio Manager account at the link below. As the account is maintained, SWA can share the Rutherford Borough Hall building and allow future data to be added and tracked using the benchmarking tool.

http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager



STATEMENT OF ENERGY PERFORMANCE

Borough of Rutherford - Police Headquarters/Health Department

Building ID: 1800565
For 12-month Period Ending: January 31, 2009¹
Date SEP becomes ineligible: N/A

Date SEP Generated: August 19, 2009

Facility
Borough of Rutherford - Police
Headquarters/Health Department
184 Park Avenue
Rutherford, NJ 07070

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 2009
Gross Floor Area (ft²): 12,488

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Natural Gas (kBtu) ⁴	410,429
Electricity (kBtu)	757,079
Total Energy (kBtu)	1,167,508

Energy Intensity⁵

Site (kBtu/ft ² /yr)	93
Source (kBtu/ft ² /yr)	237

Emissions (based on site energy use)
Greenhouse Gas Emissions (MtCO₂e/year)

137

Electric Distribution Utility
PSE&G - Public Service Elec & Gas Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	11%
Building Type	Other

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.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional
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.

The government estimates the average time needed to fill out this form is 6 hours (includes the time for entering energy data, PE facility inspection, and notarizing the SEP) and welcomes suggestions for reducing this level of effort. Send comments (referencing OMB control number) to the Director, Collection Strategies Division, U.S., EPA (20221), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460.

EPA Form 5900-16

2. FACILITY AND SYSTEMS DESCRIPTION

2.1. Building Characteristics

Rutherford Borough Hall Annex is an older mixed-use building. The building is shared by the Rutherford Police Department and the Rutherford Department of Health. The building is one story with a basement used by the Police Department. The building has a total area of 12,488 square feet.

2.2. Building occupancy profiles

During the site visit, there were approximately 10-20 employees observed in the building at once. The Borough Hall Annex building is operated during the normal business hours of 8:30am to 4:30pm, with the exception of the Police Department which is operated 24 hours per day, 365 days per year.

2.3. Building envelope

2.3.1. Exterior walls

The Borough Hall Annex building consists of a 4" face brick façade in front of CMU masonry block construction. The walls are furred out using metal studs spaced 16" on center on the interior side. No insulation was detected during the energy audit. While insulation could be added to the exterior walls of the main building, it would have a significant impact on building operations but would not be cost-effective. If any portion of the building is renovated or improved as part of a capital improvement plan, SWA recommends increased insulation is added to any walls during construction.

2.3.2. Roof

The flat roof of the building consists of light gray built-up roofing. The roof surface appeared to be in fair-good condition and it would not be cost effective to upgrade at this point in time. The roof has an unusually large plenum. The ceilings for the building are 9' ceilings but there is an 8' plenum located directly above the ceiling, then a cement floor and then another 3' plenum. No part of the ceiling or plenum is insulated, thus allowing a large volume of air to be heated by the building unnecessarily. SWA recommends increasing the amount of insulation located in the attic as well as airseal any leaky attic space to keep more conditioned air inside of the actual conditioned spaces and allow the least amount of expensive, conditioned air to escape.

2.3.3. Base

The building contains a masonry basement that is used by the Police Department. The floor of the basement is 4" concrete slab-below-grade. There were no reported problems with water penetration or moisture.

2.3.4. Windows

All of the windows in the building appear to be original to the building and contain single-pane glass. The windows appeared to be in fair condition and did not allow for excessive air or moisture penetration around the frame. There are no cost-effective measures for the windows at this point in time. Due to the single-pane glass and age of the windows, the windows do not have a good insulating value. At this time, replacing the windows would not be cost-effective but SWA recommends that windows are replaced with newer windows with a high insulating value if any capital improvements or construction are planned for the building in the future.

2.3.5. Exterior doors

The entrance ways for the Rutherford Municipal Annex Building consists of glass doors set in a metal frame. The frames of these doors are poor insulators and allow expensive, conditioned air to leak out of the building. Many of the doors were observed to be having deteriorated weather-stripping so that they did not seal well to the frames. SWA recommends weather-stripping around all of the doors of the building in order to prevent conditioned air from leaking outside of the building. Weather-stripping should be checked at least once a year and replaced as soon as signs of deterioration show.

2.3.6. Building air tightness

The Rutherford Municipal Annex Building was relatively tight with the exception of the exterior doors and some small penetrations inside of the building. Entranceways such as the glass vestibule on the Park Ave. side of the Health Department and the Donaldson Ave side of the Police Department should be checked annually for weather-stripping. These doors should always form a tight seal to prevent air leakage through the building shell.

2.4. HVAC systems

2.4.1. Heating

The Rutherford Borough Hall Annex Building contains five (5) Carrier roof top units that provide both gas heat and DX cooling. These rooftop units are separated since the operational hours of the building differ by department; four of the rooftop units are dedicated to the Police Department while the fifth unit is dedicated to the Health Department. The Police Department is broken into 4 zones, with a packaged unit for each zone. The four zones are Captain's Office, Detective's Bureau, Offices and Entrance Area. Each unit in the building has a thermal efficiency of 80% and the total building capacity for all five of the units is 1,060 kBTU/310.7 kW. The distribution system for the HVAC equipment is ducted. According to building staff, the units have been serviced recently. The units would not be cost-effective to upgrade at this time.

2.4.2. Cooling

The Borough Hall Annex uses the same rooftop units for heating and cooling. While natural gas provides the heating element for the rooftop units, electric DX coils with R22 refrigerant provides cooling.

2.4.3. Ventilation

The rooftop units for the Borough Hall Annex Building condition fresh outside air and introduce it via ducts throughout the entire building. The rooftop units provide fresh air, while stale air is exhausted through fans located in the bathrooms. Rooftop exhaust fans help remove stale air as well as induce fresh air into the building. The windows in the building are also operable and can be used for natural ventilation.

2.4.4. Domestic Hot Water

The building contains one Rheem gas-fired domestic hot water heater with a capacity of 40 MBTU/hr and a total storage of 50 gallons. SWA estimates that there is approximately 30% of useful life left in the equipment.

It is not cost-effective to replace the existing water heating equipment with higher efficiency equipment. However, higher efficiency water heating equipment will save energy and should be strongly considered upon replacement of the equipment. Energy saving appliances bearing the ENERGY STAR label should be selected to ensure efficiency performance. Incentives may be available to offset any added costs for the installed equipment.

More efficient water-consuming fixtures and appliances save both energy and money through reduced energy consumption for water heating, as well decreased water and sewer bills. SWA recommends that the aerators in all sinks are retrofitted with low-flow aerators that constrict the volume of water allowed to flow out of the faucets during the time it takes to wash hands, wash dishes, etc. Building staff can also easily install faucet aerators and/or low-flow fixtures to reduce hot water consumption. In addition, routine maintenance practices that identify and quickly address water leaks are a low-cost way to save water and energy.

2.5. Electrical systems

2.5.1. Lighting

Interior Lighting – All of the lighting in the Borough Hall Annex is inefficient including general area lighting and exit signs. The lighting consists of T12 fluorescent fixtures with magnetic ballasts that consume excessive amounts of electricity. Also, the building contains fluorescent exit signs that consume excessive energy 24 hours per day. There are approximately 179 fixtures throughout the building that contain T12 fluorescent bulbs with magnetic ballasts that should be replaced with T8 fluorescent bulbs with electronic ballasts. There were approximately 18 incandescent lights found in the building. CFL bulbs save money since they require less power to operate and they also have a better light quality. The building also contained 7 fluorescent exit signs. LED exit signs are always cost-effective since they use such little power and operate 24 hours a day, 365 days a year. See attached existing and proposed lighting schedule in Appendix A.

2.5.2. Appliances and process

Appliances, such as refrigerators, copiers and computers that are over 10 years of age should be replaced with newer efficient models with the Energy Star label. For example, Energy Star refrigerators use as little as 315kwh/hr. When compared to the average electrical consumption of older equipment, Energy Star equipment results in a large savings. Look for the Energy Star label when replacing appliances and equipment, including: window air conditioners, refrigerators, printers, computers, copy machines, etc. More information can be found in the “Products” section of the Energy Star website at: <http://www.energystar.gov>

2.5.3. Elevators

There are no elevators at the Rutherford Borough Hall Annex building.

2.5.4. Other electrical systems

There are currently no other electrical systems in the building.

3. EQUIPMENT LIST

Building System	Description	Make/ Model	Fuel	Space served	Estimated Remaining useful life %
Heating/Cooling	RTU-1; Carrier Forced air furnace with cooling unit. 225,000 btuh/66.0 kW output. Thermal efficiency of 80%. R22	Carrier Series EB, Model #48LJE012510	Natural Gas/Electric	Captain's Office	30%
Heating/Cooling	RTU-2; Carrier Forced air furnace with cooling unit. 180,000 btuh/52.8kW output. Thermal efficiency of 80%. R22	Carrier Series EB, Weathermaker I, Model #48LJE008510	Natural Gas/Electric	Detective's Bureau	30%
Heating/Cooling	RTU-3; Carrier Forced air furnace with cooling unit. 180,000 btuh/52.8 kW output. Thermal efficiency of 80%. R22	Carrier Series EB, Weathermaker I, Model #48LJE008510	Natural Gas/Electric	Offices	30%
Heating/Cooling	RTU-4; Carrier Forced air furnace with cooling unit. 115,000 Btuh/33.7 kW output. Thermal efficiency of 80%. R22	Carrier Series CA, Weathermaker I, Model #48LJE007530	Natural Gas/Electric	Entrance Area/First floor front	30%
Heating/Cooling	RTU-5; Carrier Forced air furnace with cooling unit. 360,000 btuh/105.4 kW output. Thermal efficiency of 80%. R22. Installed in 2008. 12.5-15 ton. 10 hours per day, 5 days per week. 9.5 EER.	Carrier, Model #48TMF016G--S11A	Natural Gas/Electric	Health Department	96%
Ventilation	Five (5) Greenheck 1/4 HP exhaust fans	Greenheck, Model #CBE 10 4	Electric	1 Health/4 Police Department	30%
Ventilation	Two (2) Greenheck exhaust fans	Greenheck, Model #CE 7.5 DE	Electric	Police Department	30%
Domestic Hot Water	One (1) Rheem Domestic hot water heater, 40,000 btuh input, 50 gallon storage	Rheem Guardian system, Fury gas water heater, Model #41V50-40F	Natural Gas	All Areas	30%
Lighting	See details appendix A	-	-	-	-

Note: The remaining useful life of a system (in %) is an estimate based on the system date of built and existing conditions derived from visual inspection.

4. ENERGY CONSERVATION MEASURES

Based on the assessment of this building, SWA has separated the investment opportunities into two categories of recommendations:

General Recommendations: Operations and Maintenance

- The Borough Hall Annex has recently had some of the mechanical HVAC system repaired or replaced. It is important that the efficient operation of this system is maintained in order to reduce operation and maintenance costs.
- Weather Stripping/Air Sealing - SWA observed that exterior door weather-stripping was beginning to deteriorate. Doors and vestibules should be observed annually for deficient weather-stripping and replaced as needed. The perimeter of all window frames should also be regularly inspected and any missing or deteriorated caulking should be re-caulked to provide an unbroken seal around the window frame. Any other accessible gaps or penetrations in the thermal envelope penetrations should also be sealed with caulk or spray foam.
- Water Efficient Fixtures & Controls - Adding controlled on/off timers on all lavatory faucets is a cost-effective way to reduce domestic hot water demand and save water. Building staff can also easily install faucet aerators and/or low-flow fixtures to reduce water consumption. There are many retrofit options, which can be installed now or incorporated as equipment is replaced. Routine maintenance practices that identify and quickly address water leaks are a low-cost way to save water and energy. Retrofitting with more efficient water-consuming fixtures and appliances will save both energy and money through reduced energy consumption for water heating, while also decreasing water and sewer bills.

Specified Recommendations: Energy Conservation Measures

Summary table

ECM#	Description
1	Upgrade Existing Lighting; See appendix A for entire lighting retrofit schedule.
2	Airseal and install R-19 insulation in plenum above main floor ceiling

ECM#1: Upgrade Existing Lighting

Description:

The Rutherford Borough Hall Annex building consists of outdated T12 fluorescent lighting with magnetic ballasts. SWA recommends that each T12 fixture is replaced with a T8 fixture with electronic ballasts. There are currently 179 fluorescent fixtures that need to be upgraded. Typically, T8 fluorescent lights with electronic ballasts have an electrical savings of 30% over T12 fixtures with magnetic ballasts. T8 fluorescent fixtures also have a better quality light output and can save on maintenance costs over T12 fixtures. There are currently 18 incandescent light bulbs that were found during the audit, these should be replaced with newer type CFL bulbs. The Borough Hall Annex building also has 7 fluorescent exit signs installed in the building that should be changed to LED exit signs. Exit signs are one good opportunity for energy efficiency since they are required to operate 24 hours per day. See Appendix A for complete existing and proposed lighting schedules.

Installation cost:

Estimated installed cost: \$34,980

Source of cost estimate: RS Means

Economics:

1st year energy and cost savings							Simple Payback (SPP)	Life of Meas. (LoM)	Lifetime Cost Savings	Return on Invest (ROI)
Electricity Savings			Fuel Savings		Cost Savings					
Consumption		Demand	Natural Gas							
28,987	kWh	3.0	kW	0	Therms	\$ 4,348	8.04	20	\$ 63,508	4.08%

Assumptions: SWA calculated the savings for this measure using measurements taken the day of the field visit, and billing analysis. It was assumed that replacing T12 fluorescent fixtures containing magnetic ballasts with T8 fluorescent fixtures containing electronic ballasts will save a maximum of 30% usage per fixture.

Rebates/financial incentives:

NJ Clean Energy – Prescriptive Lighting Incentive, Incentive based on installing T5 or T8 lamps with electronic ballasts in existing facilities (\$10-\$30 per fixture, depending on quantity of lamps). Maximum incentive amount is \$5,370.

NJ Clean Energy – Prescriptive Lighting Incentive, Incentive based on installing LED Exit signs (\$10/\$20 per fixture). Maximum incentive amount is \$140.

Options for funding ECM:

This project may benefit from enrolling in NJ Pay-for-Performance program or the NJ SmartStart program with Technical Assistance to offset a portion of the cost of implementation.

<http://www.njcleanenergy.com/commercial-industrial/home/home>

ECM#2: Airseal and install R-19 insulation in plenum above main floor ceiling

Description:

There is currently an unusually large plenum located above the entire main floor of the building. This plenum is divided into an 8' section and a 3' section. This large plenum is un-insulated and creates a large volume of air that is conditioned by the heating and cooling systems. SWA recommends that this area is air-sealed and then insulated with blown insulation with a minimum insulation of R-19. Air-sealing and insulating this space will reduce the load on the heating and cooling equipment. Insulation will provide a thermal barrier between the conditioned and unconditioned spaces, especially during the heating season.

Installation cost:

Estimated installed cost: \$9,937

Source of cost estimate: RS Means/Similar Project

Economics:

1st year energy and cost savings							Simple Payback (SPP)	Life of Measure (LoM)	Lifetime Cost Savings	Return on Invest (ROI)
Electricity Savings				Fuel Savings		Cost Savings				
Consumption		Demand		Natural Gas						
880	kWh	0	kW	1,691	Therms	\$ 3,057	3.25	15	\$ 35,977	17.47%

Assumptions: SWA calculated the savings for this measure using information collected during the field visit and analysis of historical utility consumption information. SWA assumes that the savings will occur during the heating and cooling seasons. SWA assumes calculations based on install R-19 insulation directly above the main floor ceiling.

Rebates/financial incentives:

There are currently no incentives for this measure.

Options for funding ECM:

This project may benefit from enrolling in NJ Pay-for-Performance program or the NJ SmartStart program with Technical Assistance to offset a portion of the cost of implementation.

<http://www.njcleanenergy.com/commercial-industrial/home/home>

5. RENEWABLE AND DISTRIBUTED ENERGY MEASURES

5.1. Existing systems

There are currently no existing renewable energy systems.

5.2. Solar Photovoltaic

Solar photovoltaic panels are not recommended for this building based on the limited roof space as well as the small amount of electric usage and demand for the building.

5.3. Solar Thermal Collectors

Solar thermal collectors are not cost effective for this project and are not recommended due to the low amount of domestic hot water use throughout the building.

5.4. Combined Heat and Power

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

5.5. Geothermal

Geothermal is not applicable to this project because it would require modifications to the existing heat distribution system, which would not be cost effective.

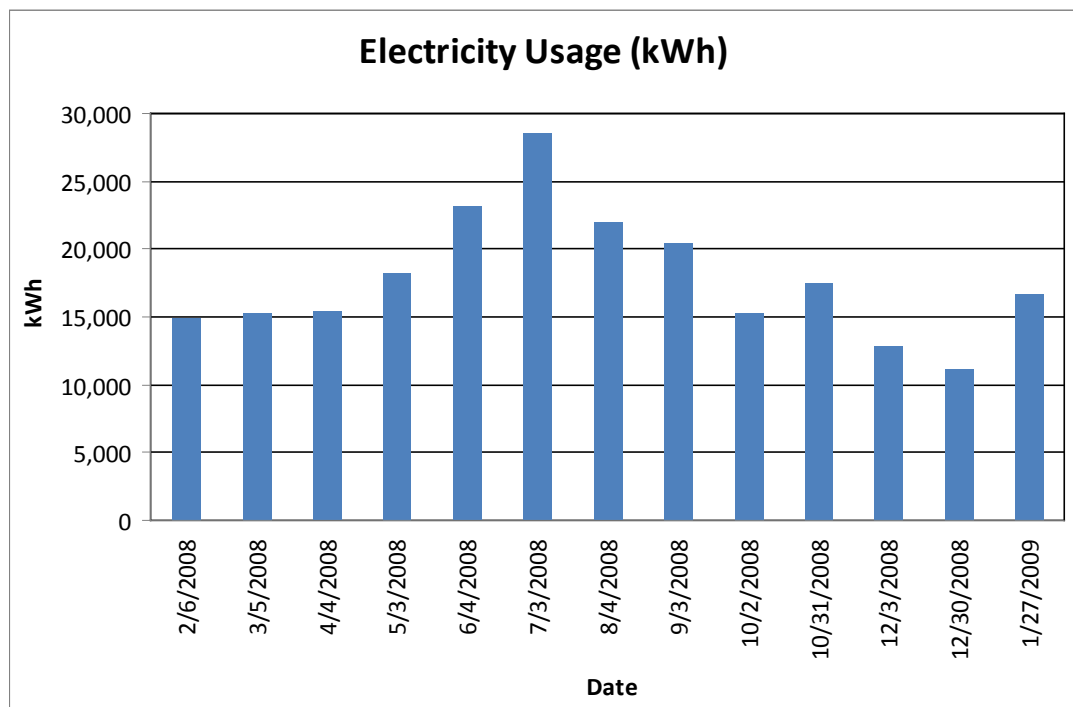
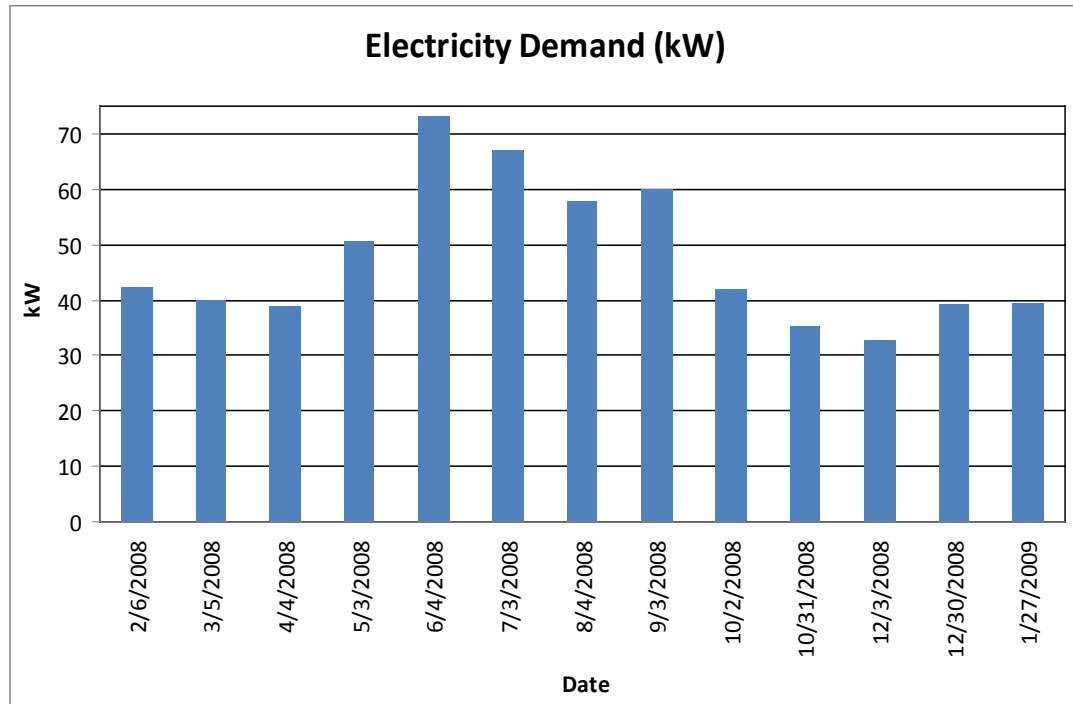
5.6. Wind

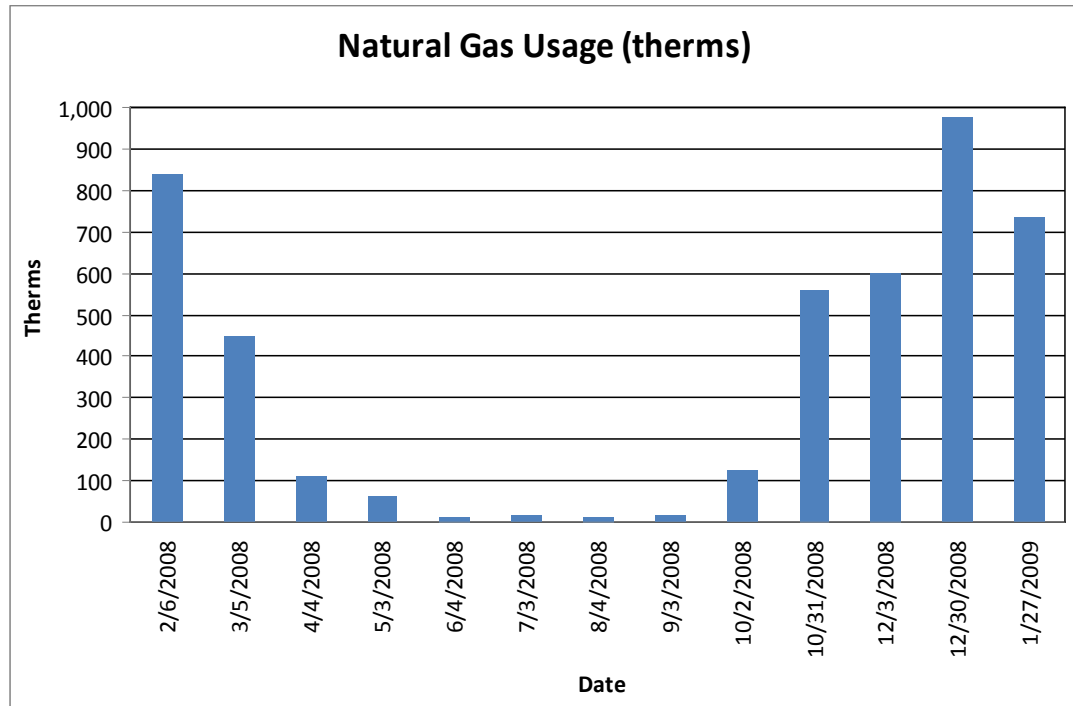
Wind power production is not appropriate for this location because required land is not available for the wind turbine. Also, the available wind energy resource is very low.

6. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

6.1. Load profiles

The average electrical peak demand for the previous year was 47.7 kW and the maximum peak demand was 73.2 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.



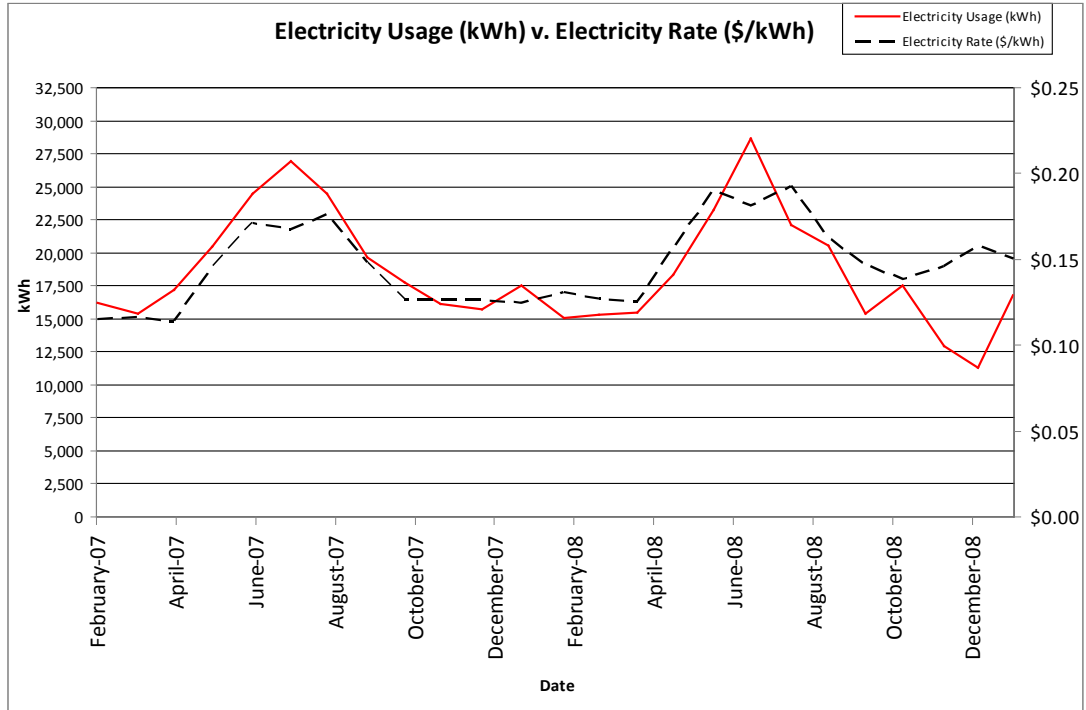


6.2. Tariff analysis

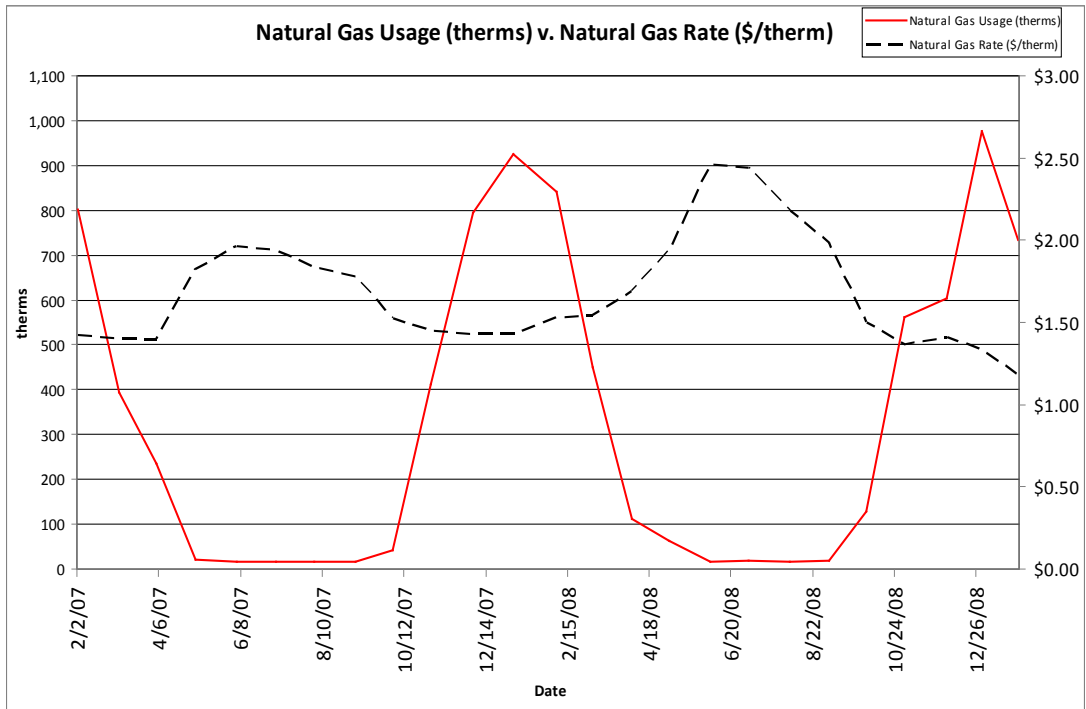
The Rutherford Borough Hall Annex currently buys electricity from PSEG at the general service rate, which charges customers based on the market rate of electricity usage as well as monthly peak demand. Gas is purchased from PSEG at the BGSS service rate which charges customers based on the market rate of natural gas usage. General Service rates are appropriate for this building due to its size.

6.3. Energy Procurement strategies

Billing analysis shows price fluctuations of over 20% over the course of the year for the building electrical and natural gas accounts. Customers that have a large variation in monthly billing rates can often reduce the costs associated with energy procurement by selecting a third party energy supplier. Contact the NJ Energy Choice Program for further information on Energy Services Companies (ESCOs) that can act as third party energy suppliers. Purchasing electricity from an ESCO can reduce electric rate fluctuation and ultimately reduce the annual cost of energy for the school. Appendix B contains a complete list of third party energy suppliers.



Electricity prices reflect electricity usage



Natural gas prices fluctuate as expected with usage

The building would not be eligible for enrollment in a Demand Response Program because the minimum electric demand each month does not greatly exceed 50 kW, which is the typical threshold for considering this option.

7. METHOD OF ANALYSIS

7.1. 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.

7.2. 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.

Appendix A: Lighting study

Existing Lighting Conditions																
#	Building	Level/Floor	Measured Lighting Level in Footcandles	Location in Building	Fixture Type	Ballast Type	No. of Fixtures	No. of Lamps	Type of Lamp	Watts/Lamp	Hrs/Day	Energy Use (Watt hours/day)	Annual Energy Use (kWh/year)	Controls	Daylighting possible?	Total Power (W)
1	Borough Hall Annex	First - PD	70	Front Vestibule	4' linear T12	magnetic	5	4	fluorescent	34	24	16320	4260	Switch	No	680
2	Borough Hall Annex	First - PD	5	Men's Room	40W Incandescent	-	1	1	incandescent	40	12	480	125	Switch	No	40
3	Borough Hall Annex	First - PD	5	Women's Room	40W Incandescent	-	1	1	incandescent	40	12	480	125	Switch	No	40
4	Borough Hall Annex	First - PD	30	Main Hall	4' linear T12	magnetic	5	4	fluorescent	34	24	16320	4260	Switch	No	680
5	Borough Hall Annex	First - PD	30	Main Hall	Fluorescent Exit Sign	-	2	1	fluorescent	14	24	672	175	None	No	28
6	Borough Hall Annex	First - PD	35	Dispatch	4' linear T12	magnetic	5	4	fluorescent	34	24	16320	4260	Switch	No	680
7	Borough Hall Annex	First - PD	30	Dispatch - Bath	2' U-shaped T12	magnetic	1	2	fluorescent	34	12	816	213	Switch	No	68
8	Borough Hall Annex	First - PD	51	Reporting Room	4' linear T12	magnetic	2	4	fluorescent	34	12	3264	852	Switch	No	272
9	Borough Hall Annex	First - PD	74	Criminal Investigation Division	4' linear T12	magnetic	10	4	fluorescent	34	12	16320	4260	Switch	No	1360
10	Borough Hall Annex	First - PD	35	Right Hallway	4' linear T12	magnetic	6	4	fluorescent	34	24	19584	5111	Switch	No	816
11	Borough Hall Annex	First - PD	35	Right Hallway	Fluorescent Exit Sign	-	1	1	fluorescent	34	24	816	213	Switch	No	34
12	Borough Hall Annex	First - PD	56	Detective's Borough	4' linear T12	magnetic	4	4	fluorescent	34	12	6528	1704	Switch	No	544
13	Borough Hall Annex	First - PD	78	Patrol Captain	4' linear T12	magnetic	4	4	fluorescent	34	12	6528	1704	Switch	No	544
14	Borough Hall Annex	First - PD	66	Traffic	4' linear T12	magnetic	2	4	fluorescent	34	12	3264	852	Switch	No	272
15	Borough Hall Annex	First - PD	106	Secretary's Office	4' linear T12	magnetic	6	4	fluorescent	34	12	9792	2556	Switch	No	816
16	Borough Hall Annex	First - PD	8	Custodian's Office	60W Inc.	-	1	1	incandescent	60	8	480	125	Switch	No	60
17	Borough Hall Annex	First - PD	48	Side Entrance	4' linear T12	magnetic	2	4	fluorescent	34	24	6528	1704	Switch	No	272
18	Borough Hall Annex	First - PD	31	Cell Hall	4' linear T12	magnetic	1	2	fluorescent	34	24	1632	426	Switch	No	68
19	Borough Hall Annex	First - PD	22	Photo ID Room	4' linear T12	magnetic	2	2	fluorescent	34	12	1632	426	Switch	No	136
20	Borough Hall Annex	First - PD	38	Holding Cells and Room (not used)	4' linear T12	magnetic	4	2	fluorescent	34	24	6528	1704	Switch	No	272
21	Borough Hall Annex	First - PD	86	DWI Room	4' linear T12	magnetic	1	4	fluorescent	34	12	1632	426	Switch	No	136
22	Borough Hall Annex	First - PD	41	Interview 1	4' linear T12	magnetic	1	4	fluorescent	34	12	1632	426	Switch	No	136
23	Borough Hall Annex	First - PD	8	Bath	60W Inc.	-	1	1	incandescent	60	12	720	188	Switch	No	60
24	Borough Hall Annex	First - PD	103	Conference Room	4' linear T12	magnetic	6	4	fluorescent	34	12	9792	2556	Switch	No	816
25	Borough Hall Annex	First - PD	65	Conference Room - Closet	2' U-shaped T12	magnetic	1	2	fluorescent	34	2	136	35	Switch	No	68
26	Borough Hall Annex	First - PD	35	Police Director	4' linear T12	magnetic	7	4	fluorescent	34	12	11424	2982	Switch	No	952

27	Borough Hall Annex	First - PD	5	Police Director - Bath	60W Inc.	-	1	1	incandescent	60	2	120	31	Switch	No	60
28	Borough Hall Annex	First - PD	74	Police Director - Secretary	4' linear T12	magnetic	4	4	fluorescent	34	12	6528	1704	Switch	No	544
29	Borough Hall Annex	First - PD	4	Police Director - Secretary - Closet	60W Inc.	-	1	1	incandescent	60	2	120	31	Switch	No	60
30	Borough Hall Annex	Basement - PD	70	Day Room	4' linear T12	magnetic	8	4	fluorescent	34	12	13056	3408	Switch	No	1088
31	Borough Hall Annex	Basement - PD	38	Mechanical Room	4' linear T12	magnetic	2	2	fluorescent	34	12	1632	426	Switch	No	136
32	Borough Hall Annex	Basement - PD	4	Day Room - Storage	60W Inc.	-	1	1	incandescent	60	2	120	31	Switch	No	60
33	Borough Hall Annex	Basement - PD	50	Gym	4' linear T12	magnetic	4	4	fluorescent	34	24	13056	3408	Switch	No	544
34	Borough Hall Annex	Basement - PD	47	Gym - Storage	60W Inc.	-	1	1	incandescent	60	4	240	63	Switch	No	60
35	Borough Hall Annex	Basement - PD	24	Women's Lounge	4' linear T12	magnetic	3	4	fluorescent	34	24	9792	2556	Switch	No	408
36	Borough Hall Annex	Basement - PD	8	Women's Lounge - Bath	60W Inc.	-	1	1	incandescent	60	4	240	63	Switch	No	60
37	Borough Hall Annex	Basement - PD	28	Men's Locker Room	4' linear T12	magnetic	4	4	fluorescent	34	24	13056	3408	Switch	No	544
38	Borough Hall Annex	Basement - PD	32	Men's Locker - Bath	4' linear T12	magnetic	4	4	fluorescent	34	24	13056	3408	Switch	No	544
39	Borough Hall Annex	Basement - PD	32	Men's Locker - Bath	60W Inc.	-	1	1	incandescent	60	4	240	63	Switch	No	60
40	Borough Hall Annex	Basement - PD	24	Hallway	4' linear T12	magnetic	8	4	fluorescent	34	24	26112	6815	Switch	No	1088
41	Borough Hall Annex	Basement - PD	24	Hallway	Fluorescent Exit Sign	-	2	1	fluorescent	14	24	672	175	Switch	No	28
42	Borough Hall Annex	Basement - PD	5	Photo Lab	60W Inc.	-	1	1	incandescent	60	8	480	125	Switch	No	60
43	Borough Hall Annex	Basement - PD	115	Server Room	4' linear T12	magnetic	2	4	fluorescent	34	24	6528	1704	Switch	No	272
44	Borough Hall Annex	Basement - PD	5	Janitor's Storage	60W Inc.	-	1	1	incandescent	60	2	120	31	Switch	No	60
45	Borough Hall Annex	Basement - PD	63	Equipment Room	4' linear T12	magnetic	4	4	fluorescent	34	12	6528	1704	Switch	No	544
46	Borough Hall Annex	Basement - PD	16	Storage Room	60W Inc.	-	1	1	fluorescent	60	2	120	31	Switch	No	60
47	Borough Hall Annex	Basement - PD	6	Blue Hall Stairs	4' linear T12	magnetic	3	4	fluorescent	34	24	9792	2556	Switch	No	408
48	Borough Hall Annex	Basement - PD	6	Blue Hall Stairs	60W Inc.	-	1	1	incandescent	60	24	1440	376	Switch	No	60
49	Borough Hall Annex	Public Health	87	Public Health	4' linear T12	magnetic	5	4	fluorescent	34	12	8160	2130	Switch	No	680
50	Borough Hall Annex	Public Health	57	Nurse (Children's)	4' linear T12	magnetic	2	4	fluorescent	34	8	2176	568	Switch	No	272
51	Borough Hall Annex	Public Health	125	Closet	4' linear T12	magnetic	1	4	fluorescent	34	2	272	71	Switch	No	136
52	Borough Hall Annex	Public Health	133	Clinic	4' linear T12	magnetic	11	4	fluorescent	34	8	11968	3124	Switch	No	1496
53	Borough Hall Annex	Public Health	90	Exam 2	4' linear T12	magnetic	2	4	fluorescent	34	8	2176	568	Switch	No	272
54	Borough Hall Annex	Public Health	118	Exam 1	4' linear T12	magnetic	2	4	fluorescent	34	8	2176	568	Switch	No	272
55	Borough Hall Annex	Public Health	5	Clinic - Bath	60W Inc.	-	1	1	incandescent	60	4	240	63	Switch	No	60
56	Borough Hall Annex	Public Health	52	Public Women's Room	4' linear T12	magnetic	2	4	fluorescent	34	8	2176	568	Switch	No	272
57	Borough Hall Annex	Public Health	80	Public Men's Room	4' linear T12	magnetic	2	4	fluorescent	34	8	2176	568	Switch	No	272
58	Borough Hall Annex	Public Health	6	Janitor's Closet	60W Inc.	-	1	1	incandescent	60	8	480	125	Switch	No	60
59	Borough Hall Annex	Public Health	90	Front Entrance	4' linear T12	magnetic	9	4	fluorescent	34	12	14688	3834	Switch	No	1224
60	Borough Hall Annex	Public Health	90	Front Entrance	Fluorescent Exit Sign	-	2	1	fluorescent	14	24	672	175	None	No	28
61	Borough Hall Annex	Public Health	99	Front Vestibule	4' linear T12	magnetic	3	4	fluorescent	34	12	4896	1278	Switch	No	408
62	Borough Hall Annex	Public Health	160	Administrative Offices	4' linear T12	magnetic	5	4	fluorescent	34	10	6800	1775	Switch	No	680
63	Borough Hall Annex	Public Health	5	Administrative Office - Bath	60W Inc.	-	1	1	fluorescent	60	4	240	63	Switch	No	60
64	Borough Hall Annex	Public Health	190	Registration	4' linear T12	magnetic	6	4	fluorescent	34	12	9792	2556	Switch	No	816
65	Borough Hall Annex	Public Health	16	Registration - closet (left)	60W Inc.	-	1	1	incandescent	60	2	120	31	Switch	No	60
66	Borough Hall Annex	Public Health	50	File Closet (middle)	4' linear T12 rapid start preheat	magnetic	1	2	fluorescent	40	2	160	42	Switch	No	80
67	Borough Hall Annex	Public Health	200	Sanitary Inspector	4' linear T12	magnetic	4	4	fluorescent	34	8	4352	1136	Switch	No	544
68	Borough Hall Annex	Public Health	90	Sanitary Inspector - Kitchen	4' linear T12	magnetic	3	4	fluorescent	34	8	3264	852	Switch	No	408

Proposed Lighting Conditions															
#	Building	Level/Floor	Location in Building	Fixture Type	Ballast Type	No. of Fixtures	No. of Lamps	Type of Lamp	Watts/Lamp	Hrs/Day	Energy Use (Watt hours/day)	Annual Energy Use (kWh/year)	Controls	Daylighting possible?	Total Power (W)
1	Borough Hall Annex	First - PD	Front Vestibule	4' linear T8	electronic	5	4	fluorescent	32	24	15360	2982	Switch	No	640
2	Borough Hall Annex	First - PD	Men's Room	20W CFL	-	1	1	incandescent	20	12	240	63	Switch	No	20
3	Borough Hall Annex	First - PD	Women's Room	20W CFL	-	1	1	incandescent	20	12	240	63	Switch	No	20
4	Borough Hall Annex	First - PD	Main Hall	4' linear T8	electronic	5	4	fluorescent	32	24	15360	2982	Switch	No	640
5	Borough Hall Annex	First - PD	Main Hall	LED Exit Sign	-	2	1	LED	5	24	240	63	None	No	10
6	Borough Hall Annex	First - PD	Dispatch	4' linear T8	electronic	5	4	fluorescent	32	24	15360	2982	Switch	No	640
7	Borough Hall Annex	First - PD	Dispatch - Bath	2' U-shaped T8	electronic	1	2	fluorescent	32	12	768	200	Switch	No	64
8	Borough Hall Annex	First - PD	Reporting Room	4' linear T8	electronic	2	4	fluorescent	32	12	3072	596	Switch	No	256
9	Borough Hall Annex	First - PD	Criminal Investigation Division	4' linear T8	electronic	10	4	fluorescent	32	12	15360	2982	Switch	No	1280
10	Borough Hall Annex	First - PD	Right Hallway	4' linear T8	electronic	6	4	fluorescent	32	24	18432	3578	Switch	No	768
11	Borough Hall Annex	First - PD	Right Hallway	LED Exit Sign	-	1	1	LED	5	24	120	31	Switch	No	5
12	Borough Hall Annex	First - PD	Detective's Borough	4' linear T8	electronic	4	4	fluorescent	32	12	6144	1193	Switch	No	512
13	Borough Hall Annex	First - PD	Patrol Captain	4' linear T8	electronic	4	4	fluorescent	32	12	6144	1193	Switch	No	512
14	Borough Hall Annex	First - PD	Traffic	4' linear T8	electronic	2	4	fluorescent	32	12	3072	596	Switch	No	256
15	Borough Hall Annex	First - PD	Secretary's Office	4' linear T8	electronic	6	4	fluorescent	32	12	9216	1789	Switch	No	768
16	Borough Hall Annex	First - PD	Custodian's Office	20W CFL	-	1	1	CFL	20	8	160	42	Switch	No	20
17	Borough Hall Annex	First - PD	Side Entrance	4' linear T8	electronic	2	4	fluorescent	32	24	6144	1193	Switch	No	256
18	Borough Hall Annex	First - PD	Cell Hall	4' linear T8	electronic	1	2	fluorescent	32	24	1536	298	Switch	No	64
19	Borough Hall Annex	First - PD	Photo ID Room	4' linear T8	electronic	2	2	fluorescent	32	12	1536	298	Switch	No	128
20	Borough Hall Annex	First - PD	Holding Cells and Room (not used)	4' linear T8	electronic	4	2	fluorescent	32	24	6144	1193	Switch	No	256
21	Borough Hall Annex	First - PD	DWI Room	4' linear T8	electronic	1	4	fluorescent	32	12	1536	298	Switch	No	128
22	Borough Hall Annex	First - PD	Interview 1	4' linear T8	electronic	1	4	fluorescent	32	12	1536	298	Switch	No	128
23	Borough Hall Annex	First - PD	Bath	20W CFL	-	1	1	CFL	20	12	240	63	Switch	No	20
24	Borough Hall Annex	First - PD	Conference Room	4' linear T8	electronic	6	4	fluorescent	32	12	9216	1789	Switch	No	768
25	Borough Hall Annex	First - PD	Conference Room - Closet	2' U-shaped T8	electronic	1	2	fluorescent	32	2	128	25	Switch	No	64
26	Borough Hall Annex	First - PD	Police Director	4' linear T8	electronic	7	4	fluorescent	32	12	10752	2087	Switch	No	896

27	Borough Hall Annex	First - PD	Police Director - Bath	20W CFL	-	1	1	CFI	20	2	40	10	Switch	No	20
28	Borough Hall Annex	First - PD	Police Director - Secretary	4' linear T8	electronic	4	4	fluorescent	32	12	6144	1193	Switch	No	512
29	Borough Hall Annex	First - PD	Police Director - Secretary - Closet	20W CFL	-	1	1	CFL	20	2	40	10	Switch	No	20
30	Borough Hall Annex	Basement - PD	Day Room	4' linear T8	electronic	8	4	fluorescent	32	12	12288	2385	Switch	No	1024
31	Borough Hall Annex	Basement - PD	Mechanical Room	4' linear T8	electronic	2	2	fluorescent	32	12	1536	298	Switch	No	128
32	Borough Hall Annex	Basement - PD	Day Room - Storage	20W CFL	-	1	1	CFL	20	2	40	10	Switch	No	20
33	Borough Hall Annex	Basement - PD	Gym	4' linear T8	electronic	4	4	fluorescent	32	24	12288	2385	Switch	No	512
34	Borough Hall Annex	Basement - PD	Gym - Storage	20W CFL	-	1	1	CFL	20	4	80	21	Switch	No	20
35	Borough Hall Annex	Basement - PD	Women's Lounge	4' linear T8	electronic	3	4	fluorescent	32	24	9216	1789	Switch	No	384
36	Borough Hall Annex	Basement - PD	Women's Lounge - Bath	20W CFL	-	1	1	CFL	20	4	80	21	Switch	No	20
37	Borough Hall Annex	Basement - PD	Men's Locker Room	4' linear T8	electronic	4	4	fluorescent	32	24	12288	2385	Switch	No	512
38	Borough Hall Annex	Basement - PD	Men's Locker - Bath	4' linear T8	electronic	4	4	fluorescent	32	24	12288	2385	Switch	No	512
39	Borough Hall Annex	Basement - PD	Men's Locker - Bath	20W CFL	-	1	1	CFL	20	4	80	21	Switch	No	20
40	Borough Hall Annex	Basement - PD	Hallway	4' linear T8	electronic	8	4	fluorescent	32	24	24576	4771	Switch	No	1024
41	Borough Hall Annex	Basement - PD	Hallway	LED Exit Sign	-	2	1	LED	5	24	240	63	Switch	No	10
42	Borough Hall Annex	Basement - PD	Photo Lab	20W CFL	-	1	1	CFL	20	8	160	42	Switch	No	20
43	Borough Hall Annex	Basement - PD	Server Room	4' linear T8	electronic	2	4	fluorescent	32	24	6144	1193	Switch	No	256
44	Borough Hall Annex	Basement - PD	Janitor's Storage	20W CFL	-	1	1	CFL	20	2	40	10	Switch	No	20
45	Borough Hall Annex	Basement - PD	Equipment Room	4' linear T8	electronic	4	4	fluorescent	32	12	6144	1193	Switch	No	512
46	Borough Hall Annex	Basement - PD	Storage Room	20W CFL	-	1	1	fluorescent	20	2	40	10	Switch	No	20
47	Borough Hall Annex	Basement - PD	Blue Hall Stairs	4' linear T8	electronic	3	4	fluorescent	32	24	9216	1789	Switch	No	384
48	Borough Hall Annex	Basement - PD	Blue Hall Stairs	20W CFL	-	1	1	CFL	20	24	480	125	Switch	No	20
49	Borough Hall Annex	Public Health	Public Health	4' linear T8	electronic	5	4	fluorescent	32	12	7680	1491	Switch	No	640
50	Borough Hall Annex	Public Health	Nurse (Children's)	4' linear T8	electronic	2	4	fluorescent	32	8	2048	398	Switch	No	256
51	Borough Hall Annex	Public Health	Closet	4' linear T8	electronic	1	4	fluorescent	32	2	256	50	Switch	No	128
52	Borough Hall Annex	Public Health	Clinic	4' linear T8	electronic	11	4	fluorescent	32	8	11264	2187	Switch	No	1408
53	Borough Hall Annex	Public Health	Exam 2	4' linear T8	electronic	2	4	fluorescent	32	8	2048	398	Switch	No	256
54	Borough Hall Annex	Public Health	Exam 1	4' linear T8	electronic	2	4	fluorescent	32	8	2048	398	Switch	No	256
55	Borough Hall Annex	Public Health	Clinic - Bath	20W CFL	-	1	1	CFL	20	4	80	21	Switch	No	20
56	Borough Hall Annex	Public Health	Public Women's Room	4' linear T8	electronic	2	4	fluorescent	32	8	2048	398	Switch	No	256
57	Borough Hall Annex	Public Health	Public Men's Room	4' linear T8	electronic	2	4	fluorescent	32	8	2048	398	Switch	No	256
58	Borough Hall Annex	Public Health	Janitor's Closet	20W CFL	-	1	1	CFL	20	8	160	42	Switch	No	20
59	Borough Hall Annex	Public Health	Front Entrance	4' linear T8	electronic	9	4	fluorescent	32	12	13824	2683	Switch	No	1152
60	Borough Hall Annex	Public Health	Front Entrance	LED Exit Sign	-	2	1	LED	5	24	240	63	None	No	10
61	Borough Hall Annex	Public Health	Front Vestibule	4' linear T8	electronic	3	4	fluorescent	32	12	4608	894	Switch	No	384
62	Borough Hall Annex	Public Health	Administrative Offices	4' linear T8	electronic	5	4	fluorescent	32	10	6400	1242	Switch	No	640
63	Borough Hall Annex	Public Health	Administrative Office - Bath	20W CFL	-	1	1	CFL	20	4	80	21	Switch	No	20
64	Borough Hall Annex	Public Health	Registration	4' linear T8	electronic	6	4	fluorescent	32	12	9216	1789	Switch	No	768
65	Borough Hall Annex	Public Health	Registration - closet (left)	20W CFL	-	1	1	CFL	20	2	40	10	Switch	No	20
66	Borough Hall Annex	Public Health	File Closet (middle)	4' linear T8	electronic	1	2	fluorescent	32	2	128	29	Switch	No	64
67	Borough Hall Annex	Public Health	Sanitary Inspector	4' linear T8	electronic	4	4	fluorescent	32	8	4096	795	Switch	No	512
68	Borough Hall Annex	Public Health	Sanitary Inspector - Kitchen	4' linear T8	electronic	3	4	fluorescent	32	8	3072	596	Switch	No	384

Existing Lighting Usage (kWh/year)	93,874
Proposed Lighting Usage (kWh/year)	64,887
Existing Lighting Costs (\$/year)	\$14,081
Proposed Lighting Costs (\$/year)	\$9,733
Estimated Savings (kWh/year)	28,987
Estimated Savings (\$/year)	\$4,348
Existing Lighting Power Density (W/sqft)	2.0
Proposed Lighting Power Density (W/sqft)	1.8

Appendix B: Third Party Energy Suppliers (ESCOs)

Third Party Electric Suppliers for PSEG Service Territory	Telephone & Web Site
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com
BOC Energy Services, Inc. 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.boc.com
Commerce Energy, Inc. 4400 Route 9 South, Suite 100 Freehold, NJ 07728	(800) 556-8457 www.commerceenergy.com
ConEdison Solutions 535 State Highway 38 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 www.newenergy.com
Credit Suisse, (USA) Inc. 700 College Road East Princeton, NJ 08450	(212) 538-3124 www.creditsuisse.com
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com
FirstEnergy Solutions 300 Madison Avenue Morristown, NJ 07926	(800) 977-0500 www.fes.com
Glacial Energy of New Jersey, Inc. 207 LaRoche Avenue Harrington Park, NJ 07640	(877) 569-2841 www.glacialenergy.com
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	(888) 536-3876 www.metroenergy.com
Integrus Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrusenergy.com
Liberty Power Delaware, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866) 769-3799 www.libertypowercorp.com
Liberty Power Holdings, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(800) 363-7499 www.libertypowercorp.com
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) 363-7499 www.pepco-services.com
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com
Sempra Energy Solutions 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.semprasolutions.com
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.southjerseyenergy.com
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com
Strategic Energy, LLC 55 Madison Avenue, Suite 400 Morristown, NJ 07960	(888) 925-9115 www.sel.com
Suez Energy Resources NA, Inc. 333 Thornall Street, 6th Floor Edison, NJ 08837	(888) 644-1014 www.suezenergyresources.com
UGI Energy Services, Inc. 704 East Main Street, Suite 1 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com

Third Party Gas Suppliers for PSEG Service Territory	Telephone & Web Site
Cooperative Industries 412-420 Washington Avenue Belleville, NJ 07109	(800) 628-9427 www.cooperativenet.com
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com
Dominion Retail, Inc. 395 Highway 170, Suite 125 Lakewood, NJ 08701	(866) 275-4240 www.retail.dom.com
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com
UGI Energy Services, Inc. 704 East Main Street, Suite 1 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com
Great Eastern Energy 116 Village Riva, Suite 200 Princeton, NJ 08540	(888) 651-4121 www.greatastern.com
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com
Hudson Energy Services, LLC 545 Route 17 South Ridgewood, NJ 07450	(877) 483-7669 www.hudsonenergyservices.com
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	(800) 724-1880 www.intelligentenergy.org
Keil & Sons 1 Bergen Blvd. Fairview, NJ 07002	(877) 797-8786 www.systremenergy.com
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	(888) 536-3876 www.metroenergy.com
MxEnergy, Inc. 510 Thornall Street, Suite 270 Edison, NJ 08837	(800) 375-1277 www.mxenergy.com
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	(800) 840-4427 www.natgasco.com
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	(800) 363-7499 www.pepco-services.com
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com
Sempra Energy Solutions 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.semprasolutions.com
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.southjerseyenergy.com
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com
Stuyvesant Energy LLC 10 West Ivy Lane, Suite 4 Englewood, NJ 07631	(800) 646-6457 www.stuyfuel.com
Woodruff Energy 73 Water Street Bridgeton, NJ 08302	(800) 557-1121 www.woodruffenergy.com