



Wayne Township

Administration Building, Public Library, DPW Garage, Waste Water Treatment Plant and Pump Stations

Prepared For:
Wayne Township

Matthew Cavallo
Specifications Writer
Purchasing Department
Wayne Township
475 Valley Road
Wayne, NJ 07470

Prepared By:
Dome-Tech, Inc.

Prepared Under the
Guidelines of the State of NJ Local
Government Energy
Audit Program

July, 2014



510 Thornall Street, Suite 170
Edison, NJ 08837
Phone: 732-590-0122
Fax: 732-590-0129

Energy Audit Report - Final



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WAYNE TOWNSHIP
LGEA REPORT

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July 27th, 2014

Neal Bellet
Business Administrator
475 Valley Road
Wayne, NJ 07470

**Re: EXECUTIVE SUMMARY FOR WAYNE TOWNSHIP (11 BUILDINGS)
STATE OF NEW JERSEY LOCAL GOVERNMENT ENERGY AUDIT REPORT
DOME-TECH PROJECT NUMBER D13420**

Dear Mr. Bellet:

Dome-Tech was retained by Wayne Township as a pre-qualified participant in the Local Government Energy Audit Program to perform an energy audit. The objectives of the energy audit were to evaluate the Township's energy consumption, establish baselines for energy efficiency, and identify opportunities to reduce the amount of energy used and/or its cost.

The scope of the audit is standardized under the program, and consisted of the following:

- Benchmarking historic energy consumption utilizing the EPA Energy Star Portfolio Manager
- Characterizing building use, occupancy, size, and construction
- Providing a detailed equipment list including estimated service life and efficiency
- Identifying and quantifying Energy Conservation Measures (ECMs)
- Evaluating the economic viability of various renewable/distributed energy technologies
- Performing a utility tariff analysis and assessing savings potential from energy procurement strategies
- Providing the method of analysis.

Based upon data received for the twelve (12) month period March 2013 – February 2014, the facilities included in this study had an annual expenditure of:

- Electricity: Approximately 12,726,305 kWh at a total cost of approximately \$1,661,123
- Natural Gas: Approximately 99,197 Therms at a total cost of approximately \$108,312

The following buildings were evaluated under this study:

Facility Name	Total Floor Area SF
Municipal Building/Police Department	58,400
Mountain View WPCF (Wet Phase)	36,730
Mountain View WPCF (Dry Phase)	47,250
DPW Garage	30,600
Public Library	37,800
West Belt Water Pump Station	3,000
Wanaque Water Pump Station	800
Jacobus Water Pump Station	2,200
Lower Preakness Sewer Pump Station	2,200

Sheffield Sewer Pump Station	2,000
Alps Road Water Pump Station	2,200

Please refer to Section 2 of this report for a detailed list of identified Energy Conservation Measures (ECMs), along with a summary of their preliminary economics (estimated project cost, estimated annual energy savings, applicable rebate(s), etc.). In this report, all identified ECMs are ranked and presented according to their simple payback. Please note that the Master ECM Table can also be sorted by building, by measure type, etc.

If all identified ECMs were to be implemented, they would provide the following estimated benefits to the Warren County Community College:

- Total annual electrical savings: Approximately 1,490,898 kilowatt-hours of electric consumption; 11.7% of baseline
- Total annual natural gas savings: 7,783 Therms net increase in natural gas usage due to fuel-switching; -7.8% of baseline (net increase)
- Total annual cost savings: Approximately \$220,452 of utility cost; 12.5% of baseline
- Total annual CO₂ emissions reduction: 632 Tons
- Total net estimated implementation cost: Approximately \$1,876,157
- Total average simple payback: 8.5 years

A summary of the projects that are recommended for implementation includes the following: Upgrading interior and exterior lighting and controls, variable frequency drives, personal computer "plug load" controls, vending machine controls, and several other HVAC systems and control upgrades.

Distributed/Renewable Energy Systems were also reviewed with the following conclusions:

- Roof-mounted photovoltaic systems ranging in size from 54 kW dc and 137 kW dc (301 kW dc total) could provide approximately 16% to 61% of each building's annual energy usage (21% of total energy usage for the three buildings). In spite of the relatively low utility costs and low current REC (Renewable Energy Credit) prices, solar energy appears to be a viable investment option for the Township. The Township may consider engaging in a PPA (Power Purchase Agreement) with a solar energy developer in order to reduce investment risks and operational burdens. Should the Township decide to pursue a solar PPA, Dome-Tech recommends commissioning a more detailed study and market analysis.
- CHP (Combined Heat and Power) was also considered. An analysis is performed for the Waste Water Treatment Plant.

The data from all eleven buildings was entered into the US EPA *ENERGY STAR's Portfolio Manager* Database program. Buildings with scores of 75 or higher may qualify for the *ENERGY STAR* Building Label. Township buildings are currently not eligible to receive an Energy Star score in the EPA's Energy Star Portfolio Manager. Nevertheless, the building EUI (Energy Use Intensity) can be utilized as a benchmarking tool for comparing the energy consumption of each.

Regarding the procurement of utilities, Dome-Tech understands that the Township facilities in this study are served by ten (10) electric accounts behind Jersey Central Power & Light (JCPL) and Public Service Electric Gas Company (PSE&G) and five (5) natural gas accounts behind Public Service Electric Gas Company



(PSE&G). All major electricity and natural gas accounts were served Hess respectively, third-party retail energy suppliers, during the period analyzed in the study. It is recommended to continue evaluating third party suppliers for the lowest commodity rates.

During the development of this audit, Dome-Tech was assisted by facility personnel who were both knowledgeable and very helpful to our efforts. We would like to acknowledge and thank those individuals.

Sincerely,

Ersin Gercek, PE, CEM, LEED AP, CPMP
Senior Energy Engineer



WAYNE TOWNSHIP LGEA
Energy Conservation Measures

ECM #	Energy Conservation Measures (ECM)	Buildings	Energy Savings kWh	Demand Savings kW	Energy Savings Therms	Energy Savings Oil	Gross Installation Cost*	Rebates/ Incentives	Avoided Cost	Net Implementation Costs	Annual Energy Cost Savings	Annual Oper. Cost Savings	Total Annual Cost Savings	Simple Payback	Internal Rate of Return (IRR) (Net)	Measure Life Yrs	Lifecycle Savings (NPV)	CO2 Savings Tons
1	Computer Power Management	Municipal Building / Police Dept	25,696	0	0		\$5,340	\$0	\$0	\$5,340	\$3,600	\$0	\$3,600	1.5	61%	5	\$10,688	8.6
1	Computer Power Management	Public Library	18,665	0	0		\$3,480	\$0	\$0	\$3,480	\$2,695	\$0	\$2,695	1.3	72%	5	\$8,517	6.2
1	Computer Power Management	DPW Garage	2,394	0	0		\$600	\$0	\$0	\$600	\$357	\$0	\$357	1.7	52%	5	\$988	0.8
2	Lighting Equipment Upgrade	DPW Garage	57,244	26	0		49,764	12,880	0	\$36,884	\$8,528	\$0	\$8,528	4.3	19%	10	\$32,284	19.1
2	Lighting Equipment Upgrade	Mountain View WPCF (Wet&Dry)	89,960	18	0		74,304	16,780	0	\$57,524	\$11,287	\$0	\$11,287	5.1	15%	10	\$34,025	30.0
2	Lighting Equipment Upgrade	Municipal Building / Police Dept	65,441	22	0		93,740	23,630	0	\$70,110	\$9,169	\$0	\$9,169	7.6	5%	10	\$4,262	21.8
2	Lighting Equipment Upgrade	Public Library	74,059	22	0		93,104	21,180	0	\$71,924	\$10,693	\$0	\$10,693	6.7	8%	10	\$14,807	24.7
2	Lighting Equipment Upgrade	Pump Station - Alps Rd.	271	1	0		2,004	440	0	\$1,564	\$38	\$0	\$38	40.7	-20%	10	(\$1,253)	0.1
2	Lighting Equipment Upgrade	Pump Station - Jacobus	32	0	0		150	40	0	\$110	\$4	\$0	\$4	26.3	-15%	10	(\$76)	0.0
2	Lighting Equipment Upgrade	Pump Station - Lower Preakness	669	1	0		2,454	540	0	\$1,914	\$105	\$0	\$105	18.2	-10%	10	(\$1,063)	0.2
2	Lighting Equipment Upgrade	Pump Station - Sheffield Sewer	445	1	0		1,500	140	0	\$1,360	\$58	\$0	\$58	23.5	-13%	10	(\$890)	0.1
2	Lighting Equipment Upgrade	Pump Station - Wanaque	71	0	0		384	80	0	\$304	\$8	\$0	\$8	36.3	-18%	10	(\$236)	0.0
2	Lighting Equipment Upgrade	Pump Station - West Belt	855	2	0		3,756	950	0	\$2,806	\$111	\$0	\$111	25.2	-14%	10	(\$1,904)	0.3
3	Lighting Controls Upgrade	DPW Garage	12,377	0	0		9,860	1,390	0	\$8,470	\$1,844	\$0	\$1,844	4.6	17%	10	\$6,485	4.1
3	Lighting Controls Upgrade	Mountain View WPCF (Wet&Dry)	9,493	0	0		15,000	2,100	0	\$12,900	\$1,191	\$0	\$1,191	10.8	-1%	10	(\$3,239)	3.2
3	Lighting Controls Upgrade	Municipal Building / Police Dept	11,046	0	0		22,870	4,655	0	\$18,215	\$1,548	\$0	\$1,548	11.8	-3%	10	(\$5,661)	3.7
3	Lighting Controls Upgrade	Public Library	20,734	0	0		12,000	1,680	0	\$10,320	\$2,994	\$0	\$2,994	3.4	26%	10	\$13,962	6.9
4	AC Unit Upgrades	Municipal Building / Police Dept	57,422	38	924		\$151,984	\$6,804	\$0	\$145,180	\$8,889	\$0	\$8,889	16.3	2%	20	(\$24,371)	24.5
4	AC Unit Upgrades	Mountain View WPCF (Wet&Dry)	26,408	16	0		\$37,700	\$1,200	\$0	\$36,500	\$3,313	\$0	\$3,313	11.0	7%	20	\$8,530	8.8
5	Boiler Replacement	Municipal Building / Police Dept	0	0	5,482		\$150,000	\$3,000	\$0	\$147,000	\$5,007	\$0	\$5,007	29.4	-1%	25	(\$68,780)	32.1
5	Boiler Replacement	Public Library	0	0	951		\$40,000	\$1,313	\$0	\$38,688	\$891	\$0	\$891	43.4	-4%	25	(\$24,762)	5.6
6	Building Automation System	DPW Garage	22,500	0	1,754		\$76,500	\$5,354	\$0	\$71,146	\$5,057	\$0	\$5,057	14.1	1%	15	(\$14,915)	17.8
6	Building Automation System	Mountain View WPCF (Wet&Dry)	41,990	0	1,866	1,500	\$209,950	\$8,585	\$0	\$201,365	\$12,995	\$0	\$12,995	15.5	0%	15	(\$56,887)	41.4
6	Building Automation System	Municipal Building / Police Dept	95,980	0	3,384		\$146,000	\$18,740	\$0	\$127,260	\$16,539	\$0	\$16,539	7.7	10%	15	\$56,627	51.8
6	Building Automation System	Public Library	30,258	0	1,458		\$93,885	\$6,299	\$0	\$87,586	\$5,735	\$0	\$5,735	15.3	0%	15	(\$23,816)	18.6
7	Premium Efficiency Motors	Mountain View WPCF (Wet&Dry)	30,019	8	0		\$42,979	\$1,685	\$0	\$41,294	\$3,766	\$0	\$3,766	11.0	7%	20	\$9,893	10.0
8	Vending Machine Controls	DPW Garage	1,934	0	0		\$550	\$0	\$0	\$550	\$288	\$0	\$288	1.9	44%	5	\$733	0.6
8	Vending Machine Controls	Municipal Building / Police Dept	3,868	0	0		\$1,100	\$0	\$0	\$1,100	\$542	\$0	\$542	2.0	40%	5	\$1,313	1.3
8	Vending Machine Controls	Public Library	2,257	0	0		\$825	\$0	\$0	\$825	\$326	\$0	\$326	2.5	28%	5	\$625	0.8
9	Aeration System Controls Upgrade	Mountain View WPCF (Wet&Dry)	122,292	28	0		\$98,000	\$19,567	\$0	\$78,433	\$15,344	\$0	\$15,344	5.1	18%	15	\$92,165	40.7
10	Service Water Pump Replacement	Mountain View WPCF (Wet&Dry)	29,397	0	0		\$74,700	\$4,704	\$0	\$69,996	\$3,688	\$0	\$3,688	19.0	2%	25	(\$12,376)	9.8
11	Boiler Fuel Switching	Mountain View WPCF (Wet&Dry)	147,108	0	-23,601	15,000	\$165,000	\$2,000	\$0	\$163,000	\$20,946	\$0	\$20,946	7.8	12%	25	\$164,213	75.8
12	Variable Frequency Drives	Mountain View WPCF (Wet&Dry)	181,704	6	0	0	\$171,193	\$42,697	\$0	\$128,496	\$22,798	\$0	\$22,798	5.6	16%	15	\$124,983	60.5
12	Variable Frequency Drives	Pump Station - West Belt	308,309	8	0	0	\$300,423	\$66,510	\$0	\$233,913	\$40,095	\$0	\$40,095	5.8	15%	15	\$211,881	102.7
Total			1,490,898	196	-7,783	16,500	\$2,151,099	\$274,942	\$0	\$1,876,157	\$220,452	\$0	\$220,452	8.5	-	-	-	632

Notes:

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2. Rebates- Where Zero (0) values are shown in the table we could not find any rebates of other financial incentives that are currently available for this measure.
3. Gross Installation Cost is the cost of installing equipment recommended by the ECM.
4. Avoided Cost is the cost of replacing equipment at end of service life with like and kind equipment.
5. Net Implementation Cost is the Gross Installation Cost less any Rebate/Incentive and any Avoided Cost. In the case of equipment that is being replaced regardless.
- Net Implementation Cost represents the incremental cost incurred by upgrading to equipment that produces more energy savings.
6. Interest Rate is set to 4% for NPV calculations
7. Rebate column includes NJ Smartstart Program Equipment Rebates

**WAYNE TOWNSHIP LGEA
Energy Conservation Measures**

ECM #	Energy Conservation Measures (ECM)	Buildings	Energy Savings kWh	Demand Savings kW	Energy Savings Therms	Energy Savings Oil	Gross Installation Cost*	Rebates/ Incentives	Avoided Cost	Net Implementation Costs	Annual Energy Cost Savings	Annual Oper. Cost Savings	Total Annual Cost Savings	Simple Payback	Internal Rate of Return (IRR) (Net)	Measure Life Yrs	Lifecycle Savings (NPV)	CO2 Savings Tons
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12	Variable Frequency Drives	Pump Station - West Belt	308,309	8	0	0	\$300,423	\$3,510	\$0	\$296,913	\$40,095	\$0	\$40,095	7.4	10%	15	\$148,881	102.7
9	Aeration System Controls Upgrade	Mountain View WPCF (Wet&Dry)	122,292	28	0		\$98,000	\$19,567	\$0	\$78,433	\$15,344	\$0	\$15,344	5.1	18%	15	\$92,165	40.7
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6	Building Automation System	Municipal Building / Police Dept	95,980	0	3,384		\$146,000	\$18,740	\$0	\$127,260	\$16,539	\$0	\$16,539	7.7	10%	15	\$56,627	51.8
2	Lighting Equipment Upgrade	Mountain View WPCF (Wet&Dry)	89,960	18	0		74,304	16,780	0	\$57,524	\$11,287	\$0	\$11,287	5.1	15%	10	\$34,025	30.0
2	Lighting Equipment Upgrade	DPW Garage	57,244	26	0		49,764	12,880	0	\$36,884	\$8,528	\$0	\$8,528	4.3	19%	10	\$32,284	19.1
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5. Net Implementation Cost is the Gross Installation Cost less any Rebate/Incentive and any Avoided Cost. In the case of equipment that is being replaced regardless. Net Implementation Cost represents the incremental cost incurred by upgrading to equipment that produces more energy savings.
6. Interest Rate is set to 4% for NPV calculations
7. Rebate column includes NJ Smartstart Program Equipment Rebates

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Energy Audit Purpose & Scope

Purpose:

- The objectives of the energy audit are to evaluate each site's energy consumption, establish baselines for energy efficiency, and identify opportunities to reduce the amount of energy used and/or its cost.

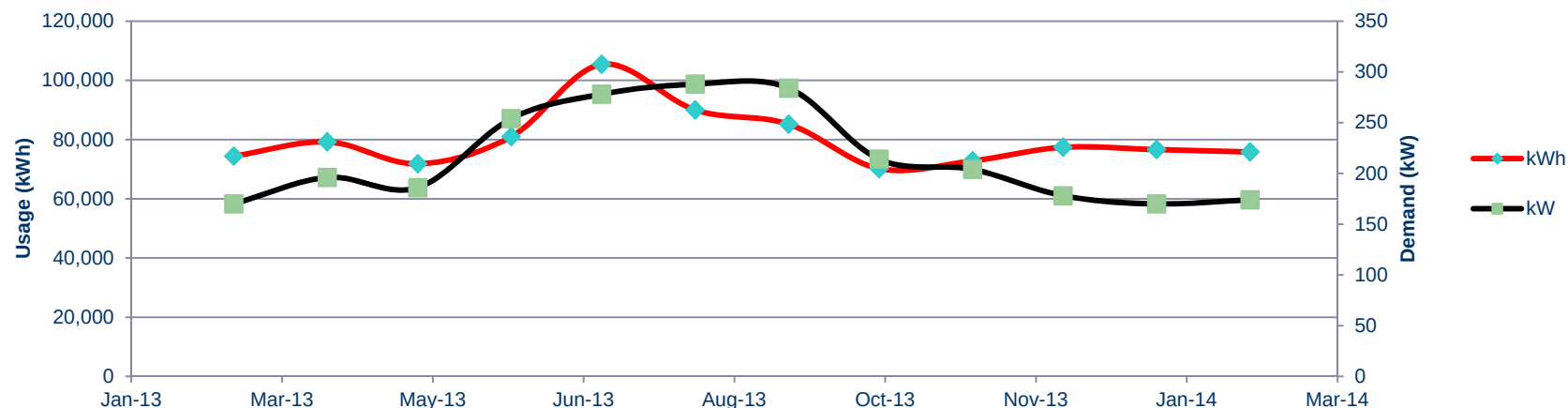
Scope:

- I. Historic Energy Consumption: Benchmark energy use using Energy Star Portfolio Manager
- II. Facility Description: Characterize building usage, occupancy, size and construction.
- III. Equipment Inventory: Detailed equipment list including useful life and efficiency.
- IV. Energy Conservation Measures: Identify and evaluate opportunities for cost savings and economic returns.
- V. Renewable/Distributed Energy Measures: Evaluate economic viability of various renewable/distributed energy technologies.
- VI. Energy Purchasing and Procurement Strategies: Perform utility tariff analysis and assess potential for savings from energy procurement strategies.
- VII. Method of Analysis: Appendices



Historic Energy Consumption

Utility Usage and Costs Summary, Municipal Building and Police Dept. – Electric (2013-2014)



475 Valley Rd - ELECTRIC USAGE SUMMARY					
Utility Provider	Public Service Electric Gas Company (PSEG)				
Account Numbers	42 173 503 09				
Meter Numbers	778015461				
Rate	LPLS				
Third Party Supplier	HESS		Account #	-	
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost*	Total Cost
Mar-13	74,400	170	\$3,072	\$8,515	\$11,587
Apr-13	79,200	196	\$3,300	\$9,362	\$12,661
May-13	71,800	186	\$3,056	\$8,266	\$11,322
Jun-13	81,000	254	\$5,774	\$6,318	\$12,092
Jul-13	105,400	278	\$6,884	\$8,236	\$15,120
Aug-13	90,000	288	\$6,539	\$7,028	\$13,567
Sep-13	85,200	284	\$6,347	\$6,646	\$12,992
Oct-13	70,200	214	\$3,254	\$5,476	\$8,730
Nov-13	72,800	204	\$3,302	\$5,691	\$8,993
Dec-13	77,400	178	\$3,349	\$6,037	\$9,386
Jan-14	76,600	170	\$3,248	\$5,975	\$9,223
Feb-14	75,800	174	\$3,177	\$5,631	\$8,809
Totals/Average	959,800	216	\$51,301	\$83,182	\$134,484

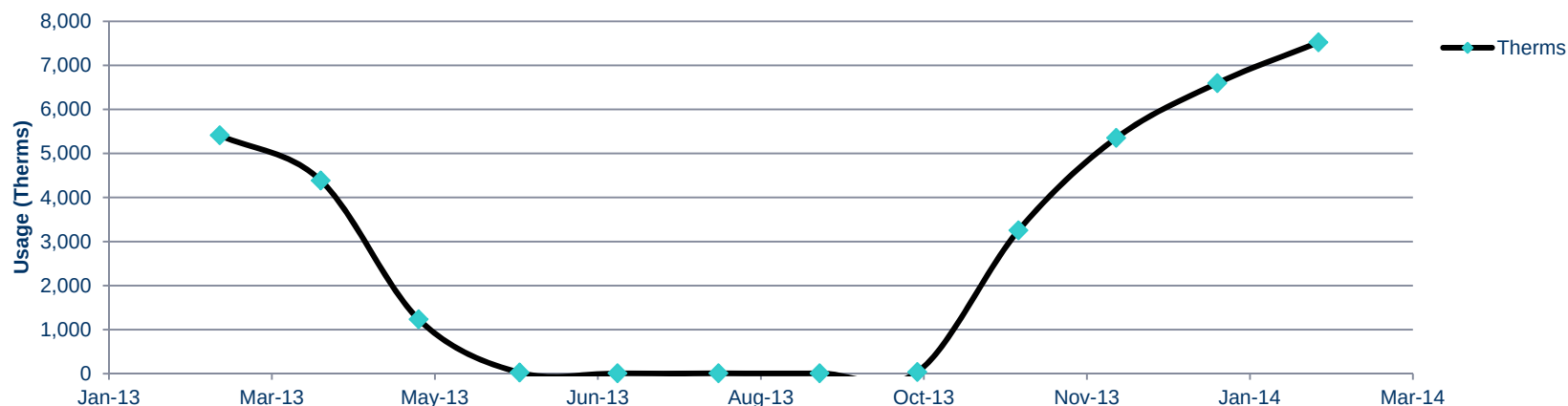
Average Delivery Rate	\$0.05 /kWh
Average Supply Rate	\$0.09 /kWh
Average Rate	\$0.14 /kWh
Annual Peak Demand	288 kW

LPLS: Large Primary Lighting Secondary Service



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, Municipal Building and Police Dept. - Gas (2013-2014)



MUNICIPAL BUILDING / POLICE DEPT. - NATURAL GAS USAGE SUMMARY				
Utility Provider	Public Service Electric Gas Company (PSEG)			
Account Number	42 173 503 09	Meter #	3499903	
Rate	LVG			
Third Party Supplier	HESS	Account #	N/A	
Month	Usage Therms	Delivery Cost	Supply Cost*	Total Cost
Mar-13	5,411	\$2,116	\$2,710	\$4,826
Apr-13	4,384	\$605	\$2,158	\$2,763
May-13	1,235	\$270	\$680	\$949
Jun-13	25	\$108	\$14	\$121
Jul-13	8	\$105	\$4	\$109
Aug-13	8	\$105	\$4	\$110
Sep-13	9	\$105	\$5	\$110
Oct-13	36	\$109	\$20	\$129
Nov-13	3,252	\$1,563	\$1,688	\$3,250
Dec-13	5,352	\$2,006	\$2,854	\$4,860
Jan-14	6,596	\$2,257	\$3,832	\$6,089
Feb-14	7,520	\$2,531	\$5,057	\$7,588
Totals/Average	33,836	\$11,881	\$19,025	\$30,906

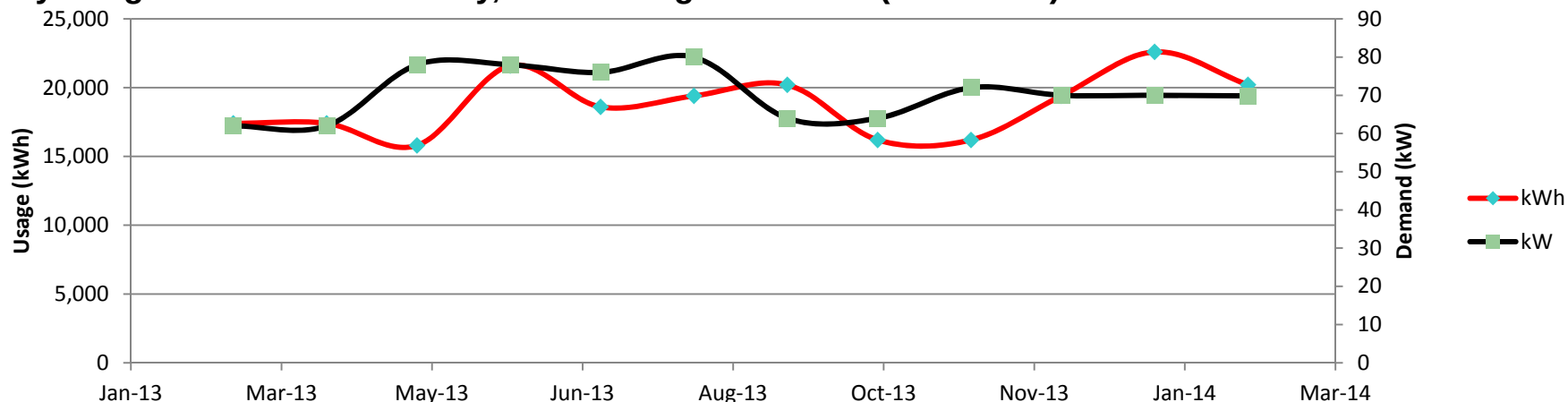
Average Delivery Rate	\$0.35 /Therm
Average Supply Rate	\$0.56 /Therm
Average Rate	\$0.91 /Therm

Where italic: Usage estimated based on delivery cost
LVG: Large Volume Gas Service



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, DPW Garage – Electric (2013-2014)



DPW GARAGE - ELECTRIC USAGE SUMMARY					
Utility Provider	Public Service Electric Gas Company (PSEG)				
Account Numbers	70 207 295 09				
Meter Numbers	728002025				
Rate	GLP				
Third Party Supplier	HESS	Account #	-		
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost*	Total Cost
Mar-13	17,400	62	\$827	\$1,991	\$2,818
Apr-13	17,400	62	\$827	\$2,057	\$2,884
May-13	15,800	78	\$763	\$1,819	\$2,582
Jun-13	21,600	78	\$1,813	\$1,685	\$3,498
Jul-13	18,600	76	\$1,712	\$1,453	\$3,166
Aug-13	19,400	80	\$1,720	\$1,515	\$3,235
Sep-13	20,200	64	\$1,801	\$1,576	\$3,377
Oct-13	16,200	64	\$831	\$1,264	\$2,095
Nov-13	16,200	72	\$831	\$1,266	\$2,097
Dec-13	19,400	70	\$975	\$1,513	\$2,488
Jan-14	22,600	70	\$1,058	\$1,763	\$2,821
Feb-14	20,200	70	\$958	\$1,501	\$2,459
Totals/Average	225,000	70	\$14,116	\$19,403	\$33,519

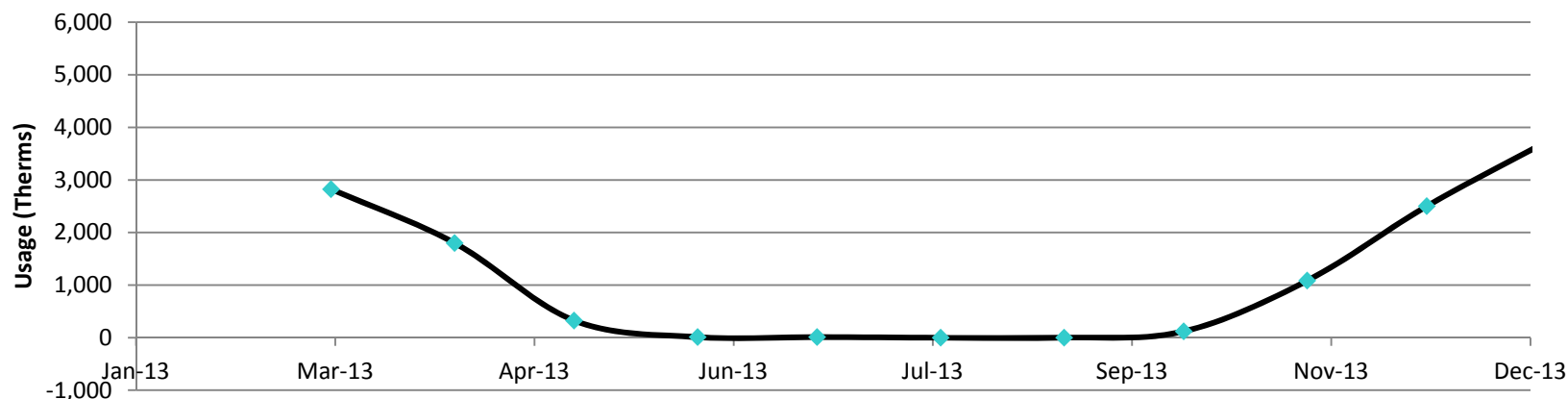
Average Delivery Rate	\$0.06 /kWh
Average Supply Rate	\$0.09 /kWh
Average Rate	\$0.15 /kWh
Annual Peak Demand	80 kW

Where italic: Usage estimated based on delivery cost
GLP: General Lighting and Power Service



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, DPW Garage – Gas (2013-2014)



DPW GARAGE - NATURAL GAS USAGE SUMMARY				
Utility Provider	Public Service Electric Gas Company (PSEG)			
Account Number	70 205 327 05		Meter #	2744845
Rate	LVG			
Third Party Supplier	HESS	Account #	-	
Month	Usage Therms	Delivery Cost	Supply Cost*	Total Cost
Mar-13	2,824	\$1,147	\$1,414	\$2,561
Apr-13	1,799	\$330	\$886	\$1,215
May-13	325	\$150	\$179	\$329
Jun-13	11	\$106	\$6	\$112
Jul-13	11	\$106	\$6	\$112
Aug-13	0	\$104	\$0	\$104
Sep-13	0	\$104	\$0	\$104
Oct-13	120	\$121	\$66	\$187
Nov-13	1,086	\$725	\$564	\$1,288
Dec-13	2,502	\$1,027	\$1,334	\$2,361
Jan-14	3,772	\$1,408	\$2,191	\$3,599
Feb-14	5,085	\$1,663	\$3,419	\$5,083
Totals/Average	17,536	\$6,990	\$10,066	\$17,056

Average Delivery Rate	\$0.40 /Therm
Average Supply Rate	\$0.57 /Therm
Average Rate	\$0.97 /Therm

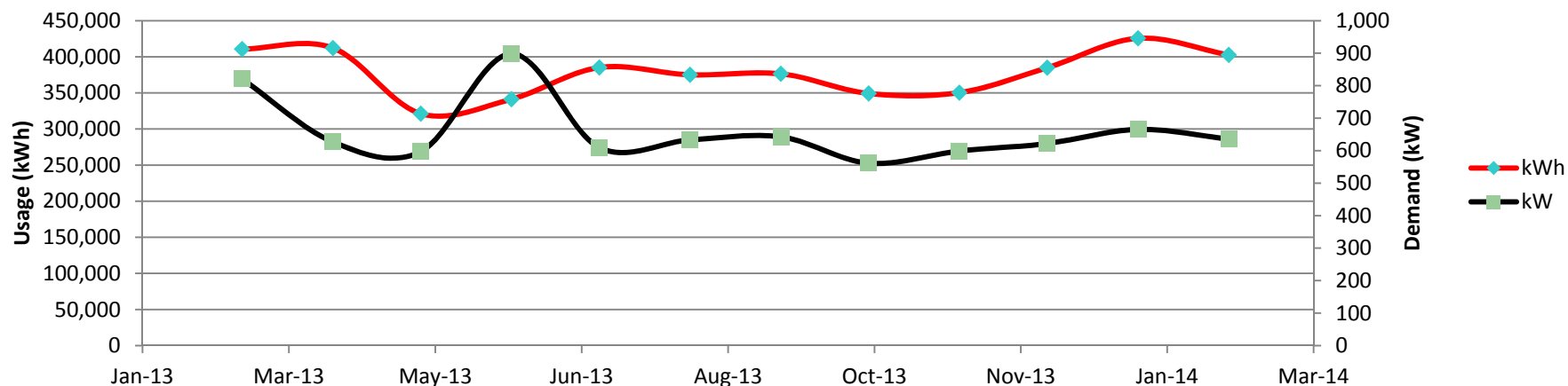
LVG: Large Gas Service

*Supplier Cost is based on average aggregated cost



Historic Energy Consumption (cont'd)

Waste Water Treatment Plant (Wet & Dry Phase) - Electric (2013-2014)



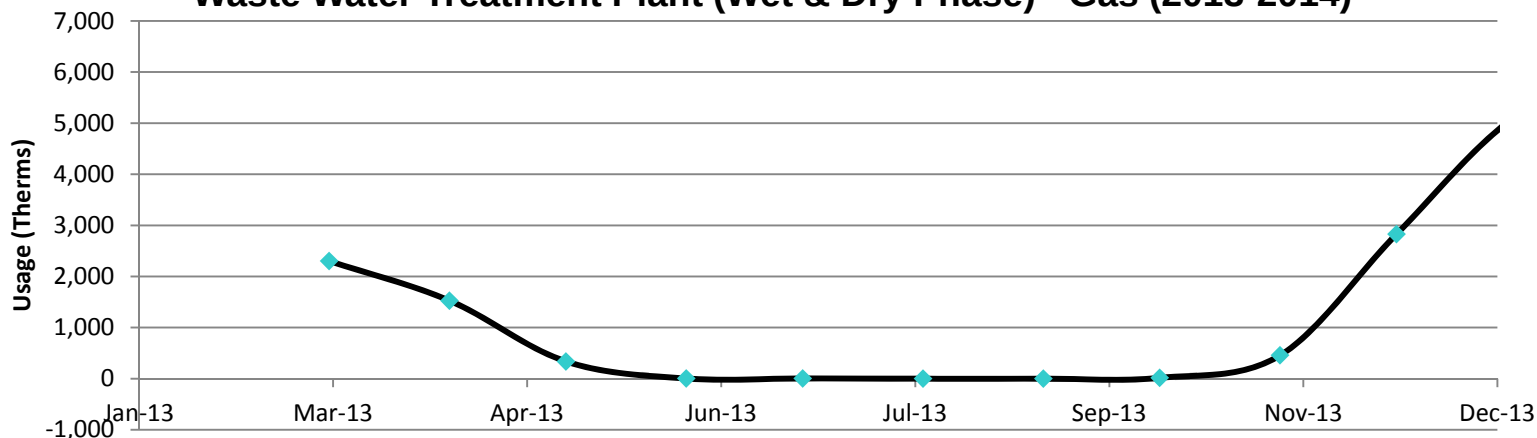
WASTE WATER TREATMENT PLANT - ELECTRIC USAGE SUMMARY					
Utility Provider	Public Service Electric Gas Company (PSEG)				
Account Numbers	42 171 007 01				
Meter Numbers	778016029				
Rate	LPLP				
Third Party Supplier	HESS	As of May 2013	Account #	646874	
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost	Total Cost
Mar-13	410,628	821	\$13,253	\$46,996	\$60,250
Apr-13	412,120	627	\$12,969	\$48,714	\$61,683
May-13	321,244	597	\$10,374	\$36,984	\$47,358
Jun-13	341,336	898	\$17,017	\$26,625	\$43,642
Jul-13	385,161	610	\$18,651	\$30,098	\$48,749
Aug-13	375,019	633	\$18,465	\$29,285	\$47,750
Sep-13	376,391	643	\$18,573	\$29,360	\$47,933
Oct-13	349,210	562	\$11,816	\$27,239	\$39,056
Nov-13	350,387	599	\$11,934	\$27,392	\$39,326
Dec-13	384,847	622	\$13,011	\$30,019	\$43,030
Jan-14	425,580	665	\$14,046	\$33,197	\$47,243
Feb-14	402,527	636	\$13,009	\$29,904	\$42,913
Totals/Average	4,534,450	659	\$173,120	\$395,813	\$568,933

Average Delivery Rate	\$0.04 /kWh
Average Supply Rate	\$0.09 /kWh
Average Rate	\$0.13 /kWh
Annual Peak Demand	898 kW

LPLS: Large Primary Lighting Secondary Service

Historic Energy Consumption (cont'd)

Waste Water Treatment Plant (Wet & Dry Phase) - Gas (2013-2014)



WASTE WATER TREATMENT PLANT - NATURAL GAS USAGE SUMMARY				
Utility Provider	Public Service Electric Gas Company (PSEG)			
Account Number	70 205 244 00	Meter #	2415055	
Rate	GSG (HTG)			
Third Party Supplier	HESS	Account #	620263/620393	
Month	Usage Therms	Delivery Cost	Supply Cost*	Total Cost
Mar-13	2,303	\$5,330	\$1,153	\$6,483
Apr-13	1,527	\$524	\$752	\$1,276
May-13	338	\$229	\$186	\$415
Jun-13	5	\$117	\$2	\$119
Jul-13	5	\$117	\$2	\$119
Aug-13	0	\$208	\$0	\$208
Sep-13	0	\$116	\$0	\$116
Oct-13	16	\$121	\$9	\$130
Nov-13	457	\$4,752	\$237	\$4,989
Dec-13	2,828	\$4,118	\$1,508	\$5,626
Jan-14	5,152	\$4,239	\$2,993	\$7,232
Feb-14	6,032	\$2,248	\$4,057	\$6,305
Totals/Average	18,663	\$22,118	\$10,900	\$33,018

Average Delivery Rate	\$1.19 /Therm
Average Supply Rate	\$0.58 /Therm
Average Rate	\$1.77 /Therm

*Supplier Cost is based on average aggregated cost

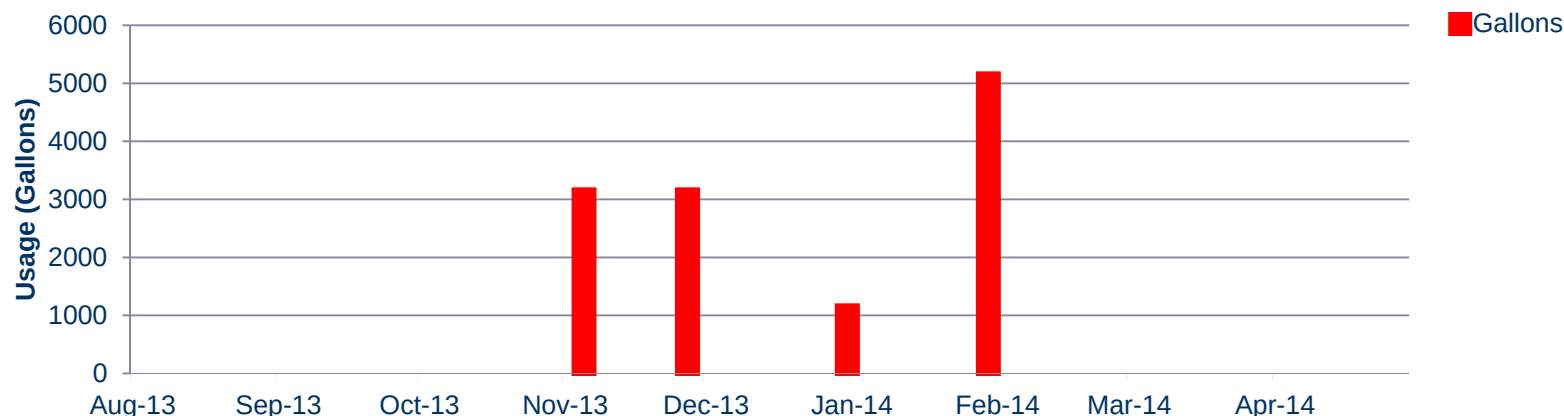
GSG: General Gas Service

This account has unusual delivery charges on Mar-03 and Nov-03. These charges significantly increase the annual average cost of natural gas delivered to this facility. This may be caused due to imbalances between the payments versus deliveries. It is recommended to review and reconcile this account.



Historic Energy Consumption (cont'd)

Waste Water Treatment Plant (Wet & Dry Phase) – Oil (2013-2014)



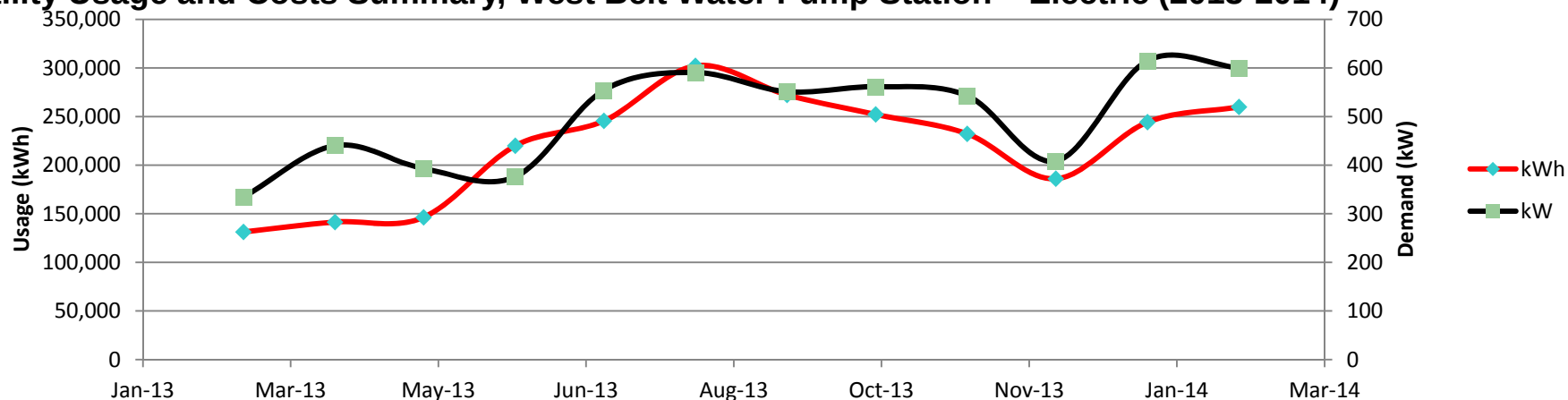
WASTE WATER TREATMENT PLANT - ELECTRIC USAGE SUMMARY				
Utility Provider	Allied Oil LLC			
Account Numbers	3 07 55 508 070			
Meter Numbers	Oil #2			
Rate				
Third Party Supplier		Account #		
Month	Usage kWh	Delivery Cost	Supply Cost	Total Cost
Mar-13	0	\$0	\$0	\$0
Apr-13	0	\$0	\$0	\$0
May-13	0	\$0	\$0	\$0
Jun-13	0	\$0	\$0	\$0
Jul-13	0	\$0	\$0	\$0
Aug-13	0	\$0	\$0	\$0
Sep-13	0	\$0	\$0	\$0
Oct-13	0	\$0	\$0	\$0
Nov-13	3,000	\$8,630	\$0	\$8,630
Dec-13	3,000	\$6,468	\$0	\$6,468
Jan-14	2,000	\$6,505	\$0	\$6,505
Feb-14	7,000	\$22,641	\$0	\$22,641
Totals/Average	15,000	\$44,243	\$0	\$44,243

Average Delivery Rate	\$2.95 /Gallon
Average Supply Rate	-
Average Rate	\$2.95 /Gallon



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, West Belt Water Pump Station – Electric (2013-2014)



WEST BELT WATER PUMP STATION - ELECTRIC USAGE SUMMARY					
Utility Provider	Public Service Electric Gas Company (PSEG)				
Account Numbers	42 172 502 07				
Meter Numbers	778008956				
Rate	LPLS				
Third Party Supplier	YES		Account #	-	
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost*	Total Cost
Mar-13	131,328	334	\$5,257	\$15,030	\$20,288
Apr-13	141,505	440	\$5,920	\$16,726	\$22,646
May-13	146,304	393	\$5,888	\$16,844	\$22,732
Jun-13	219,921	376	\$7,900	\$17,154	\$25,055
Jul-13	245,538	554	\$14,330	\$19,187	\$33,517
Aug-13	302,171	591	\$16,488	\$23,597	\$40,085
Sep-13	272,288	551	\$15,044	\$21,239	\$36,283
Oct-13	252,187	561	\$14,469	\$19,671	\$34,141
Nov-13	232,258	543	\$9,331	\$18,157	\$27,488
Dec-13	186,007	408	\$7,453	\$14,509	\$21,962
Jan-14	244,195	615	\$9,946	\$19,048	\$28,994
Feb-14	259,878	600	\$9,997	\$19,306	\$29,304
Totals/Average	2,633,580	497	\$122,023	\$220,470	\$342,493

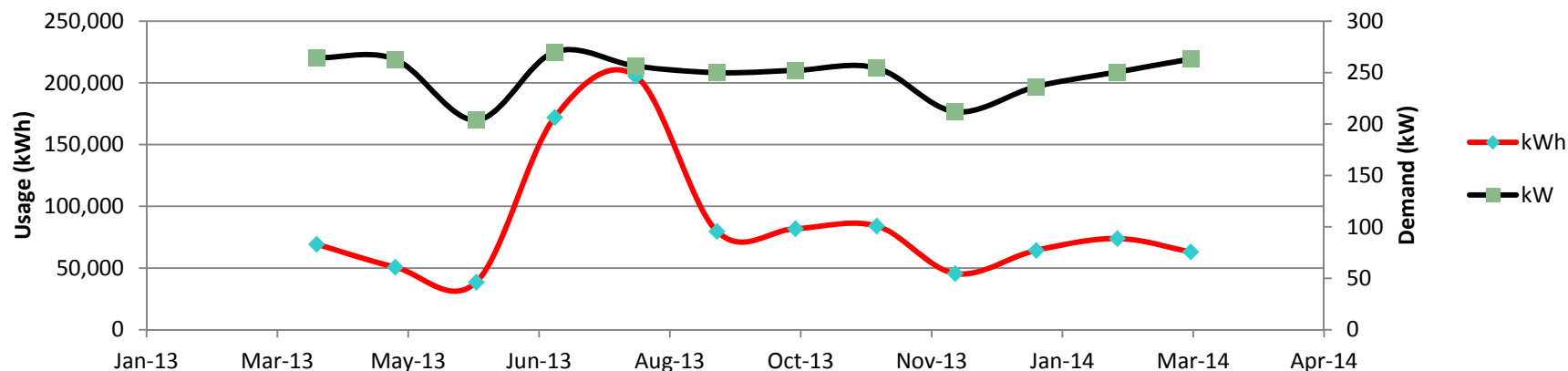
Average Delivery Rate	\$0.05 /kWh
Average Supply Rate	\$0.08 /kWh
Average Rate	\$0.13 /kWh
Annual Peak Demand	615 kW

*Supplier Cost is based on average aggregated cost
LPLS: Large Primary Lighting Secondary Service



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, Wanaque Water Pump Station – Electric (2013-2014)



WANAQUE WATER PUMP STATION - ELECTRIC USAGE SUMMARY					
Utility Provider	Jersey Central Power & Light (JCP&L)				
Account Numbers	100 008 853 002				
Meter Numbers	G15076173				
Rate	General Service				
Third Party Supplier	Hess Corporation	Account #	-		
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost	Total Cost
Apr-13	69,320	264	\$2,855	\$8,194	\$11,049
May-13	50,760	263	\$2,538	\$5,844	\$8,382
Jun-13	38,560	204	\$2,051	\$3,008	\$5,058
Jul-13	172,120	270	\$4,717	\$13,450	\$18,167
Aug-13	205,400	256	\$5,172	\$16,040	\$21,211
Sep-13	79,720	250	\$3,050	\$6,218	\$9,269
Oct-13	81,880	252	\$3,046	\$6,387	\$9,433
Nov-13	84,040	254	\$3,042	\$6,570	\$9,612
Dec-13	45,560	212	\$2,383	\$3,554	\$5,937
Jan-14	64,320	236	\$2,569	\$5,017	\$7,586
Feb-14	73,880	251	\$2,740	\$5,489	\$8,229
Mar-14	63,080	263	\$2,658	\$4,686	\$7,345
Totals/Average	1,028,640	248	\$36,821	\$84,456	\$121,277

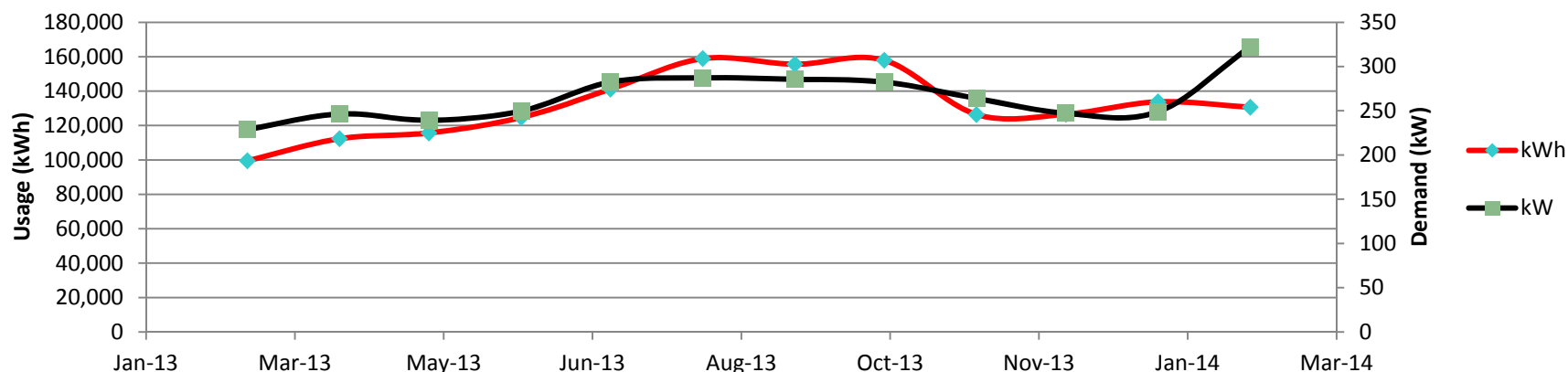
Average Delivery Rate	\$0.04 /kWh
Average Supply Rate	\$0.08 /kWh
Average Rate	\$0.12 /kWh
Annual Peak Demand	270 kW

*Supplier Cost is based on average aggregated cost



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, Jacobus Water Pump Station – Electric (2013-2014)



JACOBUS WATER PUMP STATION - ELECTRIC USAGE SUMMARY					
Utility Provider	Public Service Electric Gas Company (PSEG)				
Account Numbers	42 174 001 01				
Meter Numbers	778013000				
Rate	LPLS				
Third Party Supplier	YES	Account #	-		
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost*	Total Cost
Mar-13	99,520	229	\$3,988	\$11,390	\$15,378
Apr-13	112,320	246	\$4,411	\$13,277	\$17,687
May-13	115,680	239	\$4,480	\$13,318	\$17,798
Jun-13	124,640	250	\$6,937	\$9,722	\$16,659
Jul-13	141,120	282	\$7,900	\$11,028	\$18,928
Aug-13	158,880	287	\$8,527	\$12,407	\$20,934
Sep-13	155,600	286	\$8,409	\$12,137	\$20,546
Oct-13	157,920	282	\$6,148	\$12,318	\$18,466
Nov-13	126,400	264	\$5,137	\$9,881	\$15,019
Dec-13	126,560	247	\$5,082	\$9,872	\$14,954
Jan-14	133,760	249	\$5,222	\$10,434	\$15,656
Feb-14	130,640	322	\$5,285	\$9,705	\$14,990
Totals/Average	1,583,040	265	\$71,526	\$135,489	\$207,016

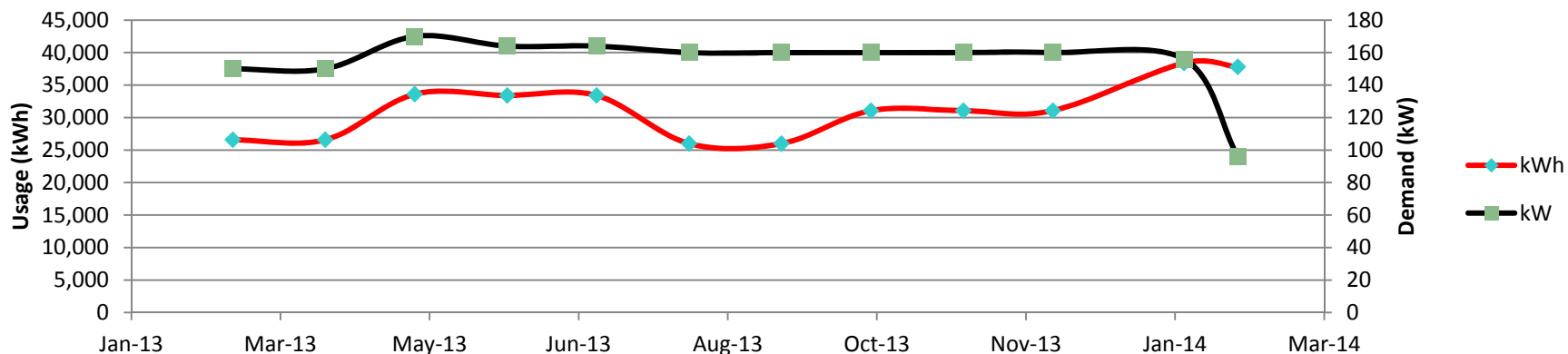
Average Delivery Rate	\$0.05 /kWh
Average Supply Rate	\$0.09 /kWh
Average Rate	\$0.13 /kWh
Annual Peak Demand	322 kW

*Supplier Cost is based on average aggregated cost
LPLS: Large Primary Lighting Secondary Service



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, Lower Preakness Sewer Pump Station– Electric (2013-2014)



LOWER PREAKNESS SEWER PUMP STATION - ELECTRIC USAGE SUMMARY					
Utility Provider	Public Service Electric Gas Company (PSEG)				
Account Numbers	42 142 024 06				
Meter Numbers	778011557				
Rate	LPLS				
Third Party Supplier	YES	Account #	-		
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost	Total Cost
Mar-13	26,578	150	\$1,450	\$3,042	\$4,492
Apr-13	26,578	150	\$1,450	\$3,142	\$4,592
May-13	33,600	170	\$1,891	\$3,868	\$5,759
Jun-13	33,400	164	\$3,346	\$2,605	\$5,951
Jul-13	33,400	164	\$3,346	\$2,610	\$5,955
Aug-13	26,000	160	\$2,732	\$2,030	\$4,762
Sep-13	26,000	160	\$2,732	\$2,028	\$4,760
Oct-13	31,067	160	\$1,881	\$2,423	\$4,305
Nov-13	31,067	160	\$1,881	\$2,429	\$4,310
Dec-13	31,067	160	\$1,881	\$2,423	\$4,305
Jan-14	38,400	156	\$2,076	\$2,995	\$5,072
Feb-14	37,800	96	\$1,805	\$2,808	\$4,613
Totals/Average	374,956	154	\$26,470	\$32,404	\$58,875

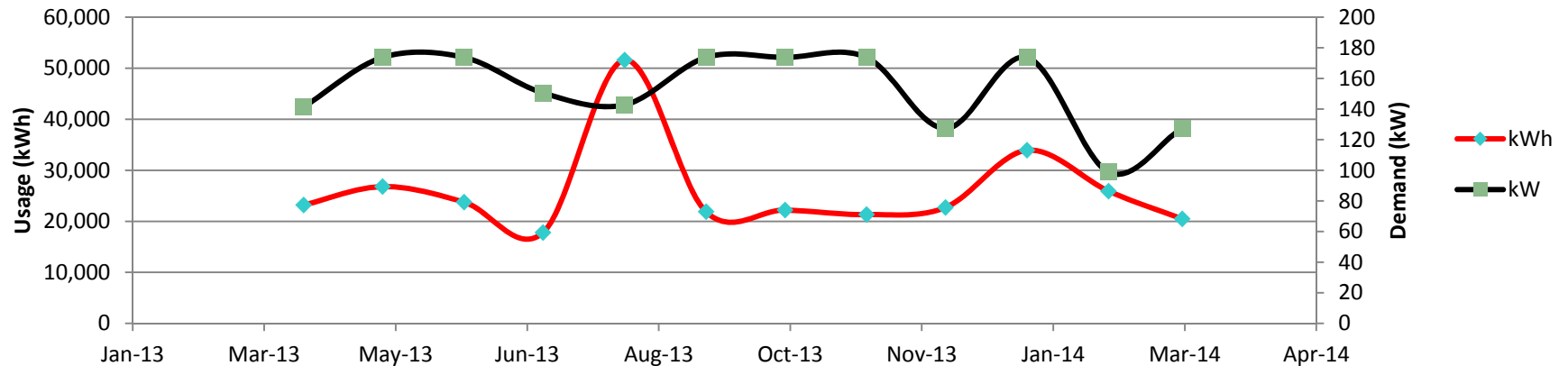
Average Delivery Rate	\$0.07 /kWh
Average Supply Rate	\$0.09 /kWh
Average Rate	\$0.16 /kWh
Annual Peak Demand	170 kW

*Supplier Cost is based on average aggregated cost
LPLS: Large Primary Lighting Secondary Service



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, Sheffield Sewer Pump Station– Electric (2013-2014)



SHEFFIELD SEWER PUMP STATION - ELECTRIC USAGE SUMMARY					
Utility Provider	Jersey Central Power & Light (JCP&L)				
Account Numbers	100 006 793 424				
Meter Numbers	S309585669				
Rate	General Service				
Third Party Supplier	Hess	Account #	-		
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost*	Total Cost
Apr-13	23,200	141	\$1,443	\$2,742	\$4,186
May-13	26,800	174	\$1,024	\$3,085	\$4,109
Jun-13	23,760	174	\$978	\$1,853	\$2,832
Jul-13	17,800	151	\$1,338	\$1,391	\$2,729
Aug-13	51,600	143	\$1,842	\$4,029	\$5,871
Sep-13	21,880	174	\$947	\$1,707	\$2,654
Oct-13	22,200	174	\$949	\$1,732	\$2,680
Nov-13	21,320	174	\$936	\$1,667	\$2,602
Dec-13	22,720	127	\$1,201	\$1,772	\$2,973
Jan-14	33,920	174	\$1,675	\$2,646	\$4,321
Feb-14	25,920	99	\$1,031	\$1,926	\$2,957
Mar-14	20,480	127	\$1,133	\$1,521	\$2,655
Totals/Average	311,600	153	\$14,498	\$26,072	\$40,569

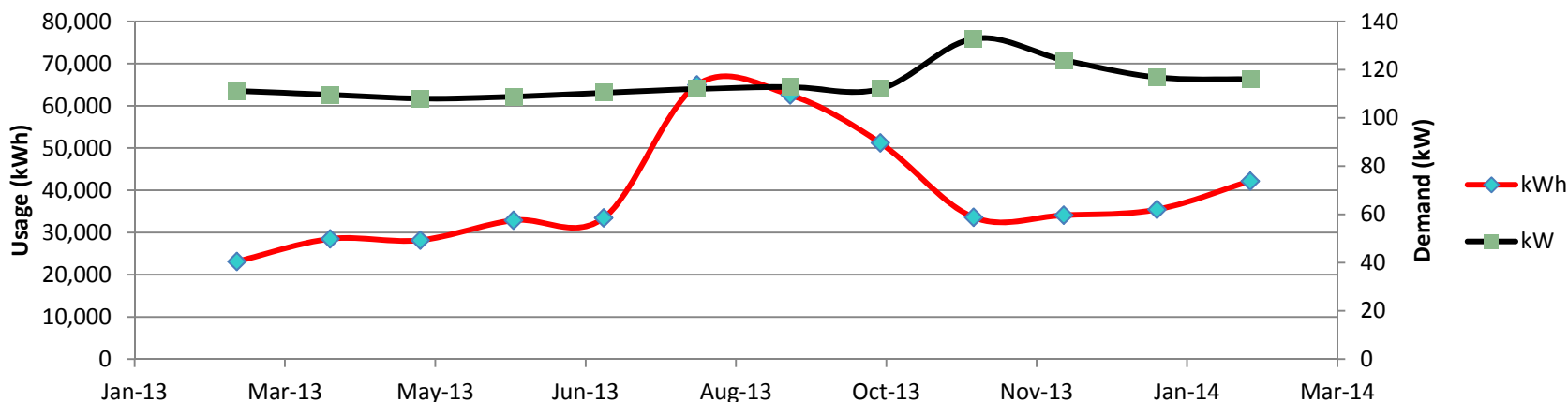
Average Delivery Rate	\$0.05 /kWh
Average Supply Rate	\$0.08 /kWh
Average Rate	\$0.13 /kWh
Annual Peak Demand	174 kW

*Supplier Cost is based on average aggregated cost



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, Alps Road Sewer Pump Station– Electric (2013-2014)



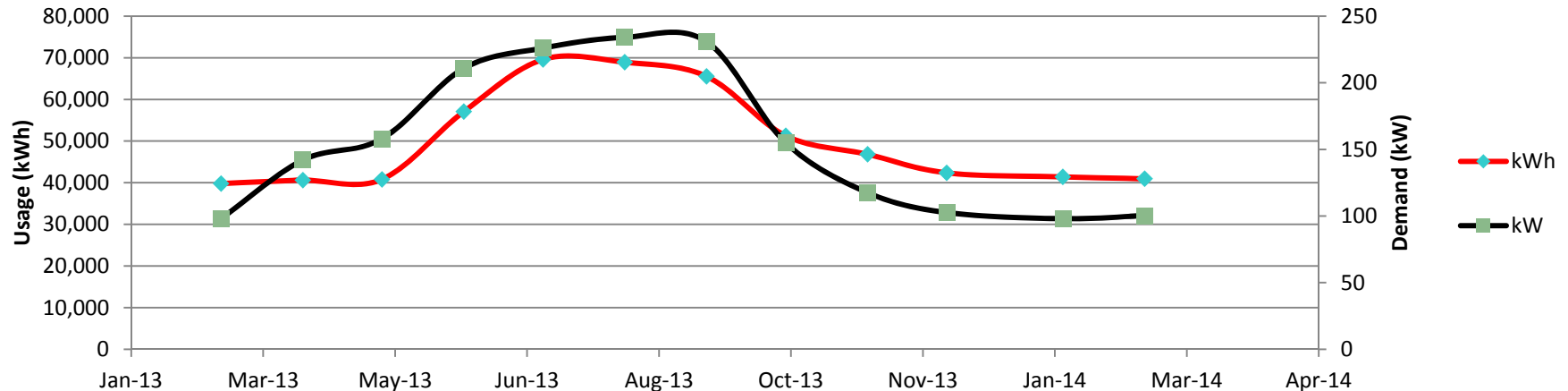
ALPS ROAD SEWER PUMP STATION - ELECTRIC USAGE SUMMARY					
Utility Provider	Public Service Electric Gas Company (PSEG)				
Account Numbers	42 173 001 07				
Meter Numbers	778015695				
Rate	LPLS				
Third Party Supplier	YES		Account #	-	
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost*	Total Cost
Mar-13	23,120	111	\$1,420	\$2,646	\$4,066
Apr-13	28,480	110	\$1,565	\$3,366	\$4,931
May-13	28,160	108	\$1,550	\$3,242	\$4,792
Jun-13	32,880	109	\$2,639	\$2,565	\$5,204
Jul-13	33,440	110	\$2,706	\$2,613	\$5,319
Aug-13	64,960	112	\$3,676	\$5,073	\$8,749
Sep-13	62,560	113	\$3,600	\$4,880	\$8,479
Oct-13	51,200	112	\$2,319	\$3,994	\$6,313
Nov-13	33,600	133	\$1,862	\$2,627	\$4,489
Dec-13	34,080	124	\$1,846	\$2,658	\$4,504
Jan-14	35,440	117	\$1,836	\$2,764	\$4,600
Feb-14	42,160	116	\$2,002	\$3,132	\$5,134
Totals/Average	470,080	115	\$27,020	\$39,560	\$66,580

Average Delivery Rate	\$0.06 /kWh
Average Supply Rate	\$0.08 /kWh
Average Rate	\$0.14 /kWh
Annual Peak Demand	133 kW

*Supplier Cost is based on average aggregated cost
LPLS: Large Primary Lighting Secondary Service

Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, Wayne Public Library – Electric (2013-2014)



WAYNE PUBLIC LIBRARY - ELECTRIC USAGE SUMMARY					
Utility Provider	Public Service Electric Gas Company (PSEG)				
Account Numbers	42 172 004 04				
Meter Numbers	9198526				
Rate	LPLS				
Third Party Supplier	HESS		Account #	-	
Month	Usage kWh	Demand kW	Delivery Cost	Supply Cost*	Total Cost
Mar-13	39,800	98	\$1,843	\$4,555	\$6,398
Apr-13	40,600	142	\$2,021	\$4,799	\$6,820
May-13	40,800	158	\$2,083	\$4,697	\$6,781
Jun-13	57,073	211	\$4,249	\$4,452	\$8,701
Jul-13	69,600	226	\$5,181	\$5,439	\$10,620
Aug-13	68,934	234	\$5,132	\$5,383	\$10,515
Sep-13	65,539	231	\$4,879	\$5,112	\$9,991
Oct-13	51,282	155	\$2,374	\$4,000	\$6,374
Nov-13	46,823	118	\$2,168	\$3,660	\$5,828
Dec-13	42,365	103	\$1,961	\$3,305	\$5,266
Jan-14	41,401	98	\$1,917	\$3,229	\$5,146
Feb-14	40,941	100	\$1,895	\$3,041	\$4,937
Totals/Average	605,159	156	\$35,703	\$51,673	\$87,377

Average Delivery Rate	\$0.06 /kWh
Average Supply Rate	\$0.09 /kWh
Average Rate	\$0.14 /kWh
Annual Peak Demand	234 kW

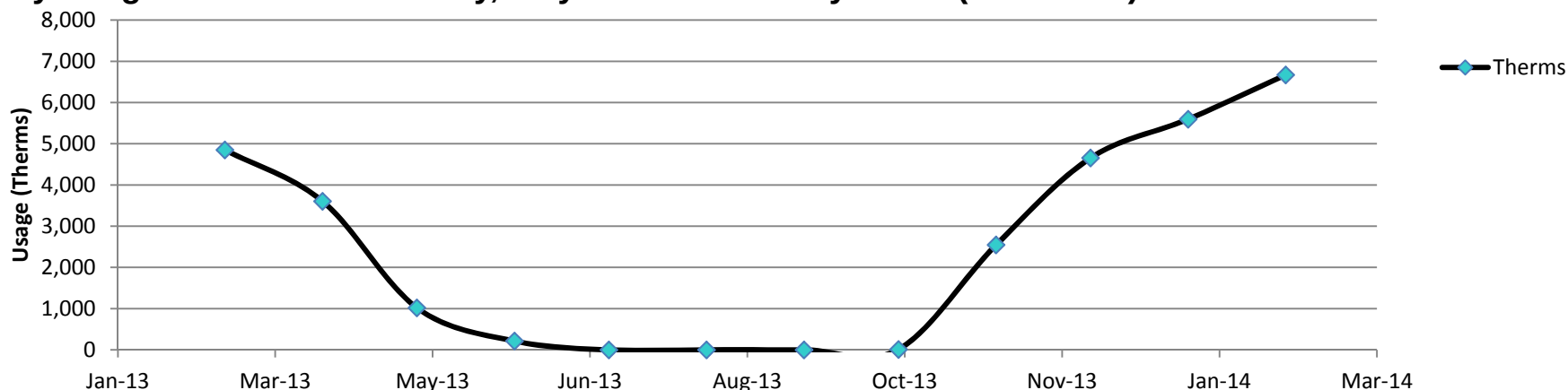
Estimated values used where italic

LPLS: Large Primary Lighting Secondary Service



Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary, Wayne Public Library – Gas (2013-2014)



WAYNE PUBLIC LIBRARY - NATURAL GAS USAGE SUMMARY				
Utility Provider	Public Service Electric Gas Company (PSEG)			
Account Number	42 172 004 04		Meter #	2283217
Rate	LVG		LVG	
Third Party Supplier	HESS	Account #	N/A	
Month	Usage Therms	Delivery Cost	Supply Cost*	Total Cost
Mar-13	4,851	\$1,927	\$2,429	\$4,356
Apr-13	3,605	\$522	\$1,775	\$2,297
May-13	1,019	\$247	\$561	\$807
Jun-13	214	\$134	\$118	\$252
Jul-13	0	\$104	\$0	\$104
Aug-13	0	\$104	\$0	\$104
Sep-13	0	\$106	\$0	\$106
Oct-13	10	\$170	\$6	\$176
Nov-13	2,546	\$993	\$1,321	\$2,314
Dec-13	4,655	\$1,815	\$2,482	\$4,297
Jan-14	5,595	\$2,182	\$3,251	\$5,433
Feb-14	6,669	\$2,601	\$4,485	\$7,085
Totals/Average	29,164	\$10,906	\$16,426	\$27,333

Average Delivery Rate	\$0.37 /Therm
Average Supply Rate	\$0.56 /Therm
Average Rate	\$0.94 /Therm

Usage estimated based on delivery cost (*italic*)

* Supplier cost based on average aggregated cost

LVG: Large Volume Gas Service



Portfolio Manager / Energy Star

ENERGY STAR SCORES

- *Energy Star* Scores are calculated to establish a facility-specific energy intensity baseline.
- *Energy Star* can be used to compare energy consumption to other similar facilities and to gauge the success of energy conservation and cost containment efforts.
- Buildings with an *Energy Star* rating/score of 75 or above are eligible to apply for an official *Energy Star* Building label.

Facility Name	Total Floor Area (sq./ft.)	Energy Star Score	Eligible to Apply for	Current Site Energy Intensity	Current Source Energy Intensity	Average Site EUI by Building Type	Utility Cost (\$/sq.ft.)			
							Gas	Oil	Electric	Total
Municipal Building/Police Dept.	58,400	65	NO	112	234.5	134.2	\$0.53	-	\$2.30	\$2.83
Public Library	37,800	n/a	NO	132	247.5	122.1	\$0.72	-	\$2.31	\$3.03
Mountain View WPCF	83,980	n/a	NO	207	619.9	n/a	\$0.39	\$0.53	\$6.77	\$7.69
DPW Garage	30,600	n/a	NO	82	135.6	59.6	\$0.56	-	\$1.10	\$1.65
West Belt Water Pump Station	3,000	n/a	NO	2997	9,405.10	n/a	-	-	\$114	\$114
Wanaque Water Pump Station	800	n/a	NO	4390	13,599.40	n/a	-	-	\$152	\$152
Jacobus Water Pump Station	2,200	n/a	NO	2457	7,696.70	n/a	-	-	\$94	\$94
Lower Preakness Sewer Pump Station	2,200	n/a	NO	582	1,823.80	n/a	-	-	\$27	\$27
Sheffield Sewer Pump Station	2,000	n/a	NO	532	1,646.40	n/a	-	-	\$20	\$20
Alps Road Water Pump Station	2,200	n/a	NO	729	2,286.40	n/a	-	-	\$30	\$30

- *Neither facility is eligible to receive an Energy Star Score at this time due to facility type. Nevertheless, the building EUI (Energy Use Intensity) can be utilized as a benchmarking tool for comparing the energy consumption of each.*



Portfolio Manager / Energy Star (cont'd)

Portfolio Manager Sign-In

- An account has been created for Wayne Township in Portfolio Manager. You should have received an email to notify you of the generation of this account and shared access with Dome-Tech.
- Now that the report has been finalized, you have full access to use/edit the information and change/update it as necessary.
- Website link to sign in:
- <http://www.energystar.gov/portfoliomanager>





Facility Information – Municipal Building

Building Name:

Municipal Building and Police Station

Address:

475 Valley Road
Wayne, NJ 07470

Gross Floor Area:

58,400 sq. ft.

Year Built:

1960

Renovations:

Health Center was built in 1964.
Additions and Alterations were done in 1975.

of Occupants:

150 full time employees (Est*)

Building Usage:

The Municipal Building houses government branches including the town clerk, mayor's office, taxation, health center, administration, fire department, finance department, the township court, and the police department.

The operating hours are between 8:30 am and 4:30 pm, Monday through Friday. No weekend usage, except the police department. The police department is open 24 hours a day and 7 days a week.

Average occupancy: 40 hours per week (Police Department 24/7)



Facility Information – Municipal Building

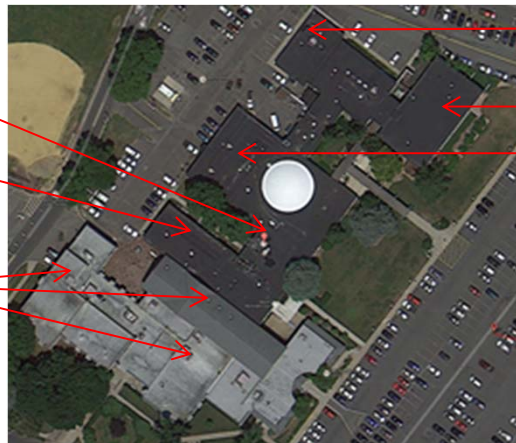
Construction Features:

- Façade:** The building façade consists of light-colored 4” brick veneer in good condition.
- Roof Type:** Built-up flat roof with slightly pitched sections.
The Health and the Violations Department roofs were installed in 2013. The rest of the building’s roof was upgraded in 1987. Estimated 2” insulating foam with EPDM membrane cover.
- Windows:** Covering approximately 25% of façade, both fixed and operable aluminum frame windows, mostly double pane glass, in fair condition.
The windows in the back of the building are in poor condition with significant draft issues. These windows require air sealing.
- Exterior Doors:** Approximately fourteen (14) sets of doors, aluminum frame with a mixture of double pane glass and opaque doors, in good condition. Some doors need air sealing.

Violations Department

Health Department

Library



Police Department

Administration Building

Engineering and Planning
Departments



Facility Information – Municipal Building

Major Mechanical Systems

Heating Ventilation and Air Conditioning - HVAC

- Space conditioning for the Wayne Township Municipal Building is provided with a variety of packaged rooftop units and split air conditioning units.
- Two Carrier rooftop A/C units (10 and 18 Ton) serve various Police Department Offices. The units were installed in 1999 and appear to be in fair condition.
- 1 split AC unit serves the Evidence Room (Carrier 5 Ton, 1995, poor condition)
- 1 split AC unit serves the Records Department (York 4 Ton, 2013, good condition, runs 24/7)
- AC-8: Split unit serves the NE Hallways (Carrier 10 Ton, 1996, fair condition)
- 1 Packaged RTU serves the Parks Dept (York, 5 Ton, 2002, good condition)
- 1 Packaged RTU serves the Eng. GIS Dept. (York, 5 Ton, 2002, good condition)
- AC-6: Split unit serves the Engineering Department (Carrier 10 Ton, 1995, fair condition)
- AC-7: Split unit serves the Building and Planning Department (Carrier 7.5 Ton, 1995, fair condition)
- AC-9: Split unit serves the Taxation Department (Carrier 5 Ton, 1995, fair condition)
- AC-5: Split unit serves the Treasury (Carrier 8.5 Ton, 1995, fair condition)
- 1 split unit serves the Courtroom and Council Room (York 15 Ton (est), 2013, good condition)
- 1 split unit serves the Violations Department (York, 7.5 Ton, 2003, good condition)
- 2 Window AC units serve OEM Offices. The units are old but appear to be in good working condition.
- 1 PTAC unit serves a space in the Public Works Office.



Facility Information – Municipal Building

Major Mechanical Systems

Heating Ventilation and Air Conditioning - HVAC

- CU-3&4: Split units serve Health Department (Carrier, 3 Ton, 1996, fair condition)
- 1 ductless split unit serves the Health Department mail room (Mitsubishi 0.75 Ton, 1996-Est, fair condition)
- CU-1: Split unit serves the Health Department (Carrier, 3.5 Ton, 1996, fair condition)
- CU-2: Split unit serves the Health Department (ICP, 3 Ton, 2009, good condition)
- 1 ductless split unit serves the Computer/TV room in the Health Dept. (Mitsubishi 1.5 Ton, 2005-Est, good condition)
- 1 ductless split unit serves the Fire Bureau (Sanyo, 1 Ton, 1996-Est, fair condition)
- 1 ductless split unit serves the Health Dept. (Carrier, 1 Ton, 1996-Est, fair condition)
- 1 ductless split unit serves the Health Dept. (Sanyo, 3 Ton, 1991-Est, fair condition)
- 1 large split AC unit serves the Township Administration offices (Trane, 40 Ton, 2010, good condition)
- 1 ductless split unit serves the telephone room. (Sanyo, 2 Ton, 2007, good condition)
- 1 split AC unit serves Police Dispatch (Trane, 10 Ton, 2009, good condition)
- 1 ductless split AC unit serves as a Radio Room backup unit (Sanyo, 1.5 Ton, 2000-est, good condition)
- AC-1: Split unit serves Meeting Room #2 (Trane, 7.5 Ton, 2007, good condition)
- AC-2: Split unit serves Computer Room 24/7 (Carrier, 10 Ton, 2008, good condition)
- 1 split AC unit serves as a backup for the Computer Room (Luxaire, 5 Ton, 2000, good condition)
- 1 split AC unit serves as a backup for the Computer Room (EMI, 4 Ton, 2000-est, good condition)
- 1 split AC unit serves the OEM room (Lennox, 2.5 Ton, 1997, good condition)



Facility Information – Municipal Building

Major Mechanical Systems

Heating Systems

- Perimeter heating is provided by two (2) boilers that are located in the Health Department Basement and the Boiler Room near the Council Chamber.
- The Health Department basement houses a Weil McLain natural gas fired sectional boiler that is rated at 1,378 MBH input capacity with 81% efficiency. The manufacturing date is 2012.
- Hot water is circulated throughout the corresponding spaces via pipe-mounted 3/4 HP pumps.
- A gas-fired Pacific fire-tube boiler is located in the Boiler Room of the Council Chamber. It is rated at 3,040 MBH input capacity with a manufacturing date of 1959.
- Similarly, hot water is circulated via multiple pipe-mounted hot water circulators in the lower level.
- Room 218 (a meeting room) and the Parks & Recreation Department have fin tube radiator heating.

Domestic Hot Water

- Domestic Hot Water is provided by two (2) 50 gallon electric water heaters.
- The hot water heaters mainly serve the bathrooms.



Facility Information – Municipal Building

Major Mechanical Systems

Controls

- Currently there is no central Building Automation System in this facility.
- The air conditioning units are controlled via a mixture of local thermostats.
- Some of these thermostats are programmable digital thermostats while others are conventional mercury bulb type mechanical thermostats.
- All of the ductless split units are locally controlled via portable thermostats.
- The OEM Control Room, Treasurer Office (2 AC units) and several other spaces are controlled via pneumatic thermostats.
- Boiler control valve actuators appear to be pneumatic but the valves don't appear to function properly.
- A process air compressor runs 24/7 providing air for the pneumatic control systems.
- Some of the general exhaust fans are on timers, while others are on manual switches.





Facility Information – Wayne Public Library

Building Name:

Wayne Public Library

Address:

475 Valley Road

Wayne, NJ 07470

Gross Floor Area:

37,554 sq. ft.

Year Built:

1964, with an expansion in 1971 and 1972. Renovations in 2001.

Occupants:

75 (Est*)

Building Usage:

The operating hours are between 8:30 am and 4:30 pm Monday through Friday.
No weekend usage.

Average occupancy: 40 hours per week

Construction Features:

Façade:

The Library consists of light-colored 8" brick veneer in good condition.

Roof Type:

Flat, with slightly pitched sections. Grey in color. The roof consists of EPDM and gravel.

Windows:

Covering 25% of façade, both fixed and operable aluminum frame, double pane windows, in good condition.

Exterior Doors:

Approximately ten (10) exterior doors with a mixture of aluminum frame with double pane glass, and opaque doors, in good condition. There is one large overhead door opening at the loading dock.



Facility Information – Wayne Public Library

Major Mechanical Systems

Heating Ventilation and Air Conditioning - HVAC

- HVAC is provided to this facility via nine (9) packaged rooftop units and five (5) split air conditioning units.
- RTU #1 serves the Upstairs Library and Seating Area (25 Tons, Carrier, 1999, fair condition).
- RTU #2 serves the Upstairs Library and Seating Area (17.5 Ton, Trane, 2012, good condition).
- RTU #3 serves the main section of the Library (12 Ton, Carrier, 1999, fair condition).
- RTU #4 serves the Children's Room (25 Ton, Carrier, 1999, fair condition).
- RTU #5 serves Meeting Rooms A&B (25 Ton, Carrier, 1999, fair condition).
- RTU #6 serves the front section of the Library (20 Ton, Carrier, 1999, fair condition).
- RTU #7 serves the back offices (5 Ton, Carrier, 1989, poor condition).
- RTU #8 serves the Library Garage (~20 Ton, Trane, nameplate was erased, good condition).
- RTU #9 serves main section of the Library (12 Ton, Carrier, 1999 fair condition).
- CU-1 through CU-5: split units serve the office spaces (Mitsubishi Mr. Slim, 3 Ton each, estimated 10 years old).
- All RTU units are equipped with 100% outside air functionality.
- Loading dock and storage area is heated with hot water unit heaters.

Facility Information – Wayne Public Library

Major Mechanical Systems

Heating Systems

- All rooftop units are equipped with gas preheat coils.
- Some offices on the second floor of the Library are heated with hot water baseboard heaters.
- The building is served by one (1) gas fired sectional Crown Hot Water Boiler with an efficiency of 80%.
- Heating input capacity is 800 MBH. The boiler was manufactured in 1999 and is in fair condition.
- Hot water is circulated throughout the perimeter via multiple pipe mounted circulators.

Domestic Hot Water

- Domestic Hot Water (DHW) is provided by one (1) 30 gallon electric hot water heater.
- The hot water heater serves faucets in the bathrooms and lunchroom.

Controls

- Currently there is no Building Automation System in this building.
- Rooftop units are controlled via local digital thermostats.
- The Library's Southwest area is heated by fin tube hot water radiators.





Facility Information – DPW Garage

Facility Name:

DPW Garage

Address:

201 Dey Rd
Wayne, NJ 07470

Gross Floor Area:

30,600 sq. ft.

Year Built:

1967 with an addition in 1997

Occupants:

30 (Est*)

Building Usage:

The building contains offices, vehicle maintenance bays, and storage for supplies and materials. Regular operating hours are between 7:30 am and 3:30 pm, Monday through Friday. The facility is closed on weekends, except for during emergencies.

Average occupancy:

8 hours per day, 40 hours per week.

Construction Features:

Façade:

Garage building has concrete block walls with partial metal siding, in good condition. The office building has frame walls with vinyl siding.

Roof Type:

Flat, with slightly pitched sections. Grey in color. The roof consists of EPDM and 2" board insulation.

Windows:

Office building has windows with both fixed and operable aluminum framed double pane windows, in good condition. Garage structure has minimal windows.

Exterior Doors:

There are approx. nineteen (19) roll-up type bay doors of two different sizes. There are approx. six (6) standard entry doors. Bay doors have large gaps and infiltration issues.



Facility Information – DPW Garage

Major Mechanical Systems

Heating Ventilation and Air Conditioning - HVAC

- Two (2) Lennox Split AC units serve the front offices as well as the hallways (1998, good condition).
- Two (2) gas unit heaters serve the Water Department Garage.
- Eleven (11) gas unit heaters serve the Main Garage (Road Department).
- Two (2) Reznor MUAs (make-up air units) replenish ventilation air in the garage (~2000, good condition).
- One (1) RTU serves the Lunch Room. The unit is located on the roof and was not accessible.
- One (1) ductless split serves the Equipment Maintenance Office (Sanyo, 2 Ton, 2003, fair condition).
- One (1) ductless split dedicated to Equipment Former's Office (Sanyo, 2 Ton, 2003, fair condition).
- One (1) ductless split serves the Road Former's Office (Mitsubishi – Mr. Slim, age not identified, fair condition).



Facility Information – DPW Garage

Major Mechanical Systems

Domestic Hot Water

- Domestic Hot Water (DHW) is provided to the front offices via an electric water heater in good condition.
- Domestic Hot Water (DHW) is provided to the garage area via an electric 80 gallon A.O. Smith water heater. This unit serves the bathroom sinks only. The facility uses a minimal amount of hot water.



Controls

- Currently there is no Building Automation System in this facility.
- The AHUs serving the front offices are controlled via local digital thermostats. There are balancing issues in the ductwork which cause overheating and overcooling issues.
- The unit heaters are on mercury bulb type mechanical thermostats.
- The exhaust fans in the Garage are also on manual switches.
- Ductless split AC units and the lunchroom rooftop unit are controlled via local digital thermostats.





Facility Information – Mountain View (Wet Phase)

Facility Name:

Mountain View Water Pollution Control Facility (Wet Phase)

Address:

205 Dey Rd
Wayne, NJ 07470

Water Treatment Capacity:

13.5 mgd (million gallons/day)

Gross Floor Area:

36,730 sq. ft.

Year Built:

1982

Occupants:

30 (Est*)

Rated Capacity:

13.5 MGD

Facilities:

Includes settling tanks, equalization basin, aeration basins, chlorination facilities, sludge pumping, thickening and transportation.

The facility also includes a main service building, chlorine storage building and two smaller buildings for maintenance and storage.

Construction Features:

Tanks:

Concrete structures with adjacent covered spaces housing pumps and other process equipment.

Service Building:

Concrete block walls with brick façade. Two main entry points.

Chlorine Building:

Concrete block walls with brick façade. Three main entry points.



Facility Information – Mountain View (Wet Phase)

Process Systems

Thickener Building

- The Thickener Building consists of 4 thickener tanks and 1 sludge holding tank.
- Thickener tanks have four (4) 15 HP rakes while the sludge holding tank has a 25 HP rake which is on VFD.
- Each tank has a 2 HP odor control fan.
- The thickener sub-level houses 6 x 7.5 HP positive displacement thickener pumps (One on VFD).
- The building also houses 2 x 15 HP double disk thickener effluent pumps (Both on VFD).
- 2 x 10 HP sludge transfer pumps transfer sludge to trucks.
- There are two (2) 3 HP positive displacement thickener sump pumps.
- A 5 HP air compressor pushes air into the sludge holding tank.

HVAC and Hot Water

- The building is heated with electric unit heaters.
- There is a small electric hot water heater serving the utility sinks in the main level.





Facility Information – Mountain View (Wet Phase)

Process Systems

Driver Dispatch Cabin

- A small cabin (~250 SF) is utilized as the driver dispatch room and resting area.
- The building is heated with electric unit heaters and conditioned with a window air conditioner.

Old Electrical Shop

- A small cinder block building (~1000 SF) is utilized as electrical equipment storage.
- The building is heated with electric unit heaters.

Maintenance and Storage Building

- The Maintenance and Storage Building is approximately 3500 SF and houses storage bins, a workshop, and offices.
- The exterior walls are concrete blocks with a brick façade. The roof is built up with concrete decking.
- The windows have single pane glass with metal frames.
- The building is heated with hot water unit heaters. Hot water is supplied by a 137 MBH electric hot water boiler and small circulators.
- The building is also partially conditioned with two (2) window air conditioners.



Facility Information – Mountain View (Wet Phase)

Process Systems

Chlorine/Electrical Building

- This building is utilized as the storage space for chemicals used in the water treatment process such as sodium hypochlorite and sodium bisulfite.
- The building houses a mini-laboratory for materials testing.
- The building also houses two (2) x 628 MBH (input) #2 oil fired service water heaters which provide heating for the chlorine building and the spaces between the clarifiers.
- The boilers were made by Fulton (2011) and appear to be in excellent condition.
- The spaces between the clarifiers, pipe galleries, chlorine building, and adjacent spaces are heated with hot water unit heaters and heating & ventilation (HV) units.
- Hot water is circulated throughout the building via two (2) 7.5 HP constant volume pumps with standard efficiency motors.
- The building houses an oil fired diesel emergency backup generator. The generator is periodically started/stopped as required.
- The post-aeration room houses two (2) 40 HP centrifugal air compressors, which adds air into the effluent stream.
- The chlorine contact tank prepares and supplies chlorine to the treated waste stream.
- This building is heated using hot water heating and ventilation units and unit heaters.
- Hot water is supplied to these spaces from the oil fired hot water boiler room.



Facility Information – Mountain View (Wet Phase)

Process Systems

Secondary Clarifiers and Pump Stations

- This structure houses four (4) secondary clarifiers as well as house process pumps and pipes.
 - The structure has a concrete roof which is lit with induction light fixtures.
 - There are four (4) Return Activated Sludge pumps - RAS (40 HP)
 - There are two (2) Waste Activated Sludge pumps – WAS (5 HP)
 - There are two (2) scum pumps (3 HP) and two (2) de-watering pumps (5 HP)
 - An air compressor is used for the lime system (15 HP).
 - All RAS and WAS pumps are on VFDs.
-
- This building is heated with hot water heating and ventilation units and unit heaters.
 - Hot water is supplied to these spaces from the oil fired hot water boiler room.





Facility Information – Mountain View (Wet Phase)

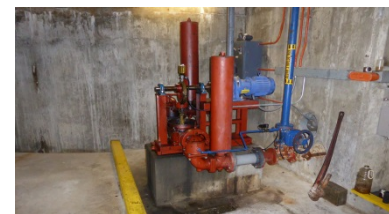
Process Systems

Primary Clarifiers and Pump Stations

- Four (4) primary Clarifier Tanks
- Four (4) Primary Sludge Pumps (15 HP)
- Four (4) Scum Transfer Pumps (3 HP)
- One sampling pump (3 HP)
- Four (4) grinders (15 HP)

Lime Room

- Three (3) Pumps (15 HP)
- 2 Mixers (7.5 HP)
- 2 Blowers (Est. 25 HP)
- This building is heated with hot water heating and ventilation units and unit heaters.
- Hot water is supplied to these spaces from the oil fired hot water boiler room.

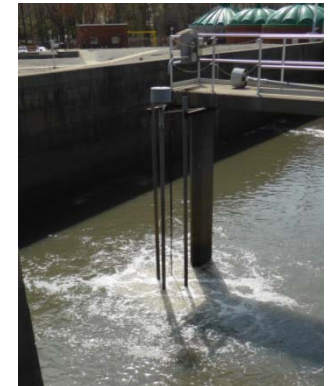


Facility Information – Mountain View (Wet Phase)

Process Systems

Aeration Tanks

- This water treatment facility has four (4) aeration tanks
- Each tank is equipped with three (3) surface aerators.
- Aerators are driven with 40 HP premium efficiency motors on VFDs.
- The aeration system is typically the single largest energy user in a waste water treatment plant.
- Surface aerators are designed to operate partially submerged in the sludge, ideally a 7 inch distance is recommended between the water surface and pump base
- Currently the level of the aerators is set manually. We recommend installation of automatic level controls.
- Surface aeration is relatively inefficient as compared to fine bubble aeration systems.



Equalization Basins

- Equalization basins normalize the hourly fluctuations in the influent flow.
- Each basin has a 40 HP submersible pump with VFDs, which pumps influent to primary clarifiers.
- Each basin is equipped with four (4) aerators (15 HP Each).
- Equalization basin control room is heated via electric unit heaters.



Facility Information – Mountain View (Wet Phase)

Process Systems

Controls

- The water treatment process systems are monitored and partially controlled by a SCADA (Supervisory Control Active Data Acquisition) system.
- It was reported and observed that many of the process controls are set manually at the equipment level.
- Aeration tank levels are manually maintained, which has a tremendous impact on the energy consumption and performance of the aeration systems.
- Many of the pumps are coupled with variable frequency drives. Many of these are set manually to a predetermined frequency instead of modulating based on a performance parameter.

Major HVAC Systems

Controls

- There is no centralized HVAC control system in this facility.
- The AHUs and unit heaters are controlled via local thermostats.



Facility Information – Mountain View (Dry Phase)

Facility Name:

Mountain View WPCF (Dry Phase)

Address:

205 Dey Rd
Wayne, NJ 07470

Gross Floor Area:

47,250 sq. ft.

Year Built:

1978

Occupants:

30 (Est*)

Building Usage:

The building houses thickener belts and several other process equipment, offices, storage, laboratory and maintenance shop. Regular operating hours are between 7:30 am and 3:30 pm, Monday through Friday. The facility is closed on weekends, except during emergencies.

Average occupancy:

8 hours per day, 40 hours per week.

Construction Features:

Façade:

Concrete block with brick walls, in good condition.

Roof Type:

Flat with slightly pitched sections. Grey in color. The roof consists of EPDM and gravel.

Windows:

Covering 25% of façade, both fixed and operable aluminum frame single pane windows, in good condition.

Exterior Doors:

There are three (3) overhead garage doors and three (3) opaque doors in the facility. All exterior doors are in good condition.



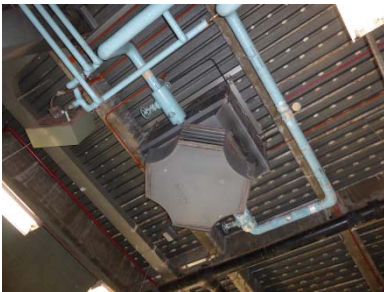


Facility Information – Mountain View (Dry Phase)

Major Mechanical Systems

Heating Ventilation and Air Conditioning - HVAC

- A 30-ton split multizone Trane AC unit serves various offices, the lobby, lunch room, electrical room and lab. (Trane, over 20 years old)
- A multizone H&V unit serves the reception area, operations room, and various spaces (Wing H&V unit, over 20 years old)
- A 6-ton split AC unit serves the MIP room (Trane, 30 Ton, 2008, good condition).
- Two (2) stairwells are heated with hot water convectors at each floor level.
- The Belt press area, Ash Conveyor Room, Belt Room and unused back room are heated via hot water heating and ventilation units.
- Perimeter offices are heated with hot water baseboard heaters.
- The Compressor Room is served by a hot water unit heater.
- The Floatation Room is served by an H&V unit.
- There is a H&V unit dedicated for the Bay areas in the Service Building.





Facility Information – Mountain View (Dry Phase)

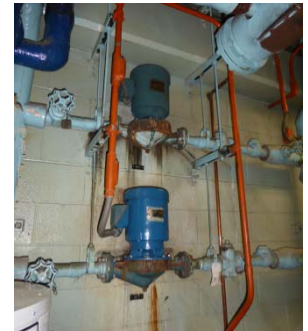
Major Mechanical Systems (cont'd)

Heating Systems

- The Service Building has a Raypak natural gas fueled boiler. The unit was manufactured in 2011, has a heating input capacity of 750 MBH, and has an efficiency of 87%.
- There are two (2) Cleaver Brooks hot water boilers but these boilers were disconnected when the Raypak boiler was installed.
- Several small hot water circulators deliver hot water to various zones and HVAC units for space heating.

Domestic Hot Water

- Domestic Hot Water (DHW) is provided by two (2) electric 80 gallon A.O. Smith water heaters for the Service Building.



Facility Information – Mountain View (Dry Phase)

Major Mechanical Systems

Process Systems

- This building serves as the processing plant for the thickened sludge.
- The building houses thickener belt press machines and auxiliaries such as the polymer machine, vacuum pumps, water pumps, and thickened sludge pumps.
- The building houses two (2) large incinerators and an exterior thermal oxidizer, all of which were shut down in 2013. Thickened sludge is transported to another facility for further processing.
- Since incinerator operation was shut down, all equipment in the incinerator areas is disconnected or disabled.
- The building also houses service water pumps for the entire facility (3 x 100 HP). One of these pumps is currently disconnected for servicing. These pumps are on VFDs.





Facility Information – Mountain View (Dry Phase)

Major Mechanical Systems

Process Systems Controls

- Currently the water treatment process systems are monitored and partially controlled by a SCADA (Supervisory Control Active Data Acquisition) system.
- It was reported and observed that many of the process controls are set manually at the equipment level.
- Aeration tank levels are manually maintained, which will have tremendous impact on the energy consumption and the performance of the aeration systems.
- Many of the pumps are coupled with variable frequency drives. However, many of these are set manually to a predetermined frequency instead of modulating based on a performance factor.

HVAC Controls

- There is no Building Automation System in this facility.
- The AHU units are controlled via local thermostats.
- There are two (2) large exhaust fans, three (3) large intake fans and eight (8) small exhaust fans for the Service Building.





Facility Information – West Belt Water Pump Station

Facility Name:

West Belt Water Pump Station

Address:

70 West Belt

Wayne, NJ 07470

Gross Floor Area:

3,000 sq. ft.

Year Built:

1991

Building Usage:

The building is used as a water pump station and runs 24 hours a day, 7 days a week.



Construction Features:

Façade:

Concrete block and brick walls, in good condition.

Roof Type:

Pitched roof.

Windows:

Covering 10% of façade, both fixed and operable aluminum frame, double pane windows, in good condition.

Exterior Doors:

Two (2) opaque entry doors and one loading dock overhead door.



Facility Information – West Belt Water Pump Station

Major Mechanical Systems

- Three (3) 250 HP and two (2) 150 HP city water pumps.
- Two (2) pumps (75 HP each) that are controlled by VFDs.
- Estimated run hours for the pumps are as follows:

<u>Pump</u>	<u>Power (HP)</u>	<u>Hours</u>
P1	75	3000
P2	75	2500
P3	150	2500
P4	150	2000
P5	250	3000
P6	250	2500
P7	250	2000

- Pumping station control is achieved via a remote controlled PLC system, which maintains service pressure by dispatching pumps automatically.
 - *System adds or removes additional pumps as the system pressure fluctuates during the day.*
- It is recommended to install additional VFDs on all pumps in this pumping station.
- The building has electric unit heaters and baseboard heaters for space heating.
- There is one (1) window AC unit in the control room.
- Heaters are controlled by mechanical thermostats. Minimum heating needed in the building due to large electric pumps.
- Exhaust fans are utilized for space cooling and ventilation during summer. The fans are controlled by thermostats.





Facility Information – Wanaque Water Pump Station

Facility Name:

Wanaque Water Pump Station

Address:

529 Newark Pompton Tpke

Wayne, NJ 07470

Gross Floor Area:

800 sq. ft.

Year Built:

1978

Building Usage:

The building is used as a water pump station and runs 24 hours a day, 7 days a week.

Construction Features:

Façade:

Concrete block and brick walls, in good condition.

Roof Type:

Flat roof.

Windows:

Small windows with relief fans.

Exterior Doors:

One service entry door.

Major Mechanical Systems

- Two (2) city water pumps (150 HP each) on VFDs.
- One of the motors is approx. thirty years old and needs to be replaced.
- Heating is provided by electric unit heaters.
- One electric hot water heater is connected to the utility sink.





Facility Information – Jacobus Water Pump Station

Facility Name:

Jacobus Water Pump Station

Address:

40 Jacobus Avenue

Wayne, NJ 07470

Gross Floor Area:

2,200 sq. ft.

Year Built:

1969

Building Usage:

The building is used as a water pump station and runs 24 hours a day, 7 days a week.



Construction Features:

Façade:

Concrete block and brick walls, in good condition.

Roof Type:

Pitched roof.

Windows/Exterior Doors:

Covering 10% of façade, both fixed and operable aluminum frame, double pane windows, in good condition. There is one opaque door.

Major Mechanical Systems

- Three (3) pumps (200 HP each) controlled by PLC Pump Controllers.
- Two of the pumps are driven with variable speed electric pumps.
- The third pump is a spare pump, which can be driven with a diesel engine.
- VFDs are old and obsolete.
- Heaters are controlled by standard mechanical thermostats.





Facility Information – Lower Preakness Sewer Pump Station

Facility Name:

Lower Preakness Sewer Pump Station

Address:

180 Dey Road
Wayne, NJ 07470

Gross Floor Area:

2,200 sq. ft.

Year Built:

1980

Building Usage:

The building is used as a sewer pump station and runs 24 hours a day, 7 days a week.

Construction Features:

Façade:

Concrete block and brick walls, in good condition.

Roof Type:

Flat roof.

Windows:

None

Exterior Doors:

There is one opaque service door.



Major Mechanical Systems

- Three (3) pumps (250 HP each) controlled via VFDs.
- VFDs date back to 1997 and are obsolete.
- Heating is provided by overhead electric unit heaters, controlled by thermostats.
- There is an exhaust fan for the lower level.



Facility Information – Sheffield Sewer Pump Station

Facility Name:

Sheffield Sewer Pump Station

Address:

14 Farmingdale Road

Wayne, NJ 07470

Gross Floor Area:

2,000 sq. ft.

Year Built:

1978

Building Usage:

The building is used as a sewer pump station and runs 24 hours a day, 7 days a week.



Construction Features:

Façade:

Residential type concrete block and brick building, in good condition.

Roof Type:

Pitched roof.

Windows:

Covering 10% of façade, operable wooden frame, double pane windows, in fair condition.

Exterior Doors:

Two opaque doors and a garage door for service entry.



Facility Information – Sheffield Sewer Pump Station

Major Mechanical Systems

- Two (2) new pumps (200 HP each) that are controlled by VFDs, and one (1) 75 HP pump with VFD controls.
- VFDs are fairly new and in good condition.
- Heating is provided by electric unit heaters.
- Heaters are controlled by thermostats.
- The 75 HP pump appears to be old and in need of replacement.
- A Gas fired domestic water heater is connected to the utility sinks.





Facility Information – Alps Road Water Pump Station

Facility Name:

Alps Road Water Pump Station

Address:

1163 Alps Road
Wayne, NJ 07470

Gross Floor Area:

2,200 sq. ft.

Year Built:

1969

Building Usage:

The building is used as a water pump station and runs 24 hours a day, 7 days a week.

Construction Features:

Façade:

Concrete block and brick walls, in good condition.

Roof Type:

Pitched roof.

Windows:

Covering 10% of façade, both fixed and operable wooden frame double pane windows, in good condition.

Exterior Doors:

There is one opaque door.

Major Mechanical Systems

Controls

- There are two (2) pumps (100 HP each) on VFD controls.
- This facility can be remotely activated.
- Heating is provided by electric unit heaters.
- There are exhaust fans for cooling in the summer.



Greenhouse Gas Emission Reduction

Implementation of all identified ECMs will yield:

- 1,000,885 kilowatt-hours of annual avoided electric usage.
- 7,783 Therms of annual increased natural gas usage.
- 15,000 Gallons of annual avoided #2 oil usage.
- This equates to the following **annual** reductions:

- 632 tons of CO₂;

-OR-

- 109 Cars removed from road;

-OR-

- 172 Acres of trees planted annually



The Energy Information Administration (EIA) estimates that power plants in the state of New Jersey emits 0.666 lbs CO₂ per kWh generated.



The Environmental Protection Agency (EPA) estimates that one car emits 11,560 lbs CO₂ per year.



The EPA estimates that reducing CO₂ emissions by 7,333 pounds is equivalent to planting an acre of trees.



Energy Conservation Measures (ECMs) Notes and Assumptions

- The average CO₂ emission rate from power plants serving the facilities within this report was obtained from the Environmental Protection Agency's (EPA) eGRID2007 report. It is stated that power plants within the state of NJ emit 0.66 lbs of CO₂ per kWh generated.
 - *The EPA estimates that burning one therm of natural gas emits 11.708 lbs CO₂.*
 - *The EPA estimates that one car emits 11,560 lbs CO₂ per year.*
 - *The EPA estimates that reducing CO₂ emissions by 7,333 pounds is equivalent to planting an acre of trees.*
- The following utility prices provided were used within this study:

Facility Name	Electricity (\$/kWh)	Natural Gas (\$/therm)	#2 Oil \$/Gallon
DPW Garage	\$0.1490	\$0.9726	
Sewer Plant (Wet&Dry Phase)	\$0.1255	\$1.7692	\$2.9495
Municipal Township Bldg	\$0.1401	\$0.9134	
Wayne Public Library	\$0.1444	\$0.9372	
Alps Road Water Pump Station	\$0.1416	-	-
Jacobus Water Pump Station	\$0.1308	-	-
Lower Preakness Sewer Pump Station	\$0.1600	-	-
Sheffield Sewer Pump Station	\$0.1302	-	-
Wanaque Water Pump Station	\$0.1179	-	-
West Belt Water PumpStation	\$0.1300	-	-



ECM #1: Computer Power Management

ECM #1: Computer Power Management	Municipal Building / Police Dept	Public Library	DPW Garage	TOTAL
Estimated Annual Savings:	\$3,600	\$2,695	\$357	\$6,652
Gross Estimated Implementation Cost ¹ :	\$5,340	\$3,480	\$600	\$9,420
Approx. NJ Smart Start Rebate ² :	\$0	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$5,340	\$3,480	\$600	\$9,420
Simple Payback (years):	1.5	1.3	1.7	1.4
Annual Avoided CO ₂ Emissions (tons):	8.6	6.2	0.8	15.6

¹ Cost estimates based on a previous vendor quote

² No prescriptive New Jersey Smart Start rebates are available for this measure

- A number of desktop computers were observed to be running in screen saver mode during the survey.
- Computer screen savers were originally developed to prevent the permanent etching of patterns on older monochrome monitors. In this mode, both the computer and monitor consume the same amount of energy as the computer in regular operation, which is approximately 225W for the computer and 75W for the monitor.
- Dome-Tech recommends installing a computer power management system. This software would place the computers into a standby/sleep mode during periods of inactivity. In this mode, the computer and monitor will draw between 1 and 3 Watts each. This would significantly reduce the computers electrical energy consumption.
 - The computers will “wake up” instantaneously when the mouse or button on the keyboard is touched, causing no interruption during daytime use.
 - When the computers “wake up,” all active files and programs will be available as before entering the standby/sleep mode, ensuring no data will be lost.
- This ECM is not expected to reduce the building(s)’ electrical demand.



ECM #2: Lighting Equipment Upgrade

ECM #2: Lighting Equipment Upgrade	DPW Garage	Mountain View WPCF (Wet&Dry)	Municipal Building / Police Dept	Public Library	Pump Station - Alps Rd.
Estimated Annual Savings:	\$8,528	\$11,287	\$9,169	\$10,693	\$38
Gross Estimated Implementation Cost ¹ :	\$49,764	\$74,304	\$93,740	\$93,104	\$2,004
Approx. NJ Smart Start Rebate ² :	\$12,880	\$16,780	\$23,630	\$21,180	\$440
Net Estimated Implementation Cost:	\$36,884	\$57,524	\$70,110	\$71,924	\$1,564
Simple Payback (years):	4.3	5.1	7.6	6.7	40.7
Annual Avoided CO ₂ Emissions (tons):	19.1	30.0	21.8	24.7	0.1

Pump Station - Jacobus	Pump Station - Lower Preakness	Pump Station - Sheffield Sewer	Pump Station - Wanaque	Pump Station - West Belt	TOTAL
\$4	\$105	\$58	\$8	\$111	\$40,003
\$150	\$2,454	\$1,500	\$384	\$3,756	\$321,160
\$40	\$540	\$140	\$80	\$950	\$76,660
\$110	\$1,914	\$1,360	\$304	\$2,806	\$244,500
26.3	18.2	23.5	36.3	25.2	6.1
0.0	0.2	0.1	0.0	0.3	96.3

¹ Cost estimates based on actual costs of similar comprehensive lighting projects; see room-by-room surveys in Appendix for details

- Dome-Tech performed a room-by-room lighting audit of each facility. Audit findings and recommendations are summarized below:

- **Existing Conditions:**

- **Interior Lighting, Wayne Township Building**

- The majority of lighting is provided with 2'x2' and 2'x4' recessed fixtures with 2-3 F32T8 lamps. There were a small number of floods, induction lamps and CFLs.
 - Hallways are lit with 2'x4' F32T8 lamps. Stairwell lighting is provided by 2'x4' recessed fixtures with F32T8 lamps.
 - Restrooms have a mixture of 2'x2' T8 lamps and U8-lamps.



ECM #2: Lighting Equipment Upgrade

➤ Existing Conditions (cont'd):

➤ Interior Lighting, Library

- The majority of lighting is provided with 2'x2' and 2'x4' recessed fixtures with 2-3 F32T8 lamps. The circulation lobby lighting is provided by 26 W CFLs.
- Hallways are lit with 2'x4' F32T8 lamps. Stairwell lighting is provided by 2'x4' recessed fixtures with F32T8 lamps.
- Restrooms have a mixture of 2'x2' T8 lamps and U-lamps.

➤ Interior Lighting, DPW Garage

- The majority of lighting, including the hallways and the restrooms, is provided by 2'x4' recessed troffers with 2-3 F34T12 lamps.
- Most of the big, open storage areas are lit by 8' pendant fixtures with F96T12 lamps.
- The Water Dept. Garage has 400W metal halides.

➤ Interior Lighting, Sewer Plant (Mountain View, Wet & Dry Phase)

- The majority of lighting is provided by 2 and 3 lamp fixtures with T8 lamps
- Some spaces are lit with fluorescent T12 lamps

➤ Interior Lighting, Sewer/Water Pump Stations

- The majority of lighting is provided by 2 and 3 lamp fixtures with T8 lamps
- Some spaces are lit with fluorescent T12 lamps
- Incandescent lamps are used in low access areas.

➤ Recommendations:

- Our analysis is based on replacing all T8/T12 fluorescent tubes and incandescent lights with LED tubes or LED screw-in lamps.
- LED tube lighting installation is fairly straightforward. First, the existing ballast is bypassed. Then, the fluorescent tubes are simply replaced with LED tubes. This can often be implemented with in-house personnel.

ECM #2: Lighting Equipment Upgrade

- Dome-Tech performed a lighting audit of the exterior of each facility. Audit findings and recommendations are summarized below:
- **Existing Conditions:**
 - **Exterior Lighting, Wayne Township Building**
 - Exterior lighting is provided by 60W and 100W induction and 150W metal halides in various fixture types as well as 100W wall mounted incandescent flood lamps.
 - **Exterior Lighting, Library**
 - One 1000W metal halide and several 150W metal halides surrounding the perimeter of the building.
 - **Exterior Lighting, DPW Garage**
 - The open areas are lit by several 250W and 400W wall mounted high pressure sodium lamps.
 - **Exterior Lighting, Sewer Plant (Mountain View, Wet & Dry Phase)**
 - The majority of outside lighting is provided by 60W incandescent lamps with wallpack fixtures for the office building and on light poles for the tank and thickener areas.
 - **Exterior Lighting, Sewer-Water Pump Stations**
 - The building exteriors have 150W high pressure sodium and 60W incandescent lamps.
- **Recommendations:**
 - Our analysis is based on replacing all existing metal halide fixtures with LED tubes.
 - See Investment Grade Lighting Audit Appendix for details.
 -



ECM #3: Lighting Controls Upgrade

ECM #3: Lighting Controls Upgrade	DPW Garage	Mountain View WPCF (Wet&Dry)	Municipal Building / Police Dept	Public Library	TOTAL
Estimated Annual Savings:	\$1,844	\$1,191	\$1,548	\$2,994	\$7,576
Gross Estimated Implementation Cost ¹ :	\$9,860	\$15,000	\$22,870	\$12,000	\$59,730
Approx. NJ Smart Start Rebate ² :	\$1,390	\$2,100	\$4,655	\$1,680	\$9,825
Net Estimated Implementation Cost:	\$8,470	\$12,900	\$18,215	\$10,320	\$49,905
Simple Payback (years):	4.6	10.8	11.8	3.4	6.6
Annual Avoided CO ₂ Emissions (tons):	4.1	3.2	3.7	6.9	17.9

¹ Cost estimates based on actual costs of similar comprehensive lighting projects. See room-by-room surveys in Appendix for details.

² See appendix for details on NJ Smartstart rebates

- Dome-Tech performed a room-by-room lighting audit at each facility. Audit findings and recommendations are summarized below:
 - The majority of the spaces have no means of automatic lighting control.
 - Energy savings can be achieved by installing occupancy sensors in classrooms, offices and restrooms.
 - An occupancy sensor can switch off the lights when the room is not occupied.
 - Dome-Tech recommends installing ceiling mount and/or wall mount occupancy sensors where applicable.
 - See Investment Grade Lighting Audit Appendix for detailed calculations.





ECM #4: AC Unit Upgrades

ECM #4: AC Unit Upgrades	Municipal Building / Police Dept	Mountain View WPCF (Wet&Dry)	TOTAL
Estimated Annual Savings:	\$8,889	\$3,313	\$12,203
Gross Estimated Implementation Cost ¹ :	\$151,984	\$37,700	\$189,684
Approx. NJ Smart Start Rebate ² :	\$6,804	\$1,200	\$8,004
Net Estimated Implementation Cost:	\$145,180	\$36,500	\$181,680
Simple Payback (years):	16.3	11.0	14.9
Annual Avoided CO ₂ Emissions (tons):	24.5	8.8	33.3

- Some of the air conditioning systems at the Wayne Township Buildings are near or beyond the end of their useful service life. These units are in fair or poor condition and need replacement.
- Current HVAC systems can provide significantly higher part load and full load efficiency due to inverter driven variable speed compressors and more efficient refrigerants.
- HVAC unit replacement is typically a costly undertaking and it cannot always be justified solely by energy savings.
- This analysis quantifies the energy savings that may be achieved by replacing the older air conditioning units.
- Dome-Tech recommends replacing only the equipment that has a positive net present value in replacement. For the other units, it is recommended to replace them when each unit start to have frequent service calls.
- See ECM Calculations Appendix for the list of equipment included in this analysis.

ECM #5: Boiler Upgrade

ECM #5: Boiler Replacement	Municipal Building / Police Dept	Public Library	TOTAL
Estimated Annual Savings:	\$5,007	\$891	\$5,898
Gross Estimated Implementation Cost ¹ :	\$150,000	\$40,000	\$190,000
Approx. NJ Smart Start Rebate ² :	\$3,000	\$1,313	\$4,313
Net Estimated Implementation Cost:	\$147,000	\$38,688	\$185,688
Simple Payback (years):	29.4	43.4	31.5
Annual Avoided CO ₂ Emissions (tons):	32.1	5.6	37.6



- The Municipal Building and the Public Library house a gas fired Pacific fire-tube boiler and a gas fired sectional Crown Hot Water Boiler, respectively.
- The Municipal Building boiler is 55 years old. Due to age, the boiler requires frequent repairs and causes other maintenance issues. The Public Library boiler is 15 years old, in fair condition.
- Dome-Tech reviewed energy cost and savings potential for replacing the boilers with modular condensing hot water boilers. The proposed system includes modular condensing hot water boilers, which will minimize cycling losses and reduce energy costs.
- Boiler replacement is typically a costly undertaking and it cannot always be justified solely by energy savings.
- This ECM is not recommended for implementation as a standalone energy savings measure at this time due to very low return on investment. However, it should be considered if a holistic energy improvement program is considered in the future (Such as NJ ESIP).
- See Appendix for detailed calculations.



ECM #6: Building Automation System

ECM #6: Building Automation System	DPW Garage	Mountain View WPCF (Wet&Dry)	Municipal Building / Police Dept	Public Library	TOTAL
Estimated Annual Savings:	\$5,057	\$12,995	\$16,539	\$5,735	\$40,327
Gross Estimated Implementation Cost ¹ :	\$76,500	\$209,950	\$146,000	\$93,885	\$526,335
Approx. NJ Smart Start Rebate ² :	\$5,354	\$8,585	\$18,740	\$6,299	\$38,978
Net Estimated Implementation Cost:	\$71,146	\$201,365	\$127,260	\$87,586	\$487,357
Simple Payback (years):	14.1	15.5	7.7	15.3	12.1
Annual Avoided CO ₂ Emissions (tons):	17.8	41.7	51.8	18.6	129.8

- Current HVAC systems at the Wayne Township Buildings are controlled with a variety of digital and analog thermostats as well as pneumatic thermostats.
- Review of the thermostats indicated that there is no central control over the setpoints and schedules for the HVAC units.
- Installation of a Building Automation System is recommended in order to schedule/control HVAC systems in each facility.
- This ECM includes installing a Building Automation System with an ethernet-based Direct Digital Controls (DDC) system and a front end controller for each facility.
- The proposed system will control all the Rooftop HVAC units, VAV boxes, reheat coils, H&V units, boilers and pumps.
- The proposed system also includes a customized schedule for each HVAC system based on the occupancy characteristics of the corresponding spaces.
- A Building Automation System has the potential to produce substantial energy savings by monitoring and controlling the large energy using equipment in a facility. According to a U.S. DOE sponsored study ("Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways, 2005", commercial buildings save 5-15% energy savings by implementing Energy Management and Control Systems.
- Dome-Tech estimated a 5-10% savings potential for each facility based on observed operating practices.
- See Building Automation System Energy Savings Appendix for detailed calculations.



ECM #7: Premium Efficiency Motors

ECM #7: Premium Efficiency Motors	Mountain View WPCF (Wet&Dry)	TOTAL
Estimated Annual Savings:	\$3,766	\$3,766
Gross Estimated Implementation Cost ¹ :	\$42,979	\$42,979
Approx. NJ Smart Start Rebate ² :	\$1,685	\$1,685
Net Estimated Implementation Cost:	\$41,294	\$41,294
Simple Payback (years):	11.0	11.0
Annual Avoided CO ₂ Emissions (tons):	10.0	10.0

- Dome-Tech performed a review of the existing electric motors in each facility.
- Most of the existing motors serving the AHU's and pumps are newer standard efficiency or high efficiency motors. Replacing these motors with premium efficiency motors results with minimal amount of energy savings.
- In addition, many of the large motors in the Pump Stations and the Sewer Plant are on Variable Frequency Drives, which makes the overall system more efficient. Therefore, upgrading the motors that are on drives will not allow the investment to pay itself back in a reasonable time.
- Under these constraints, Dome-Tech identified approximately 18 motors that may be candidate for replacing, which can be found in the Premium Efficiency Motor Appendix. The analysis resulted with a positive IRR.
- Since this ECM has a positive IRR, it is recommended for implementation.
- Dome-Tech recommends replacing any motor with a premium efficiency motor when it starts to fail. The new motors will reduce the electrical consumption of the buildings' motors by approximately 3-10%.

ECM #8: Vending Machine Power Management

ECM #8: Vending Machine Controls	DPW Garage	Municipal Building / Police Dept	Public Library	TOTAL
Estimated Annual Savings:	\$288	\$542	\$326	\$1,156
Gross Estimated Implementation Cost ¹ :	\$550	\$1,100	\$825	\$2,475
Approx. NJ Smart Start Rebate ² :	\$0	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$550	\$1,100	\$825	\$2,475
Simple Payback (years):	1.9	2.0	2.5	2.1
Annual Avoided CO ₂ Emissions (tons):	0.6	1.3	0.8	2.7

¹ Cost estimates based on previous vendor quote

² No prescriptive New Jersey Smart Start rebates are available for this measure

- Dome-Tech recommends installing a vending machine power management device on all snack and soda vending machines.
- These devices reduce electrical energy consumption by turning off the unit's lights and managing compressor cooling cycles when the surrounding area is vacant. It automatically re-powers the cooling system at one to three hour intervals, independent of sales, to ensure that the product stays cold.
- The microcontroller will never power down the machine while the compressor is running, eliminating compressor short-cycling. In addition, when the machine is powered up, the cooling cycle is allowed to finish before again powering down (which reduces compressor wear and tear).
- This measure can be implemented by the operations staff.
- This ECM is not expected to reduce the electrical demand of the building(s).





ECM #9: Aeration System Controls Upgrade

ECM #9: Aeration System Controls Upgrade	Mountain View WPCF (Wet&Dry)	TOTAL
Estimated Annual Savings:	\$15,344	\$15,344
Gross Estimated Implementation Cost ¹ :	\$98,000	\$98,000
Approx. NJ Smart Start Rebate ² :	\$19,567	\$19,567
Net Estimated Implementation Cost:	\$78,433	\$78,433
Simple Payback (years):	5.1	5.1
Annual Avoided CO ₂ Emissions (tons):	40.7	40.7

- The Wayne Township Water Treatment Plant uses surface aerators.
- Surface aerators are very sensitive to submersion rate and energy consumption and system performance varies significantly based on the waste water level in the aeration tanks.
- Currently, the aeration tank waste water levels are set and maintained manually while monitoring the system. Aeration performance is measured daily and the system is fine-tuned accordingly. This is typically a labor intensive effort and prone to errors.
- We recommend installation of DO (dissolved oxygen) sensors which control the basin levels automatically using the SCADA system network.
- **Automatic DO Control**
 - Automated DO control systems use real-time dissolved oxygen (DO) concentration readings from DO probes located within the aeration basins.
 - The process controller provides control output to the aeration system that responds by adjusting the amount of submersion of the aerator turbines.
 - Energy savings calculations are based on previous detailed studies and experiments presented in the EPA's "Evaluation of Energy Conservation Measures" handbook published in 2010.

ECM #10: WPCF: Service Water Pump Upgrade

ECM #10: Service Water Pump Replacement	Mountain View WPCF (Wet&Dry)	TOTAL
Estimated Annual Savings:	\$3,688	\$3,688
Gross Estimated Implementation Cost ¹ :	\$74,700	\$74,700
Approx. NJ Smart Start Rebate ² :	\$4,704	\$4,704
Net Estimated Implementation Cost:	\$69,996	\$69,996
Simple Payback (years):	19.0	19.0
Annual Avoided CO ₂ Emissions (tons):	9.8	9.8



- There are three 100 HP service water pumps for the Wayne WPCF.
- The pumps are on VFD and they usually run at 50% or less speed. Even though speed reduction via VFD saves energy, operating a pump outside of its design conditions usually result with less than ideal pump hydraulic efficiency.
- It is recommended to install a 50 HP service water pump with a VFD for low load operation conditions.

ECM #11: WPCF: Boiler Fuel Switching

ECM #11: Boiler Fuel Switching	Mountain View WPCF (Wet&Dry)	TOTAL
Estimated Annual Savings:	\$20,946	\$20,946
Gross Estimated Implementation Cost ¹ :	\$165,000	\$165,000
Approx. NJ Smart Start Rebate ² :	\$2,000	\$2,000
Net Estimated Implementation Cost:	\$163,000	\$163,000
Simple Payback (years):	7.8	7.8
Annual Avoided CO ₂ Emissions (tons):	78.9	78.9

- Wayne WPCF has electric heating in the maintenance shop and oil heating in the wet phase structures.
- Electric heating is inherently an inefficient and expensive process.
- Similarly, oil heating is typically more than 2 times more expensive than gas heating.
- It is recommended to retrofit existing oil boilers in the Chlorine Building with gas burners and install hot water heating loop to the maintenance shop.

ECM #12: Variable Frequency Drives

ECM #12: Variable Frequency Drives	Mountain View WPCF (Wet&Dry)	Pump Station - West Belt	TOTAL
Estimated Annual Savings:	\$22,798	\$40,095	\$62,893
Gross Estimated Implementation Cost ¹ :	\$171,193	\$300,423	\$471,616
Approx. NJ Smart Start Rebate ² :	\$2,697	\$3,510	\$6,207
Net Estimated Implementation Cost:	\$168,496	\$296,913	\$465,409
Simple Payback (years):	7.4	7.4	7.4
Annual Avoided CO ₂ Emissions (tons):	60.5	102.7	163.2

- There is a significant number of pumps and fans serving various spaces, equipment and processes in the Wayne Township Buildings and the Waste Water Treatment Plan.
- Some of these systems can be converted to Variable Flow system using Variable Frequency Drives.
- Variable frequency drives save energy by reducing flow or total pressure in a system when full flow or full pressure is not always necessary.
- Following is a summary of Variable Speed Drive installation opportunities in each site.
- Waste Water Treatment Plant (Wet and Dry Phase):
 - Majority of motors already have VFDs. However, a significant portion of the remaining motor can be fitted with VFDs. See equipment list and Variable Frequency Drive Appendix for further details.
- West Belt Pump Station
 - Two of the pumps are on VFDs. It is recommended to install VFDs for all the remaining large pumps.
 - See Variable Frequency Drive Appendix for further details.

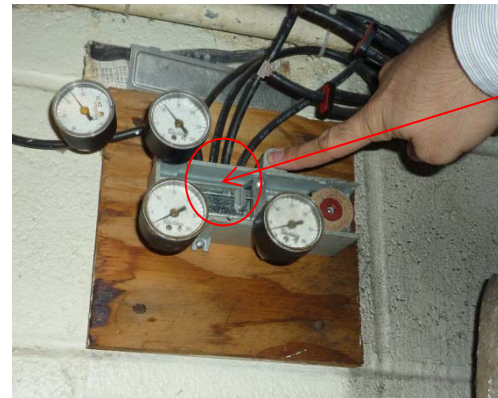
ECM #12: Variable Frequency Drives

- Municipal Building:
 - VFDs are not applicable in this building since all the RTUs are constant volume units with DX cooling coils and gas fired heating coils. Reducing flow will reduce ventilation air. It may also cause coil freezing or coil overheating damage.
- Public Library:
 - VFDs are not applicable in this building since all the RTUs are constant volume units with DX cooling coils and gas fired heating coils. Reducing flow will reduce ventilation air. It may also cause coil freezing or coil overheating damage.
- DPW Garage:
 - VFDs are not applicable in this building since the Truck Bay MUA is a constant volume unit with gas fired heating coils. Reducing flow will violate minimum ventilation requirements. It may also cause overheating damage to the gas fired coils.
- Other pump stations
 - The pumps in the remaining pump stations are already controlled via VFDs.
- This ECM also includes electric motor replacement regardless of the type of existing motors.
- It is recommended to further investigate the existing infrastructure before implementing this ECM.
- See Variable Frequency Drive Calculation Appendix for detailed list of motors, summary of scope of work and energy savings calculations.

Operational and Maintenance Issues

Wayne Township Building

- In the Health Department basement, the OEM Room was significantly overheated (~80F). The thermostat is located at the back of the room. It should be re-adjusted to a proper temperature (68F).
- The windows on the back office of the Engineering Department has deteriorated weather-stripping.
- The vestibule door next to the Engineering Department needs weather stripping.
- There is compressed air leaking in the Boiler Room next to the Council Chamber.



Wayne Township - Library

- Some of the computers in the Library were left "ON" with the monitor switched "OFF". It is recommended to put computers on sleep or hibernate mode when not in use during normal operating hours.

Operational and Maintenance Issues (cont'd)

Wayne Township – DPW Garage

- It is cumbersome for drivers to open and close the garage doors every time they bring an equipment in or out. Therefore, many times the garage doors are left open for extended periods of time. This lets unconditioned air move into the facility. In addition, weather-stripping on many of the garage doors have deteriorated, letting unconditioned air into the spaces. This causes infiltration issues and result with increased utility bills.
 - Dome-Tech recommends installing a system with a sensor for automatic control of the garage doors.
 - Dome-Tech recommends reconditioning the doors.
- The thermostat for the main office spaces is in one room, which is not necessarily representative of the other spaces in the building.
 - Dome-Tech recommends moving the thermostat from the office to the hallway. This should produce more equal heating of these spaces. In addition, HVAC ductwork may require rebalancing as well.
- The lighting fixtures in the Main Garage are hanging too high from the ground, not providing enough lighting.
 - Dome-Tech recommends lowering the fixtures to improve work space lighting or installing task lighting to increase productivity.



Operational and Maintenance Issues (cont'd)

Wayne Township – Mountain View WPCF (Dry & Wet Phase)

- The service water pumps in the Service Building are oversized for the current use.
 - Dome-Tech recommends installation of a new pump that is sized for the low load operation.
- The aeration pump level should not exceed 7 inches
 - Dome-Tech recommends the installation of an automatic control system
- The Scada system does not control the level of the EQ Basin
 - Dome-Tech recommends installation of a new system that will monitor the process and control EQ Basin level.
- There is no activity in the Incinerator area
 - Dome-Tech recommends installation of occupancy sensors so that lights will not remain on when the area is unoccupied.
- The newly installed induction light fixture have reliability issues and high rate of premature failures.
 - Dome-Tech recommends evaluating the current vendor's product line and making sure the products meet current standards.



Renewable/Distributed Energy Measures

Distributed Generation & Renewable Energy

- Distributed Generation (on-site generation) generates electricity from many small energy sources. These sources can be renewable (solar/wind/ geothermal) or can be small scale power generation technologies (CHP, fuel cells, microturbines).
- Renewable energy is energy generated from natural resources (sunlight, wind, and underground geothermal heat) which are naturally replenished.
- Dome-Tech performed a Solar Photovoltaic Energy Analysis and Combined Heat and Power Analysis for some of the Wayne Township buildings.
- See the following section and the Renewable Energy Analysis Appendix for further details.



Renewable Energy Technologies: Solar Photovoltaic

Solar Photovoltaic

- Sunlight can be converted into electricity using photovoltaics (PV).
- A solar cell or photovoltaic cell is a device that converts sunlight directly into electricity.
- Photons in sunlight hit the solar panel and are absorbed by semiconducting materials, such as silicon. Electrons are knocked loose from their atoms, allowing them to flow through the material to produce electricity.
- Solar cells are often electrically connected and encapsulated as a module, in series, creating an additive voltage. The modules are connected in an array. The power output of an array is measured in watts or kilowatts, and typical energy needs are measured in kilowatt-hours.
- This system application can be considered for potential placement on additional buildings or areas such in parking lots, in overhead mounting and on the roofs.



Renewable Energy Technologies: Solar Photovoltaic (cont'd)

Renewable Solar Energy Analysis for Wayne Township

Building	Municipal Building	DPW Garage	Public Library	Total
Locations to Install Panels	Roof	Roof	Roof	
Assumptions				
System Capacity, kW-dc (maximum utilization of roof space)	137	111	54	301
Annual Electric Generation, kWhrs of AC electricity produce	170,167	137,754	66,851	374,773
Total Annual Facility Electric Use, kWhrs	959,800	225,000	605,159	1,789,959
% of Total Annual Usage	18%	61%	11%	21%
All-In Cost of Electricity Year 1	\$0.140	\$0.149	\$0.144	\$0.144
Annual Electric Cost Savings	\$23,843	\$20,522	\$9,652	\$54,017
Estimated SREC Value (Year 1)	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC
Estimated year 1 SREC Revenue	\$17,017	\$13,775	\$6,685	\$37,477
Estimated Total Annual Revenue	\$40,860	\$34,297	\$16,338	\$91,494
Environmental Impact				
Equivalent Annual CO2 Emission Reduction (tons per year)	56.2	45.5	22.1	123.7
Equivalent Cars Removed From Road Annually	10	8	4	21
Equivalent Acres of Trees Planted Annually	15	12	6	34
Financial Results				
System Installed Cost	\$409,500	\$331,500	\$160,875	\$901,875
Simple Payback (Years)	10	10	10	10
IRR (25 Years)	9%	9%	11%	10%
Net Present Value (25 yrs, 4% discount rate)	\$352,395	\$352,395	\$348,233	\$914,745
1.Estimated CO2 Emissions Rate: 0.66 lbs/kWh 2.EPA Estimate: 11,560 CO2 per car 3.EPA Estimate:7,333 lbs CO2 per acre of trees planted				

Solar Photo Voltaic System

Non-Financial Benefits of Solar PV

- The implementation of solar PV projects at Wayne Township Municipal Building and DPW Garage would place your facilities at the forefront of renewable energy utilization. This allows Wayne Township the opportunity to not only gain experience with this energy technology, but also to win recognition as an environmentally sensitive, socially conscience municipality. Additionally, these projects could be incorporated into science education and additional curriculums to raise awareness of current energy alternatives.





Combined Heat and Power Analysis

- Water Treatment Plant has electric heating in the maintenance shop and oil heating in the wet phase structures.
- It is recommended to install a cogeneration system to run approximately 6-months to produce electricity and heating hot water in order to reduce electric and #2 oil usage for heating purposes.
- This analysis is based on a 150 kW (2x75kW) engine generator set.
- A thorough load analysis is required before implementing this ECM.

CHP/COGENERATION FEASIBILITY ANALYSIS		
Simple Payback		
System Size	150 kW	
Total Installed Cost	\$3,000 /kW	\$450,000
State Grant	\$1,000 /kW	(\$150,000)
Federal Investment Tax Credit	\$0 /kW	\$0
Net Installed Cost		\$300,000
Year 1 Annual Savings		
Avoided Electric Energy:	648,000 kWh	\$81,000
Avoided Heating Fuel:	885 MMBTU	\$24,415
Avoided Cooling:	0 kWh	\$0
CHP Gas:	2,212 MMBTU	(\$17,693)
Service Contract:	2.7 ¢/kWh	(\$17,496)
Net Annual Savings (Year 1)		\$70,226
Simple Payback		4.3



Utility Tariff and Rate Review: Electricity

- **Accounts and Rate Class:** Wayne Township has nine facilities included in this study. Each facility is served either by PSE & G or Jersey Central Power & Light. Third party supplier for Mountain View (Wet & Dry Phase) was Noble Americas which was switched to Hess as of 05/16/2013. Each facility was billed under various rate classes.

- **Electric Consumption and Cost:** Based on the one-year period studied, the total annual electric expenditure for the Township is about \$1,661,123 and the total annual consumption is about 12,726,305 kilowatt-hours (kWh).

- **Average/Effective Rate per kWh:** For the one year period studied, the Township's average monthly cost per kilowatt-hour ranged from 11.79¢/kWh to 16.00¢/kWh, inclusive of utility delivery charges. The Township's overall, average cost per kilowatt-hour during this period was 13.05¢/kWh.
 - *Note that these average electric rates are "all-inclusive"; that is, they include all supply service (generation and commodity-related) charges, as well as all delivery service charges. The supply service charges typically represent the majority (60-80%) of the total monthly bill. It is the supply portion of your bill that is deregulated, which is discussed on subsequent slides in this section.*

Utility Tariff and Rate Review: Natural Gas

- **Accounts and Rate Class:** Wayne Township has nine facilities, but only four (DPW Garage, Mountain View, Municipal Building and the Public Library) use natural gas. Accounts are from PSE&G, with Hess Gas company as the third party supplier under various rate classes with Firm Transportation.

- **Natural Gas Consumption and Cost:** Based on the one-year period studied, the total annual natural gas expenditure for the Township is about \$108,312 and the total annual consumption is about 99,198 Therms. Natural Gas is used mostly in the winter period for heating purposes.

- **Average/Effective Rate per Therm:** For the one year period studied, the Township's overall average cost is \$1.09 per therm.
 - *Note that these average electric rates are "all-inclusive"; that is, they include all supply service (generation and commodity-related) charges, as well as all delivery service charges. The supply service charges typically represent the majority (60-80%) of the total monthly bill. It is the supply portion of your bill that is deregulated, which is discussed on subsequent slides in this section.*



Utility Deregulation in New Jersey: Background and Retail Energy Purchasing

➤ Electric Accounts:

- In August 2003, per the Electric Discount and Energy Competition Act [N.J.S.A. 48:3-49], the State of New Jersey deregulated its electric marketplace thus making it possible for customers to shop for a third-party (someone other than the utility) supplier of retail electricity.
- Per this process, every single electric account for every customer in New Jersey was placed into one of two categories: "BGS-FP" or "BGS-CIEP". BGS-FP stands for Basic Generation Service-Fixed Price; BGS-CIEP stands for Basic Generation Service-Commercial and Industrial Energy Pricing.
- At its first pass, this categorization of accounts was based on rate class. The largest electric accounts in the State (those served under a Primary or a Transmission-level rate class) were moved into BGS-CIEP pricing. All other accounts (the vast majority of accounts in the State of New Jersey, including residential) were placed in the BGS-FP category, receiving default electric supply service from the utility.
- The New Jersey Board of Public Utilities (NJBPU) has continued to move new large energy users from the BGS-FP category into the BGS-CIEP category by lowering the demand (kW) threshold for electric accounts receiving Secondary service. Originally, this threshold started at 1,500kW; now, it has come down to 750 kW. So, if an account's "peak load contribution" (as assigned by the utility) is less than 750 kW, then that facility/account is in the BGS-FP category. If you are unsure, you may contact Dome-Tech for assistance.



Utility Deregulation in New Jersey: Background and Retail Energy Purchasing (cont'd)

- There are at least 3 important differentiating factors to note about each rate category:
 1. The rate structure for BGS-FP accounts is different than the rate structure for BGS-CIEP accounts.
 2. The “do-nothing” option (i.e., what happens when you don’t shop for retail energy) varies.
 3. The decision about whether, and why, to shop for a retail provider varies.

- **BGS-FP: Secondary (small to medium) Electric Accounts:**

- BGS-FP rate schedules for all utilities are set, and re-set, each year. Per the results of our State’s BGS Auction process, held each February, new utility default rates go into effect every year on June 1st. The BGS-FP rates become each customer’s default rates, and they dictate a customer’s “Price to Compare” (benchmark) for shopping purposes. To learn more about the BGS Auction process, please go to www.bgs-auction.com.
- A customer’s decision about whether to buy energy from a retail energy supplier is, therefore, predominantly dependent upon whether a supplier can offer rates that are lower than the utility’s (default) Price to Compare.

- **BGS-CIEP: Primary (large) Electric Accounts:**

- The BGS-CIEP category is quite different. These accounts pay an hourly market rate for energy when they do not switch to a retail provider.
- For BGS-CIEP accounts, the process of setting forth a buying strategy can be complex, which is why many public entities seek professional assistance when shopping for energy.
- For more information concerning hourly electric market prices for our region, please refer to www.pjm.com.



Utility Deregulation in New Jersey: Background and Retail Energy Purchasing (cont'd)

➤ **Natural Gas Accounts:**

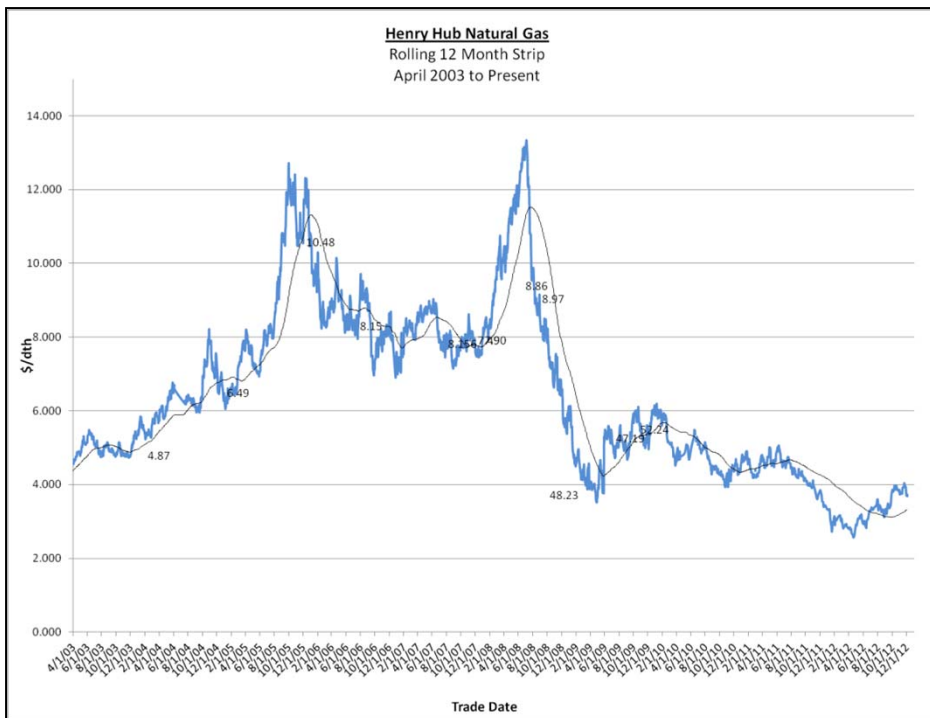
- The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate on a monthly basis. While natural gas is a commodity that is exceptionally volatile and that is traded minute-by-minute during open trading sessions, market rates are “settled” monthly, 3 business days prior to the subsequent month (this is called the “prompt month”). Customers that do not shop for a natural gas supplier will typically pay this monthly settlement rate to the utility, plus other costs that are necessary to bring gas from Louisiana (The “Henry Hub”) up to New Jersey (at the “City Gate”) and ultimately to your facility.
- For additional information about natural gas trading and current market futures rates for various commodities, you can refer to www.nymex.com.
- A customer’s decision about whether to buy natural gas from a retail supplier is typically dependent upon whether a customer seeks budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by enlisting a retail natural gas supplier. Many larger natural gas customers also seek the assistance of a professional consultant to assist in their procurement process.



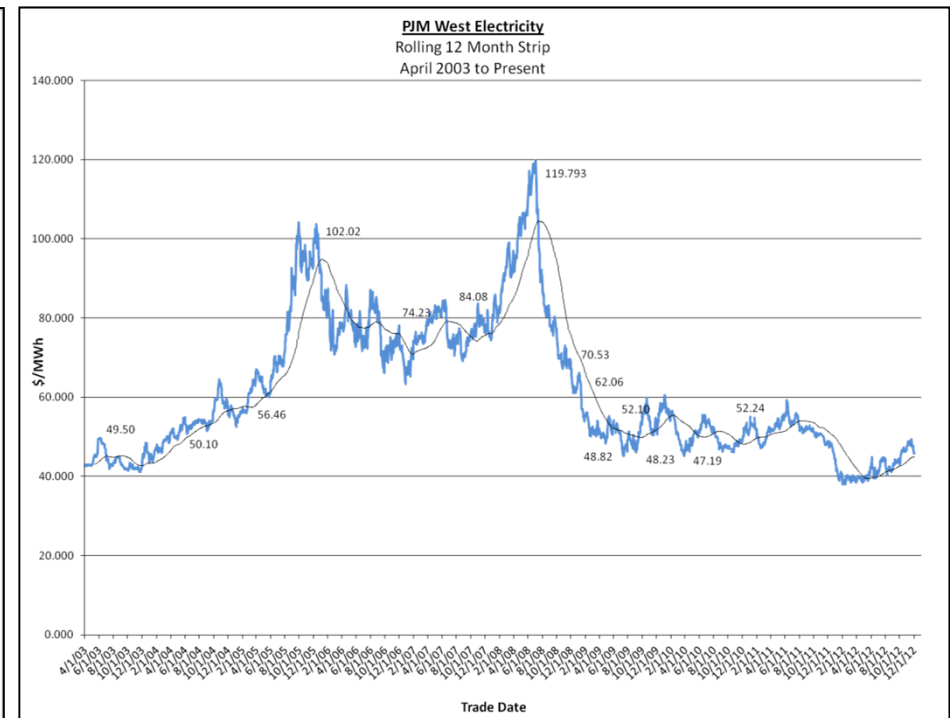
Historical Energy Futures Settlement Prices

Below please find graphs that show the last ten years' worth of market settlement prices for both natural gas and electricity. Each of these graphs shows the average closing prices of a rolling 12-month period of energy futures prices. The graphs are representative of the commodity, alone; they do not include any of the additional components (capacity, transmission, ancillary services, etc.) that comprise a retail energy price. They are meant to provide an indication of the level of pricing that a particular customer might expect to see, but the graphs do not account for the specific load profile of any individual energy user.

Natural Gas



Electricity





Potential Project Funding Sources

Through the NJ Clean Energy Program, the New Jersey Board of Public Utilities currently offers a variety of subsidies or rebates for many of the project types outlined in this report. More detailed information can be found at: www.njcleanenergy.com

- **NJ Smart Start Buildings** – Equipment Rebates noted in ECMs where available.
Equipment Rebates: Water Heaters, Lighting, Lighting Controls/Sensors, Chillers, Boilers, Heat Pumps, Air Conditioners, Energy Management, Systems/Building Controls, Motor-ASDs/VSDs, Custom/Others.
<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings>
- **Pay for Performance Program** – Performance-Based Incentives for installations. Provides incentives of up to \$0.11/ kWh and \$1.25/ therm saved; up to 25% of total project cost. A minimum reduction target of 15% compared to baseline must be achieved. Energy modeling of building and systems and energy reduction plan is required (incentives provided to pay for part of study costs).
<http://www.njcleanenergy.com/commercial-industrial/programs/pay-performance/existing-buildings>
- **Energy Savings Improvement Program (ESIP)** – Public entities can contract with energy saving companies (ESCO) in up to 20-year lease purchases enabling public entities to implement energy conservation measures at their facilities, and pay for the costs using the value of energy savings that result from the improvements. A “Do It Yourself” approach allows the public entity to contract with an engineering firm(s) to develop an Energy Savings Plan, develop plans and specs, oversee construction, commissioning, etc. (No ESCO is needed for the Do It Yourself approach).
<http://www.njcleanenergy.com/commercial-industrial/programs/energy-savings-improvement-program>



Potential Project Funding Sources (cont'd)

- **Direct Install Program** – NJ Clean Energy makes the investment in energy efficiency upgrades by initially covering 70% of the cost to install the recommended energy efficiency measures (up to \$75,000 per project). If eligible, the entity will pay ONLY 30% of the total cost to install the energy efficiency measures.

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

We encourage you to contact the program directly for further information

Steps to Participate for Buildings:

1. **CONTACT THE PARTICIPATING CONTRACTOR IN YOUR AREA**

Identify the contractor assigned and trained to provide Direct Install services in the county where your project is located. Using the contact information provided, call or email the Participating Contractor to discuss your project. The contractor will schedule an Energy Assessment and work with you to complete the Program Application and Participation Agreement. If you're unable to contact the Participating Contractor or have questions, you may contact us at 866-NJSMART or send an e-mail to DirectInstall@trcsolutions.com.

2. **REVIEW RESULTS**

After the Energy Assessment, the contractor will review results with you, including what measures qualify and your share of the project cost.

3. **DECIDE TO MOVE FORWARD**

You will sign a Scope of Work document to proceed with implementation of qualifying measures.

4. **ARRANGE INSTALLATION**

You and the Participating Contractor will set a convenient start date for the installation.

5. **CONFIRM INSTALLATION**

Once the Participating Contractor completes the installation, you accept the work by signing a Project Completion Form. A program representative will approve the project as complete.

6. **COMPLETE TRANSACTION**

You pay the Participating Contractor your share of the project cost and the program pays its share.

Next Steps

➤ **The following projects should be considered for implementation:**

- Address Operation and Maintenance Issues
- WPCF Boiler Fuel Switching
- Aeration System Controls Upgrade
- Building Automation System
- Upgrade Lighting Equipment and Controls
- Computer Power Management
- AC Unit Upgrades
- Upgrade Building Envelope
- Vending Machine Controls
- Premium Efficiency Motors

Note that additional “Phase 2” engineering may be required to further develop these projects, to bring them to bidding and implementation.

➤ **Consider applying for**

- Pay-For-Performance Program or Energy Savings Improvement Program
- SMARTSTART Custom Rebates for custom improvements at the WPCF

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www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

PORTFOLIO MANAGER / ENERGY STAR

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ENERGY STAR® Data Verification Checklist

65

ENERGY STAR®
Score¹

Wayne Township Municipal Building

Primary Function: Office
Gross Floor Area (ft²): 58,400
Built: 1960

For Year Ending: 02/28/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Wayne Township Municipal Building
475 Valley Road
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4060663

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Wayne Township Municipal Building

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: Office

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

475 Valley Road
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 58,400 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 90

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

Office: Building Use

1) Gross Floor Area: 58,400 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 60

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. It is possible that these hours may correspond to hours specified within a lease, during which the owner is required to provide the leasee with conditioned space. However, this number should never include additional HVAC startup or shutdown time. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Number of Computers: 329

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

4) Number of Workers on Main Shift: 225

Is this the total number of workers present during the primary shift? This is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.

☐ Yes ☐ No

5) Percent That Can Be Heated: 100

Is this the total percentage of the property that can be heated by mechanical equipment?

☐ Yes ☐ No

6) Percent That Can Be Cooled: 100

Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	3,262,281.7 (50%)
Natural Gas (kBtu)	3,286,963.7 (50%)
Total Energy (kBtu)	6,549,245.5

Energy Intensity

Site (kBtu/ft ²)	112.1
Source (kBtu/ft ²)	234.5

National Median Comparison

National Median Site EUI (kBtu/ft ²)	134.2
National Median Source EUI (kBtu/ft ²)	280.6
% Diff from National Median Source EUI	-16.43%

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e)	587.5
--	-------

Power Generation Plant or Distribution Utility:

Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Grid Meter #2	Electric	02/13/2013	In Use	Wayne Township Municipal Building
Natural Gas #2	Natural Gas	02/13/2013	In Use	Wayne Township Municipal Building

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Grid Meter #2 (kWh (thousand Watt-hours))

Associated With: Wayne Township Municipal Building

Start Date	End Date	Usage	Green Power?
02/13/2013	03/15/2013	74,400	No
03/15/2013	04/16/2013	79,200	No
04/16/2013	05/15/2013	71,800	No
05/15/2013	06/14/2013	81,000	No
06/14/2013	07/16/2013	105,400	No
07/16/2013	08/14/2013	90,000	No
08/14/2013	09/13/2013	85,200	No
09/13/2013	10/14/2013	70,200	No
10/14/2013	11/12/2013	72,800	No
11/12/2013	12/13/2013	77,400	No
12/13/2013	01/14/2014	76,600	No
01/14/2014	02/13/2014	75,800	No
02/14/2014	03/16/2014	74,400 estimate	No
Total Consumption (kWh (thousand Watt-hours)):			1,034,200
Total Consumption (kBtu (thousand Btu)):			3,528,690.4

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas #2 (therms)

Associated With: Wayne Township Municipal Building

Start Date	End Date	Usage
02/13/2013	03/15/2013	5,411.39
03/15/2013	04/16/2013	4,383.9
04/16/2013	05/15/2013	1,235.47
05/15/2013	06/14/2013	24.78

Start Date	End Date	Usage
06/14/2013	07/16/2013	7.58
07/16/2013	08/14/2013	7.6
08/14/2013	09/13/2013	8.7
09/13/2013	10/14/2013	35.76
10/14/2013	11/12/2013	3,252.32
11/12/2013	12/13/2013	5,352.14
12/13/2013	01/14/2014	6,595.82
01/15/2014	02/17/2014	7,520.08
02/18/2014	03/20/2014	5,411.39 estimate
Total Consumption (therms):		39,246.93
Total Consumption (kBtu (thousand Btu)):		3,924,693

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
(____)____-____



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



ENERGY STAR® Statement of Energy Performance

65

ENERGY STAR®
Score¹

Wayne Township Municipal Building

Primary Property Function: Office
Gross Floor Area (ft²): 58,400
Built: 1960

For Year Ending: February 28, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Wayne Township Municipal Building
475 Valley Road
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4060663

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

112.1 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	3,262,282 (50%)
Natural Gas (kBtu)	3,286,964 (50%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	134.2
National Median Source EUI (kBtu/ft²)	280.6
% Diff from National Median Source EUI	-16%

Source EUI

234.5 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	588
--	-----

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

,
() -



Professional Engineer Stamp
(if applicable)

ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

DPW Garage

Primary Function:
Gross Floor Area ():
Built: 1967

For Year Ending: 02/28/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

DPW Garage
201 Dey Road
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4060744

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: DPW Garage

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function:

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

201 Dey Road
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area:

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If “no” please specify what space has been excluded.

5) Annual Occupancy: 85

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	767,700 (30%)
Natural Gas (kBtu)	1,764,691.6 (70%)
Total Energy (kBtu)	2,532,391.5

National Median Comparison

National Median Site EUI ()
National Median Source EUI ()

Energy IntensitySite ()
Source ()% Diff from National Median Source
EUI

%

Emissions (based on site energy use)Greenhouse Gas Emissions (MtCO₂e) 190.9**Power Generation Plant or Distribution Utility:**

Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas	Natural Gas	02/13/2013	In Use	DPW Garage
Electric Grid Meter	Electric	02/13/2013	In Use	DPW Garage

Total Energy Use☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:**Natural Gas Meter: Natural Gas (therms)****Associated With:** DPW Garage

Start Date	End Date	Usage
02/13/2013	03/16/2013	2,824.41
03/16/2013	04/16/2013	1,799.06
04/16/2013	05/15/2013	325.22
05/15/2013	06/15/2013	11
06/15/2013	07/16/2013	11
07/16/2013	08/14/2013	0
08/14/2013	09/13/2013	0
09/13/2013	10/14/2013	119.85
10/14/2013	11/12/2013	1,086.13
11/12/2013	12/13/2013	2,502.42
12/13/2013	01/14/2014	3,771.62
01/14/2014	02/14/2014	5,084.85
02/14/2014	03/13/2014	2,824.41
Total Consumption (therms):		20,359.97
Total Consumption (kBtu (thousand Btu)):		2,035,997

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: DPW Garage

Start Date	End Date	Usage	Green Power?
02/13/2013	03/13/2013	17,400	No
03/13/2013	04/16/2013	17,400	No
04/16/2013	05/15/2013	15,800	No
05/15/2013	06/17/2013	21,600	No
06/17/2013	07/16/2013	18,600	No
07/16/2013	08/14/2013	19,400	No
08/14/2013	09/13/2013	20,200	No
09/13/2013	10/12/2013	16,200	No

Start Date	End Date	Usage	Green Power?
10/12/2013	11/12/2013	16,200	No
11/12/2013	12/13/2013	19,400	No
12/13/2013	01/14/2014	22,600	No
01/14/2014	02/13/2014	20,200	No
02/13/2014	03/13/2014	17,400	No
Total Consumption (kWh (thousand Watt-hours)):			242,400
Total Consumption (kBtu (thousand Btu)):			827,068.8

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
(____)____-____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.



Professional Engineer Stamp

(if applicable)



ENERGY STAR® Statement of Energy Performance

N/A

DPW Garage

Primary Property Function:
Gross Floor Area (ft): 0
Built: 1967

ENERGY STAR®
Score¹

For Year Ending: February 28, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

DPW Garage
201 Dey Road
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4060744

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

N/A

Annual Energy by Fuel

Electric - Grid (kBtu) 767,700 (30%)
Natural Gas (kBtu) 1,764,692 (70%)

National Median Comparison

National Median Site EUI () N/A
National Median Source EUI () N/A
% Diff from National Median Source EUI N/A%

Source EUI

N/A

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO₂e/year) 191

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

,
() -



Professional Engineer Stamp
(if applicable)

ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Mountain View WPCF (Dry-Wet)

Primary Function: Wastewater Treatment Plant
Gross Floor Area (ft²): 84,000
Built: 1982

For Year Ending: 02/28/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Mountain View WPCF (Dry-Wet)
205 Dey Road
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4060758

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Mountain View WPCF (Dry-Wet)

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: Wastewater Treatment Plant

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

205 Dey Road
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 84,000 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 85

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

Wastewater Treatment Plant: Building Use

1) Gross Floor Area: 74,000 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. For Drinking Water Treatment & Distribution plants, Gross Floor Area is not a typical value used to normalize, but is required as a basic system input. Area should reflect interior spaces only and should not include exterior portions of the facility such as retention or settling ponds. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Plant Design Flow Rate: 13.5

Is this the capacity for which a water or wastewater treatment facility has been designed?

☐ Yes ☐ No

3) Average Influent Biological Oxygen Demand (BOD5): Not entered

Is this the BOD5 concentration of wastewater when it is entering a Wastewater Treatment Plant to be treated? The concentration should be an average concentration, estimated over a 12-month period. BOD is the measure of the amount of oxygen required by bacteria for stabilizing material that can be decomposed under aerobic conditions. BOD5 is a commonly used determinant of the organic strength of a waste, recording the oxygen demand over a five day period. BOD5 should be reported in mg/l. BOD5 is not the same as CBOD5 (the carbonaceous biological oxygen demand). To receive an ENERGY STAR score, you must report BOD5, not CBOD5, for your wastewater treatment plant.

☐ Yes ☐ No

4) Average Effluent Biological Oxygen Demand (BOD5): Not entered

Is this the BOD5 concentration of wastewater after it is treated and is leaving a Wastewater Treatment Plant? The concentration should be an average concentration, estimated over a 12-month period. BOD is the measure of the amount of oxygen required by bacteria for stabilizing material that can be decomposed under aerobic conditions. BOD5 is a commonly used determinant of the organic strength of a waste, recording the oxygen demand over a five-day period. BOD5 should be reported in mg/l. BOD5 is not the same as CBOD5 (carbonaceous biological oxygen demand). To receive an ENERGY STAR score, you must report BOD5, not CBOD5, for your wastewater treatment plant.

☐ Yes ☐ No

5) Fixed Film Trickle Filtration Process: No

Does the plant use Trickle Filtration as a method of biological treatment? Trickle Filtration is a process used to reduce Biological Oxygen Demand (BOD) and ammonia nitrogen levels. Trickling filters are composed of a bed of porous material (rocks, slag, plastic media, or any other medium with a high surface area and high permeability). Wastewater is distributed over the surface of the media, where it flows downward as a thin film over the media surface for aerobic treatment. The wastewater is then collected at the bottom through an under-drain system. The effluent is then settled by gravity to remove biological solids prior to being discharged.

☐ Yes ☐ No

6) Nutrient Removal: No

Does the plant use a nutrient removal process(es)? Nutrient removal is considered to be any process included for the purpose of removing nutrients (i.e., nitrogen, phosphorous). This may include biological nitrification, biological denitrification, phosphorus removal, or recirculating sand filters. This same question about nutrient removal is asked in EPA's Community Watershed Needs Survey.

☐ Yes ☐ No

Notes:

Office: Office Use

1) Gross Floor Area: 10,000 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

☐ Yes ☐ No

2) Weekly Operating Hours: 40

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. It is possible that these hours may correspond to hours specified within a lease, during which the owner is required to provide the leasee with conditioned space. However, this number should never include additional HVAC startup or shutdown time. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Number of Computers: 20

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

4) Number of Workers on Main Shift: 20

Is this the total number of workers present during the primary shift? This is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.

☐ Yes ☐ No

5) Percent That Can Be Heated: 100

Is this the total percentage of the property that can be heated by mechanical equipment?

☐ Yes ☐ No

6) Percent That Can Be Cooled: 100

Is this the total percentage of the property that can be cooled by mechanical equipment?
This includes all types of cooling from central air to individual window units.

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption**Data Overview****Site Energy Use Summary**

Electric - Grid (kBtu)	15,518,245.6 (82%)
Natural Gas (kBtu)	1,866,274.2 (10%)
Fuel Oil (No. 2) (kBtu)	1,656,000.1 (9%)
Total Energy (kBtu)	19,040,519.9

Energy Intensity

Site (kBtu/ft ²)	226.7
Source (kBtu/ft ²)	623.3

National Median Comparison

National Median Site EUI ()	
National Median Source EUI ()	
% Diff from National Median Source EUI	%

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e)	2,187.1
--	---------

Power Generation Plant or Distribution Utility:

Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas #2	Natural Gas	02/13/2013	In Use	Mountain View WPCF (Dry-Wet)
Electric Grid Meter	Electric	02/14/2013	In Use	Mountain View WPCF (Dry-Wet)
Natural Gas #1	Natural Gas	02/13/2013	In Use	Mountain View WPCF (Dry-Wet)
Fuel Oil (No. 2)	Fuel Oil No 2	03/15/2013	In Use	Mountain View WPCF (Dry-Wet)

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Natural Gas Meter: Natural Gas #2 (therms)

Associated With: Mountain View WPCF (Dry-Wet)

Start Date	End Date	Usage
02/13/2013	03/13/2013	961.28
03/13/2013	04/16/2013	547.2
04/16/2013	05/15/2013	0
05/15/2013	06/17/2013	0
06/17/2013	07/16/2013	0
07/16/2013	08/14/2013	0
08/14/2013	09/13/2013	0
09/13/2013	10/12/2013	0
10/12/2013	11/12/2013	120.78
11/12/2013	12/13/2013	1,763.26
12/13/2013	01/14/2014	3,502.29
01/14/2014	02/13/2014	4,193.06
02/13/2014	03/13/2014	961.28 estimate
Total Consumption (therms):		12,049.15
Total Consumption (kBtu (thousand Btu)):		1,204,915

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Mountain View WPCF (Dry-Wet)

Start Date	End Date	Usage	Green Power?
02/14/2013	03/15/2013	410,628	No
03/16/2013	04/16/2013	412,120	No
04/17/2013	05/15/2013	321,244	No
05/16/2013	06/14/2013	341,336	No
06/15/2013	07/16/2013	385,161	No
07/17/2013	08/14/2013	375,019	No
08/15/2013	09/13/2013	376,391	No
09/14/2013	10/14/2013	349,210	No
10/15/2013	11/12/2013	350,387	No
11/13/2013	12/13/2013	384,847	No
12/14/2013	01/14/2014	425,580	No
01/15/2014	02/13/2014	402,527	No
02/13/2014	03/15/2014	410,628 estimate	No
Total Consumption (kWh (thousand Watt-hours)):			4,945,078
Total Consumption (kBtu (thousand Btu)):			16,872,606.1

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas #1 (therms)

Associated With: Mountain View WPCF (Dry-Wet)

Start Date	End Date	Usage
02/13/2013	03/13/2013	1,342.14
03/13/2013	04/16/2013	979.97
04/16/2013	05/15/2013	337.62
05/15/2013	06/17/2013	4.5
06/17/2013	07/16/2013	4.5
07/16/2013	08/14/2013	0
08/14/2013	09/13/2013	0
09/13/2013	10/12/2013	15.91
10/12/2013	11/12/2013	336.71
11/12/2013	12/13/2013	1,064.9
12/13/2013	01/14/2014	1,649.22
01/14/2014	02/13/2014	1,839.4
02/13/2014	03/13/2014	1,342.14 estimate
Total Consumption (therms):		8,917.01
Total Consumption (kBtu (thousand Btu)):		891,701

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Fuel Oil No 2 Meter: Fuel Oil (No. 2) (Gallons (US))

Associated With: Mountain View WPCF (Dry-Wet)

Delivery Date	Quantity
03/15/2013	0
04/16/2013	0
05/15/2013	0
06/14/2013	0
07/16/2013	0
08/14/2013	0
09/13/2013	0
10/14/2013	0
11/19/2013	3,000
12/11/2013	3,000
01/28/2014	1,000
02/18/2014	5,000
Total Consumption (Gallons (US)):	12,000
Total Consumption (kBtu (thousand Btu)):	1,656,000

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
(____)____-____



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR®
Score¹

Mountain View WPCF (Dry-Wet)

Primary Property Function: Wastewater Treatment Plant
Gross Floor Area (ft²): 84,000
Built: 1982

For Year Ending: February 28, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Mountain View WPCF (Dry-Wet)
205 Dey Road
Wayne, New Jersey 07470

Property Owner

, _____
() - _____

Primary Contact

, _____
() - _____

Property ID: 4060758

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

226.7 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	15,518,246 (82%)
Natural Gas (kBtu)	1,866,274 (10%)
Fuel Oil (No. 2) (kBtu)	1,656,000 (9%)

National Median Comparison

National Median Site EUI ()	N/A
National Median Source EUI ()	N/A
% Diff from National Median Source EUI	N/A%

Source EUI

623.3 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	2,187
--	-------

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

, _____
() - _____



Professional Engineer Stamp
(if applicable)

ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Wayne Public Library

Primary Function: Library
Gross Floor Area (ft²): 37,554
Built: 1964

For Year Ending: 02/28/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Wayne Public Library
461 Valley Road
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4067646

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Wayne Public Library

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: Library

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

461 Valley Road
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 37,554 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 90

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

Library: Building Use

1) Gross Floor Area: 37,554 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 40

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Number of Workers on Main Shift: 25

Is this the total number of workers present during the primary shift? This is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.

☐ Yes ☐ No

4) Number of Computers: 116

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Natural Gas (kBtu)	2,829,815.9 (58%)
Electric - Grid (kBtu)	2,058,085.2 (42%)
Total Energy (kBtu)	4,887,901.1

Energy Intensity

Site (kBtu/ft ²)	130.2
Source (kBtu/ft ²)	251.2

National Median Comparison

National Median Site EUI (kBtu/ft ²)	122.1
National Median Source EUI (kBtu/ft ²)	235.6
% Diff from National Median Source EUI	6.62%

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e)	410.8
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Power Generation Plant or Distribution Utility:

Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Grid Meter	Electric	02/13/2013	In Use	Wayne Public Library
Natural Gas	Natural Gas	02/13/2013	In Use	Wayne Public Library

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Wayne Public Library

Start Date	End Date	Usage	Green Power?
02/13/2013	03/15/2013	39,800	No
03/15/2013	04/16/2013	40,600	No
04/16/2013	05/15/2013	40,800	No
05/15/2013	06/14/2013	57,072.93	No
06/14/2013	07/16/2013	69,600	No

Start Date	End Date	Usage	Green Power?
07/16/2013	08/14/2013	68,934.12	No
08/14/2013	09/13/2013	65,539.43	No
09/13/2013	10/14/2013	51,282.2	No
10/14/2013	11/12/2013	46,823.45	No
11/12/2013	12/13/2013	42,364.7	No
12/13/2013	01/14/2014	41,401.37	No
01/14/2014	02/13/2014	40,940.66	No
02/14/2014	03/16/2014	39,800 estimate	No
Total Consumption (kWh (thousand Watt-hours)):			644,958.86
Total Consumption (kBtu (thousand Btu)):			2,200,599.6

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas (therms)

Associated With: Wayne Public Library

Start Date	End Date	Usage
02/13/2013	03/15/2013	4,851.19
03/15/2013	04/16/2013	3,605.08
04/16/2013	05/15/2013	1,019.34
05/15/2013	06/14/2013	214
06/14/2013	07/16/2013	0
07/16/2013	08/14/2013	0
08/14/2013	09/13/2013	0
09/13/2013	10/14/2013	10
10/14/2013	11/12/2013	2,545.83
11/12/2013	12/13/2013	4,654.79
12/13/2013	01/14/2014	5,595.1
01/15/2014	02/17/2014	6,668.74

Start Date	End Date	Usage
02/18/2014	03/20/2014	4,851.19 estimate
Total Consumption (therms):		34,015.26
Total Consumption (kBtu (thousand Btu)):		3,401,526

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
() - _____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.



Professional Engineer Stamp
(if applicable)



ENERGY STAR® Statement of Energy Performance

N/A

Wayne Public Library

Primary Property Function: Library
Gross Floor Area (ft²): 37,554
Built: 1964

**ENERGY STAR®
Score¹**

For Year Ending: February 28, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Wayne Public Library
461 Valley Road
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4067646

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

130.2 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,829,816 (58%)
Electric - Grid (kBtu)	2,058,085 (42%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	122.1
National Median Source EUI (kBtu/ft²)	235.6
% Diff from National Median Source EUI	7%

Source EUI

251.2 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	411
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Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

,
() -



**Professional Engineer Stamp
(if applicable)**

ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Alps Road Water Pump Station

Primary Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 2,200
Built: 1969

For Year Ending: 01/31/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Alps Road Water Pump Station
1163 Alps Road
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4062303

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Alps Road Water Pump Station

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: Drinking Water Treatment & Distribution

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

1163 Alps Road
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 2,200 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 20

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

Drinking Water Treatment & Distribution: Building Use

1) Gross Floor Area: 2,200 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. For Drinking Water Treatment & Distribution plants, Gross Floor Area is not a typical value used to normalize, but is required as a basic system input. Area should reflect interior spaces only and should not include exterior portions of the facility such as retention or settling ponds. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu) 1,601,902.1 (100%)
Total Energy (kBtu) 1,601,902.1

Energy Intensity

Site (kBtu/ft²) 728.1
Source (kBtu/ft²) 2,286.4

National Median Comparison

National Median Site EUI ()
National Median Source EUI ()
% Diff from National Median Source EUI %

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO2e) 202.9

Power Generation Plant or Distribution Utility:

Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Grid Meter	Electric	12/01/2012	In Use	Alps Road Water Pump Station

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Alps Road Water Pump Station

Start Date	End Date	Usage	Green Power?
01/14/2013	02/14/2013	42,160 estimate	No
02/14/2013	03/18/2013	23,120	No
03/18/2013	04/17/2013	28,480	No
04/17/2013	05/16/2013	28,160	No
05/16/2013	06/17/2013	32,880	No
06/17/2013	07/17/2013	33,440	No
07/17/2013	08/15/2013	64,960	No
08/15/2013	09/16/2013	62,560	No
09/16/2013	10/15/2013	51,200	No
10/15/2013	11/13/2013	33,600	No
11/13/2013	12/16/2013	34,080	No
12/16/2013	01/15/2014	35,440	No
01/15/2014	02/14/2014	42,160	No
		Total Consumption (kWh (thousand Watt-hours)):	512,240
		Total Consumption (kBtu (thousand Btu)):	1,747,762.9

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
(____)____-____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR®
Score¹

Alps Road Water Pump Station

Primary Property Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 2,200
Built: 1969

For Year Ending: January 31, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Alps Road Water Pump Station
1163 Alps Road
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4062303

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

728.1 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu) 1,601,902 (100%)

National Median Comparison

National Median Site EUI () N/A
National Median Source EUI () N/A
% Diff from National Median Source EUI N/A%

Source EUI

2,286.4 kBtu/
ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year) 203

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

,
() -



Professional Engineer Stamp
(if applicable)

ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Jacobus Water Pump Station

Primary Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 2,200
Built: 1969

For Year Ending: 02/28/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Jacobus Water Pump Station
40 Jacobus Avenue
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4061791

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Jacobus Water Pump Station

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: Drinking Water Treatment & Distribution

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

40 Jacobus Avenue
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 2,200 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 20

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

Drinking Water Treatment & Distribution: Building Use

1) Gross Floor Area: 2,200 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. For Drinking Water Treatment & Distribution plants, Gross Floor Area is not a typical value used to normalize, but is required as a basic system input. Area should reflect interior spaces only and should not include exterior portions of the facility such as retention or settling ponds. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu) 5,401,332.4 (100%)
Total Energy (kBtu) 5,401,332.4

Energy Intensity

Site (kBtu/ft²) 2,455.2
Source (kBtu/ft²) 7,709.2

National Median Comparison

National Median Site EUI ()
National Median Source EUI ()
% Diff from National Median Source EUI %

Emissions (based on site energy use)
Greenhouse Gas Emissions (MtCO₂e) 684

Power Generation Plant or Distribution Utility:
Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Grid Meter	Electric	02/13/2013	In Use	Jacobus Water Pump Station

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels☐ Yes ☐ No

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Jacobus Water Pump Station

Start Date	End Date	Usage	Green Power?
02/13/2013	03/15/2013	99,520	No
03/15/2013	04/16/2013	112,320	No
04/16/2013	05/15/2013	115,680	No
05/15/2013	06/14/2013	124,640	No
06/14/2013	07/16/2013	141,120	No
07/16/2013	08/14/2013	158,880	No
08/14/2013	09/13/2013	155,600	No
09/13/2013	10/14/2013	157,920	No
10/14/2013	11/12/2013	126,400	No
11/12/2013	12/13/2013	126,560	No
12/13/2013	01/14/2014	133,760	No
01/14/2014	02/13/2014	130,640	No
02/13/2014	03/15/2014	99,520 estimate	No
		Total Consumption (kWh (thousand Watt-hours)):	1,682,560
		Total Consumption (kBtu (thousand Btu)):	5,740,894.7

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
(____)____-____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR®
Score¹

Jacobus Water Pump Station

Primary Property Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 2,200
Built: 1969

For Year Ending: February 28, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Jacobus Water Pump Station
40 Jacobus Avenue
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4061791

Energy Consumption and Energy Use Intensity (EUI)

Site EUI	Annual Energy by Fuel	National Median Comparison	
2,455.2 kBtu/ft²	Electric - Grid (kBtu) 5,401,332 (100%)	National Median Site EUI ()	N/A
		National Median Source EUI ()	N/A
		% Diff from National Median Source EUI	N/A%
Source EUI		Annual Emissions	
7,709.2 kBtu/ft²		Greenhouse Gas Emissions (Metric Tons CO2e/year)	684

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

,
() -



Professional Engineer Stamp
(if applicable)

ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Lower Preakness Sewer Pump Station

Primary Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 2,200
Built: 1980

For Year Ending: 02/28/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Lower Preakness Sewer Pump Station
180 Dey Road
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4062292

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Lower Preakness Sewer Pump Station

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: Drinking Water Treatment & Distribution

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

180 Dey Road
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 2,200 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 20

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

Drinking Water Treatment & Distribution: Building Use

1) Gross Floor Area: 2,200 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. For Drinking Water Treatment & Distribution plants, Gross Floor Area is not a typical value used to normalize, but is required as a basic system input. Area should reflect interior spaces only and should not include exterior portions of the facility such as retention or settling ponds. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu) 1,277,786.4 (100%)
Total Energy (kBtu) 1,277,786.4

Energy Intensity

Site (kBtu/ft²) 580.8
Source (kBtu/ft²) 1,823.8

National Median Comparison

National Median Site EUI ()
National Median Source EUI ()
% Diff from National Median Source EUI %

Emissions (based on site energy use)
Greenhouse Gas Emissions (MtCO₂e) 161.8

Power Generation Plant or Distribution Utility:
Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Grid Meter	Electric	02/14/2013	In Use	Lower Preakness Sewer Pump Station

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels☐ Yes ☐ No

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Lower Preakness Sewer Pump Station

Start Date	End Date	Usage	Green Power?
02/14/2013	03/15/2013	26,578	No
03/15/2013	04/15/2013	26,578	No
04/15/2013	05/15/2013	33,600	No
05/16/2013	06/15/2013	33,400	No
06/15/2013	07/13/2013	33,400	No
07/13/2013	08/13/2013	26,000	No
08/13/2013	09/13/2013	26,000	No
09/13/2013	10/13/2013	31,066.67	No
10/13/2013	11/13/2013	31,066.67	No
11/13/2013	12/13/2013	31,066.67	No
12/13/2013	01/14/2014	38,400	No
01/14/2014	02/13/2014	37,800	No
02/14/2014	03/15/2014	26,578 estimate	No
Total Consumption (kWh (thousand Watt-hours)):			401,534.01
Total Consumption (kBtu (thousand Btu)):			1,370,034

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
(____)____-____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR®
Score¹

Lower Preakness Sewer Pump Station

Primary Property Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 2,200
Built: 1980

For Year Ending: February 28, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Lower Preakness Sewer Pump Station
180 Dey Road
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4062292

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

580.8 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu) 1,277,786 (100%)

National Median Comparison

National Median Site EUI () N/A
National Median Source EUI () N/A
% Diff from National Median Source EUI N/A%

Source EUI

1,823.8 kBtu/
ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year) 162

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

,
() -



Professional Engineer Stamp
(if applicable)

ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Sheffield Sewer Pump Station

Primary Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 2,000
Built: 1978

For Year Ending: 03/31/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Sheffield Sewer Pump Station
14 Farmingdale Road
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4062298

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Sheffield Sewer Pump Station

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: Drinking Water Treatment & Distribution

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

14 Farmingdale Road
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 2,000 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 20

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

Drinking Water Treatment & Distribution: Building Use

1) Gross Floor Area: 2,000 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. For Drinking Water Treatment & Distribution plants, Gross Floor Area is not a typical value used to normalize, but is required as a basic system input. Area should reflect interior spaces only and should not include exterior portions of the facility such as retention or settling ponds. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu) 1,048,631.7 (100%)
Total Energy (kBtu) 1,048,631.7

Energy Intensity

Site (kBtu/ft²) 524.3
Source (kBtu/ft²) 1,646.4

National Median Comparison

National Median Site EUI ()
National Median Source EUI ()
% Diff from National Median Source EUI %

Emissions (based on site energy use)
Greenhouse Gas Emissions (MtCO2e) 132.8

Power Generation Plant or Distribution Utility:
Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Grid Meter	Electric	03/08/2013	In Use	Sheffield Sewer Pump Station

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels☐ Yes ☐ No

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Sheffield Sewer Pump Station

Start Date	End Date	Usage	Green Power?
03/25/2013	05/07/2013	26,800	No
05/08/2013	06/07/2013	23,760	No
06/08/2013	07/09/2013	17,800	No
07/10/2013	08/06/2013	51,600	No
08/07/2013	09/06/2013	21,880	No
09/07/2013	10/07/2013	22,200	No
10/08/2013	11/06/2013	21,320	No
11/07/2013	12/06/2013	22,720	No
12/07/2013	01/08/2014	33,920	No
01/09/2014	02/06/2014	25,920	No
02/07/2014	03/06/2014	20,480	No
03/07/2014	03/31/2014	23,200 estimate	No
		Total Consumption (kWh (thousand Watt-hours)):	311,600
		Total Consumption (kBtu (thousand Btu)):	1,063,179.2

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
(____)____-____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR®
Score¹

Sheffield Sewer Pump Station

Primary Property Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 2,000
Built: 1978

For Year Ending: March 31, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Sheffield Sewer Pump Station
14 Farmingdale Road
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4062298

Energy Consumption and Energy Use Intensity (EUI)

Site EUI	Annual Energy by Fuel	National Median Comparison	
524.3 kBtu/ft²	Electric - Grid (kBtu) 1,048,632 (100%)	National Median Site EUI ()	N/A
		National Median Source EUI ()	N/A
		% Diff from National Median Source EUI	N/A%
Source EUI	Annual Emissions		
1,646.4 kBtu/ft²	Greenhouse Gas Emissions (Metric Tons CO2e/year)	133	

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

,
() -



Professional Engineer Stamp
(if applicable)

ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Wanaque Water Pump Station

Primary Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 800
Built: 1978

For Year Ending: 03/31/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Wanaque Water Pump Station
529 Newark Pompton Tpke
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4061548

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Wanaque Water Pump Station

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: Drinking Water Treatment & Distribution

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

529 Newark Pompton Tpke
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 800 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 20

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

Drinking Water Treatment & Distribution: Building Use

1) Gross Floor Area: 800 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. For Drinking Water Treatment & Distribution plants, Gross Floor Area is not a typical value used to normalize, but is required as a basic system input. Area should reflect interior spaces only and should not include exterior portions of the facility such as retention or settling ponds. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu) 3,543,508.1 (100%)
Total Energy (kBtu) 3,543,508.1

Energy Intensity

Site (kBtu/ft²) 4,429.4
Source (kBtu/ft²) 13,908.3

National Median Comparison

National Median Site EUI ()
National Median Source EUI ()
% Diff from National Median Source EUI %

Emissions (based on site energy use)
Greenhouse Gas Emissions (MtCO₂e) 448.7

Power Generation Plant or Distribution Utility:
Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Grid Meter	Electric	03/13/2013	In Use	Wanaque Water Pump Station

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels☐ Yes ☐ No

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Wanaque Water Pump Station

Start Date	End Date	Usage	Green Power?
03/13/2013	04/09/2013	69,320	No
04/10/2013	05/10/2013	50,760	No
05/11/2013	06/11/2013	38,560	No
06/12/2013	07/09/2013	172,120	No
07/10/2013	08/12/2013	205,400	No
08/13/2013	09/09/2013	79,720	No
09/10/2013	10/09/2013	81,880	No
10/10/2013	11/12/2013	84,040	No
11/12/2013	12/12/2013	45,560	No
12/12/2013	01/09/2014	64,320	No
01/10/2014	02/10/2014	73,880	No
02/11/2014	03/08/2014	63,080	No
03/09/2014	04/05/2014	69,320 estimate	No
Total Consumption (kWh (thousand Watt-hours)):			1,097,960
Total Consumption (kBtu (thousand Btu)):			3,746,239.5

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
(____)____-____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR®
Score¹

Wanaque Water Pump Station

Primary Property Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 800
Built: 1978

For Year Ending: March 31, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

Wanaque Water Pump Station
529 Newark Pompton Tpke
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4061548

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

4,429.4 kBtu/
ft²

Annual Energy by Fuel

Electric - Grid (kBtu) 3,543,508 (100%)

National Median Comparison

National Median Site EUI () N/A
National Median Source EUI () N/A
% Diff from National Median Source EUI N/A%

Source EUI

13,908.3
kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year) 449

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

,
() -



**Professional Engineer Stamp
(if applicable)**

ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

West Belt Water Pump Station

Primary Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 3,000
Built: 1991

For Year Ending: 01/31/2014
Date Generated: 06/16/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

West Belt Water Pump Station
70 West Belt
Wayne, New Jersey 07470

Property Owner

() -

Primary Contact

() -

Property ID: 4061288

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: West Belt Water Pump Station

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: Drinking Water Treatment & Distribution

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

70 West Belt
Wayne, New Jersey 07470

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 3,000 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 20

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

Drinking Water Treatment & Distribution: Building Use

1) Gross Floor Area: 3,000 ft²

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. For Drinking Water Treatment & Distribution plants, Gross Floor Area is not a typical value used to normalize, but is required as a basic system input. Area should reflect interior spaces only and should not include exterior portions of the facility such as retention or settling ponds. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu) 8,985,774.9 (100%)
Total Energy (kBtu) 8,985,774.9

Energy Intensity

Site (kBtu/ft²) 2,995.3
Source (kBtu/ft²) 9,405.1

National Median Comparison

National Median Site EUI ()
National Median Source EUI ()
% Diff from National Median Source EUI %

Emissions (based on site energy use)
Greenhouse Gas Emissions (MtCO2e) 1,137.9

Power Generation Plant or Distribution Utility:
Public Service Electric & Gas Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Grid Meter	Electric	02/01/2013	In Use	West Belt Water Pump Station

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels☐ Yes ☐ No

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: West Belt Water Pump Station

Start Date	End Date	Usage	Green Power?
02/01/2013	02/28/2013	131,328	No
03/01/2013	03/31/2013	141,505	No
04/01/2013	04/30/2013	146,304	No
05/01/2013	05/31/2013	219,921	No
06/01/2013	06/30/2013	245,538	No
07/01/2013	07/31/2013	302,171	No
08/01/2013	08/31/2013	272,288	No
09/01/2013	09/30/2013	252,187	No
10/01/2013	10/31/2013	232,258	No
11/01/2013	11/30/2013	186,007	No
12/01/2013	12/31/2013	244,195	No
01/01/2014	01/31/2014	259,878	No
		Total Consumption (kWh (thousand Watt-hours)):	2,633,580
		Total Consumption (kBtu (thousand Btu)):	8,985,775

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

,
(____)____-____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR®
Score¹

West Belt Water Pump Station

Primary Property Function: Drinking Water Treatment & Distribution
Gross Floor Area (ft²): 3,000
Built: 1991

For Year Ending: January 31, 2014
Date Generated: June 16, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address

West Belt Water Pump Station
70 West Belt
Wayne, New Jersey 07470

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4061288

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

2,995.3 kBtu/
ft²

Annual Energy by Fuel

Electric - Grid (kBtu) 8,985,775 (100%)

National Median Comparison

National Median Site EUI () N/A
National Median Source EUI () N/A
% Diff from National Median Source EUI N/A%

Source EUI

9,405.1 kBtu/
ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year) 1,138

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

,
() -



Professional Engineer Stamp
(if applicable)



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

EQUIPMENT INVENTORY LISTS

DPW GARAGE			
HVAC SYSTEMS			
Tag#	RTU-1	MAU	
Location	Main Office Roof	Upstairs of the Main Garage	
Quantity	1	1	
Area Serving	Lunch Room	Main Garage	
Mfg.	-	Reznor	
Model	-	PAK2- S - SMV	
Serial Number	-	3A E2S6R009	
Cooling Source	-	None	
Cooling Capacity (tons)	3 (Estimated)	-	
Cooling EER	9	-	
Heating Source	None	Indirect Gas	
Heating Capacity input - MBH	-	-	
Furnace Efficiency	-	-	
Supply Fan Motor HP	0.5 HP (Est)	5	
Motor Efcy	85% (Est)	-	
Other Fan Motor HP	-	N/A	
Motor Efcy	-	-	
Flow Type	-	Constant Volume	
Outside Air Economizer	None	N/A	
Year Manufactured	2005 (Est)	-	
Age	9	-	
Estimated Service Life	15	15	
Remaining Life	6	-	
Notes	The unit is not accesible without lift.	Constant volume makeup air unit.	
	Small unit serving a small lunch room. Capacity estimated	No VFD required. Reduction in flow will violate minimum ventilation requirements	

N/A Not Applicable

- Not Available

DPW GARAGE			
HVAC SYSTEMS			
Tag#	Condensing Unit	Condensing Unit	AC Unit
Location	Outside in front of Office Entrance	Outside in front of Office Entrance	Outside the Road Former's Office
Quantity	1	1	1
Area Serving	Office Area	Office Area	Road Former's Office
Mfg.	Lennox	Lennox	Mitsubishi- Mr. Slim
Model	LSA072C-1Y	HS26-060-2Y	MUZ-GE15NA
Serial Number	5698F 06555	5898G 11567	3002322
Cooling Source	Electric	Electric	Electric
Cooling Capacity (tons)	6	5	1.5 (Est)
Cooling EER	-	12 (EER) 13.60 (SEER)	21 (SEER)
Heating Source	-	-	-
Heating Capacity input - MBH	-	-	-
Fan HP	0.5	0.25	-
Year Manufactured	1998	1998	-
Age	16	16	-
Estimated Service Life	20	20	20
Remaining Life	4	4	-
Notes	-	-	R-401A
	Main Office AC	Main Office AC	

N/A Not Applicable
 - Not Available

[illegible]

HVAC SYSTEMS

[illegible]

N/A Not Applicable

- Not Available

DPW GARAGE			
DOMESTIC WATER HEATERS			
Tag#	Water Heater		
Location	Boiler Room		
Quantity	1		
Area Serving	Bathrooms		
Mfg.	A.O. Smith		
Model	ECT 80 200		
Serial Number	L04A071509		
Capacity, Gal	80		
Fuel	Electric		
Type	Tank Type Standard Efficiency		
Heating Capacity, MBH	-		
Recovery Rate, GPH	21		
Efficiency	80%		
Year Manufactured	2004		
Age	10		
Estimated Service Life	15		
Remaining Life	5		
Hot Water Circulator	N/A		
Notes			

N/A Not Applicable
 - Not Available

WAYNE TOWNSHIP LIBRARY			
PACKAGED ROOFTOP UNITS			
Tag#	RTU-1	RTU-2	RTU-3
Location	Rooftop-Library	Rooftop-Library	Rooftop-Library
Quantity	1	1	1
Area Serving	Library Upstairs, Sitting Area	Library Upstairs, Sitting Area	Main Library
Mfg.	Carrier	Trane	Carrier
Model	48EJE028	YSD210F3RHA00D000000000000000000000000	48HJF015
Serial Number	0599F96318	124110340D	1299F07143
Cooling Source	DX Cooling	DX Cooling	DX Cooling
Cooling Capacity (tons)	25	17.5	12
Cooling EER	9.6	9.6	10.6
Heating Source	Natural Gas	Natural Gas	Natural Gas
Heating Capacity input - MBH	525	250	300
Furnace Efficiency	81%	81%	81%
Supply Fan Motor HP	7.5	5	5
Motor Efcy	-	-	-
Other Fan Motor HP	4x1HP = 4 HP 2x1HP = 2HP		3 X 0.5 HP = 1.5 HP
Motor Efcy	-	-	-
Flow Type	Constant Volume	Constant Volume	Constant Volume
Outside Air Economizer	100%	100%	100%
Year Manufactured	1999	2012	1999
Age	15	2	15
Estimated Service Life	15	15	15
Remaining Life	0	13	0
Notes	-	New	-
N/A Not Applicable - Not Available			

WAYNE TOWNSHIP LIBRARY			
PACKAGED ROOFTOP UNITS			
Tag#	RTU-4	RTU-5	RTU-6
Location	Rooftop-Library	Rooftop-Library	Rooftop-Library
Quantity	1	1	1
Area Serving	Children's Room	Meeting Rooms A&B	The Front Portion of the Library
Mfg.	Carrier	Carrier	Carrier
Model Number	48EJE028	48EJE028	48HJF025
Serial Number	0599F96324	0599F96287	0599F96102
Cooling Source	DX Cooling	DX Cooling	DX Cooling
Cooling Capacity (tons)	25	25	20
Cooling EER	9.6	9.6	-
Heating Source	Natural Gas	Natural Gas	Natural Gas
Heating Capacity input - MBH	525	525	360
Furnace Efficiency	81%	81%	81%
Supply Fan Motor HP	7.5	7.5	10
Motor Efcy	-	-	-
Other Fan Motor HP	2 x 1 HP = 2 HP 4 x 1 = 4 HP	2 x 1 HP = 2 HP 4 x 1 = 4 HP	2 x 1 HP = 2 HP
Motor Efcy	-	-	-
Flow Type	Constant Volume	Constant Volume	Constant Volume
100% Outside Air Economizer	100%	100%	100%
Year Manufactured	1999	1999	1999
Age	15	15	15
Estimated Service Life	15	15	15
Remaining Life	0	0	0
Notes	-	-	
N/A Not Applicable - Not Available			

WAYNE TOWNSHIP LIBRARY			
PACKAGED ROOFTOP UNITS			
Tag#	RTU-7	RTU-8	RTU-9
Location	Rooftop-Library	Rooftop-Library	Rooftop-Library
Quantity	1	1	1
Area Serving	Back Offices of the Library	Library Garage	Main Library
Mfg.	Carrier	Trane	Carrier
Model Number	48HJE006 ---531---	-	48HJF015
Serial Number	4698G20483	-	1299F07144
Cooling Source	DX Cooling	DX Cooling	DX Cooling
Cooling Capacity (tons)	5	15	12
Cooling EER	11	-	10.6
Heating Source	Natural Gas	Natural Gas	Natural Gas
Heating Capacity input - MBH	115	-	300
Furnace Efficiency	81%	-	81%
Supply Fan Motor HP	7.5	-	5
Motor Efcy	-	-	-
Other Fan Motor HP	1 x 1.5 HP = 1.5 HP	-	3 X 0.5 HP = 1.5 HP
Motor Efcy	-	-	-
Flow Type	Constant Volume	Constant Volume	Constant Volume
100% Outside Air Economizer	100%	100%	100%
Year Manufactured	1989	-	1999
Age	25	-	15
Estimated Service Life	15	15	15
Remaining Life	-10	-	0
Notes		Equipment Tag washed out	
		Specifications Estimated	
N/A Not Applicable - Not Available			

WAYNE TOWNSHIP LIBRARY			
BOILER			
Tag#	Boiler		
Location	Library Boiler Room		
Quantity	1		
Area Serving	Library		
Mfg.	Crown Boiler		
Model	C247-800		
Serial Number	389800019		
Type of Boiler	Sectional Boiler		
Fuel	Natural Gas		
Output, MBH	640		
Input, MBH	800		
Efficiency	80%		
Year Manufactured	1999		
Age	15		
Estimated Service Life	25		
Remaining Life	10		
Notes	-		
N/A Not Applicable - Not Available			

WAYNE TOWNSHIP LIBRARY			
PUMPS			
Tag#	-		
Location	Library Boiler Room		
Quantity	4		
Area Serving	Library		
Mfg.	Bell&Gossett		
Model	M10532		
Serial Number	-		
Type	In-line circulator		
Flow, GPM	-		
Head, Ft	-		
Power, HP	0.25		
Motor Efcy	-		
RPM	1725		
Year Manufactured	-		
Age	-		
Estimated Service Life	20		
Remaining Life	-		
Notes	-		
N/A Not Applicable - Not Available			

WAYNE TOWNSHIP LIBRARY			
DOMESTIC WATER HEATERS			
Tag#	Water Heater		
Location	Library-Lunch Room		
Quantity	1		
Area Serving	Library		
Mfg.	Rheemglas Fury		
Model	82V30-2		
Serial Number	RH 0108234289		
Capacity, Gal	30		
Fuel	Electric		
Type	-		
Heating Capacity, MBH	-		
Recovery Rate, GPH	21		
Efficiency	85%		
Year Manufactured	2008		
Age	6		
Estimated Service Life	15		
Remaining Life	9		
Hot Water Circulator	-		
Notes	-		
N/A Not Applicable - Not Available			

WAYNE TOWNSHIP LIBRARY			
CONDENSING UNITS			
Tag#	CU-1 through CU-5		
Location	Library Roof		
Quantity	5		
Area Serving	Office Spaces		
Mfg.	Mitsubishi, Mr. Slim		
Model	MXZ-3A30NA		
Serial Number	61901220B		
Cooling Capacity, tons	2.8		
Fuel	Electric		
Type	Split Unit		
Heating Capacity, MBH	-		
Efficiency	8.7 EER		
Year Manufactured	-		
Age	-		
Estimated Service Life	20		
Remaining Life	-		
Notes			
N/A Not Applicable - Not Available			

WAYNE TOWNSHIP MUNICIPAL BUILDING			
AC UNITS			
Tag#	Police Desk	Police Hall	PARKS DEPT.
Location	Police Department	Police Department	Parks Dept
Quantity	1	1	1
Area Serving	Weapon Cleaning Room	Police Hall and Offices	Planing Department
Mfg.	Carrier	Carrier	York
Model	48TJD012-511-	48TJD020	D2NA060N11025D
Serial Number	0899G30747	0499F94290	NMLM129418
Cooling Source	None	DX Cooling	Electric
Cooling Capacity (tons)	10	18	5
Cooling EER	9	8.9	10 (SEER)
Heating Source	Natural Gas	Natural Gas	Natural Gas
Heating Capacity input - MBH	180	275	135
Furnace Efficiency	80%	81%	81%
Supply Fan Motor HP	3	5	-
Motor Efcy	-	-	-
Other Fan Motor HP	2 x 0.5	3 x 0.5 HP = 1.5 HP	1 x 1 HP = 1 HP
Motor Efcy	-	-	-
Flow Type	Constant Volume	Constant Volume	Constant Volume
Outside Air Economizer	100%	100%	100%
Year Manufactured	1999	1999	2002
Age	15	15	12
Estimated Service Life	15	15	15
Remaining Life	0	0	3
Notes			R-22

N/A Not Applicable

- Not Available

WAYNE TOWNSHIP MUNICIPAL BUILDING			
AC UNITS			
Tag#	ENG.-GIS	-	-
Location	Engineering Department	Roof - NE of Council Chamber	Roof - NE of Council Chamber
Quantity	1	1	1
Area Serving	Engineering Department	Computer Room (Evidence Room)	Records Department
Mfg.	York	Carrier	York
Model	D2NA060N11025D	38CKB060510	GCGD48S21S2C
Serial Number	NMLM129416	1295E16377	W1H3979102
Cooling Source	Electric	Electric	Electric
Cooling Capacity (tons)	5	5	4
Cooling EER	10 (SEER)	9	SEER 13
Heating Source	Natural Gas	N/A	N/A
Heating Capacity input - MBH	135	N/A	N/A
Furnace Efficiency	81%	1/4	1/4
Supply Fan Motor HP	-	-	-
Motor Efcy	-	-	-
Other Fan Motor HP	1	1/4	1/4
Motor Efcy	-		
Flow Type	Constant Volume		
Outside Air Economizer	100%	-	-
Year Manufactured	2002	1995	2013
Age	12	19	1
Estimated Service Life	15	20	20
Remaining Life	3	1	
Notes	R-22	R22	R22

N/A Not Applicable

- Not Available

WAYNE TOWNSHIP MUNICIPAL BUILDING			
AC UNITS			
Tag#	AC8 Hall	AC7 Building and Planning	AC6 Engineering
Location	Above Maint (NE of Council Chamber)	Roof - Building and Planning	Roof - Engineering
Quantity	1	1	1
Area Serving	Entry Hallway	Planning	Engineering
Mfg.	Carrier	Carrier	Carrier
Model Number	38AKS012---501	38AKS008---501--	38AKS012---501--
Serial Number	2796G00366	2596G00037	3495G00020
Cooling Source	Electric	Electric	Electric
Cooling Capacity (tons)	10	7.5	10
Cooling EER	10.6	11.5	10.6
Heating Source	N/A	N/A	N/A
Heating Capacity input - MBH	N/A	N/A	N/A
Fan HP	3/4	3/4	3/4
Year Manufactured	1996	1996	1995
Age	18	18	19
Estimated Service Life	20	20	20
Remaining Life	2	2	1
Notes	R22	R22	R22
Air Handler Tag#	AHU		
Quantity	1		
Area Serving	Council Chamber Hallway		
Location	Council Chamber Boiler Room		
Mfg.	-		
Air Handler Model	-		
Serial Number	-		
Cooling Source			

N/A Not Applicable

- Not Available

[illegible]

N/A Not Applicable
- Not Available

WAYNE TOWNSHIP MUNICIPAL BUILDING

AC UNITS	
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[illegible]

N/A Not Applicable

- Not Available

WAYNE TOWNSHIP MUNICIPAL BUILDING			
AC UNITS			
Tag#	CU1	CU2	-
Location	Roof	Health Wing Roof	Health Wing Roof
Quantity	1	1	1
Area Serving	Health	Health	Computer/TV Room
Mfg.	Carrier	ICP	Mitsubishi
Model Number	38CKB042500	N2A360GHB300	MUY-GE18NA
Serial Number	3496E15775	E093415164	20030603 T
Cooling Source	Electric	Electric	Electric
Cooling Capacity (tons)	3.5	3	1.5
Cooling EER	10.70 (Standard Rating - Estimated)	SEER 13.0	SEER 19.2
Heating Source	N/A	N/A	N/A
Heating Capacity input - MBH	N/A	N/A	N/A
Fan HP	1/4	1/4	-
Year Manufactured	1996	2009	2003
Age	18	5	11
Estimated Service Life	20	20	20
Remaining Life	2	15	9
Notes	R22	R22	R410A
Air Handler Tag#	AHU	AHU	AHU
Quantity	1	1	1
Area Serving	Health Department Offices	Health Department Offices	Health Department Offices
Location	Health Department Basement	Health Department Basement	Health Department Basement

N/A Not Applicable
 - Not Available

WAYNE TOWNSHIP MUNICIPAL BUILDING			
AC UNITS			
Tag#	CU	-	-
Location	Outside - NE Side Between Police and Admin	Outside - NE Side Between Police and Admin	Outside - Front of Admin Bldg
Quantity	1	1	1
Area Serving	Admin, Clerk's Ofc, Legal Dept, Basement	Telephone Room	Police Dept Dispatch Area
Mfg.	Trane	Sanyo	Trane
Model Number	RAUJC40EBA13AB00000 20	CL2472	TTA120E300AA
Serial Number	C10A00417	129173	9381PBUAD
Cooling Source	Electric	Electric	Electric
Cooling Capacity (tons)	40	2	10
Cooling EER	EER 11.7 (IEER 15.4)	EER 9.8 (SEER 17)	11.2 (IEER 11.7)
Heating Source	N/A	N/A	N/A
Heating Capacity input - MBH	N/A	N/A	N/A
Fan HP	-	-	1
Year Manufactured	2010	2007	2009
Age	4	7	5
Estimated Service Life	20	20	20
Remaining Life	16	13	15
Notes	R410A	R410A	R410A
Air Handler Tag#	-	-	AHU-5
Quantity	-	-	1
Area Serving	-	-	Traffic Offices
Location	-	-	Admin Basement
Mfg.	-	-	Trane

N/A Not Applicable

- Not Available

WAYNE TOWNSHIP MUNICIPAL BUILDING

AC UNITS			
Tag#	-	AC1	AC2
Location	Outside of Health Wing	Outside of Health Wing	Outside of Health Wing
Quantity	1	1	1
Area Serving	Radio Room Backup	Room #2 (Meeting Room)	Computer Room
Mfg.	Sanyo	Trane/Odyssey	Carrier
Model Number	SAP186CMH	TTA090A300FA	38ARZ012---501--
Serial Number	2381	7232Y1JAD	4408G40119
Cooling Source	Electric	Electric	Electric
Cooling Capacity (tons)	1.5	7.5	10
Cooling EER	SEER 9.2	10.3	12.4
Heating Source	N/A	N/A	N/A
Heating Capacity input - MBH	N/A	N/A	N/A
Fan HP	-	10	-
Year Manufactured	1981	2007	2008
Age	33	7	6
Estimated Service Life	20	20	20
Remaining Life	0	13	14
Notes	R22	R22	R22
Air Handler Tag#	AH-1	AH-2	AH-3
Quantity	1	1	1
Area Serving	MER Offices Above	MER Offices Above	MER Offices Above
Location	MER Basement	MER Basement	MER Basement
Mfg.	-	-	-
Air Handler Model	FG3AAA06 0000AAAA	-	-
Serial Number	4496V23755	-	-
Cooling Source			

N/A Not Applicable

- Not Available

WAYNE TOWNSHIP MUNICIPAL BUILDING			
AC UNITS			
Tag#	-	-	Health Department
Location	Outside of Health Wing	Outside of Health Wing	Outside of Health Wing
Quantity	1	1	1
Area Serving	Computer Room (Supplemental)	Computer Room (Supplemental)	OEM Dept
Mfg.	Luxaire	EMI	Lennox
Model Number	TCJD60S41S4A	MC4D08080F0FA0F	HS29-030-1P
Serial Number	W1B4417353	1-98-J-6872-39	5897L 13961
Cooling Source	Electric	Electric	Electric
Cooling Capacity (tons)	5	4	2.5
Cooling EER	Estimated 11.25 EER (13.25 SEER)	9 EER	9.5 EER (SEER 10.0)
Heating Source	N/A	N/A	N/A
Heating Capacity input - MBH	N/A	N/A	N/A
Fan HP	1/4	-	-
Year Manufactured	2000	2000-est	1997
Age	14	14	17
Estimated Service Life	20	20	20
Remaining Life	6	6	3
Notes	R410A	R22	HCFC 22
Air Handler Tag#			AH-4
Quantity			1
Area Serving			MER Offices Above
Location			MER Basement
Mfg.			-
Air Handler Model			-
Serial Number			-
Cooling Source			

N/A Not Applicable

- Not Available

[illegible]

N/A Not Applicable
- Not Available

[illegible]

- Not Available

WAYNE TOWNSHIP MUNICIPAL BUILDING			
DOMESTIC WATER HEATERS			
Tag#	Water Heater	Water Heater	
Location	MER Basement	Council Chamber Boiler Room	
Quantity	1	1	
Area Serving	Administration	Bathrooms	
Mfg.	Ruudglas Pacemaker	Rheemglas Standard	
Model	PE52-2	61V52D	
Serial Number	RU 0497B21559	R 0189B28773	
Capacity, Gal	50	50	
Fuel	Electric	Electric	
Type	-	-	
Heating Capacity, MBH	15.35	15.35	
Recovery Rate, GPH	-	-	
Efficiency	-	-	
Year Manufactured	1989	1989	
Age	25	25	
Estimated Service Life	15	15	
Remaining Life	-	-10	
Hot Water Circulator	N/A	N/A	
Notes	-	-	

N/A Not Applicable
 - Not Available

WAYNE WATER & SEWER PUMP STATIONS			
PUMPS			
Tag#	1, 2, 3	-	-
Location	Lower Preakness Sewer Station	West Belt Water Pump Station	West Belt Water Pump Station
Quantity	3	3	2
Area Serving	Sewer	Domestic Water	Domestic Water
Mfg.	-	-	-
Model	-	-	-
Serial Number	M19636/A10A1990267R-1	B456229-010	-
Type	-	Base Mounted	Base Mounted
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	250	250	150
Motor Efcy	-	96%	96%
RPM	1190	1785	1780
Year Manufactured	-	-	-
Age	10 Est	10 Est	10 Est
Estimated Service Life	20	20	20
Remaining Life	10	10	10
Notes	On VFD	Install VFD	Install VFD

N/A Not Applicable
 - Not Available

WAYNE WATER & SEWER PUMP STATIONS			
PUMPS			
Tag#	-	-	-
Location	West Belt Water Pump Station	Jacobus Water Pump Station	Alps Road Water Pump Station
Quantity	2	3	2
Area Serving	Domestic Water	Domestic Water	Domestic Water
Mfg.	-	-	-
Model	-	-	-
Serial Number	-	-	B456225-010
Type	Base Mounted	Base Mounted	Base Mounted
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	75	200	100
Motor Efcy	96%	96%	-
RPM	1785	1780	1785
Year Manufactured	-	-	-
Age	10 Est	15 Est	15 Est
Estimated Service Life	20	20	20
Remaining Life	10	5	5
Notes	On VFD	2 pumps run and 1 for spare, old VFD controls	On VFD controls, 5 years old

N/A Not Applicable
 - Not Available

WAYNE WATER & SEWER PUMP STATIONS			
PUMPS			
Tag#	1, 3	2	
Location	Sheffield Sewer Pump Station	Sheffield Sewer Pump Station	Wanaque Water Pump Station
Quantity	2	1	2
Area Serving	Sewer	Sewer	Sewer
Mfg.	-	-	-
Model	-	-	-
Serial Number	-	-	JA385057
Type	Base Mounted	Base Mounted	Base Mounted
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	200	75	150
Motor Efcy	95%	-	-
RPM	1700	1160	1770
Year Manufactured	-	-	-
Age	2 Est	15 Est	20 Est
Estimated Service Life	20	20	20
Remaining Life	18	5	-
Notes	New Pumps with New VFDs	VFD is 7 years old	New VFDs

N/A Not Applicable
 - Not Available

WAYNE WATER & SEWER PUMP STATIONS			
DOMESTIC WATER HEATERS			
Tag#	Water Heater	Water Heater	
Location	Sheffield Sewer Pump Station	Other Stations	
Quantity	1	4	
Area Serving	Faucets	Faucets	
Mfg.	AO Smith	Various	
Model	-	-	
Serial Number	-	-	
Capacity, Gal	40	-	
Fuel	Natural Gas	Electric	
Type	Tank	Tank	
Heating Capacity, MBH	38 MBH	-	
Recovery Rate, GPH	41.4	-	
Efficiency	80%	-	
Year Manufactured			
Age	~5 yrs old	Various	
Estimated Service Life	12	12	
Remaining Life	7	-	
Hot Water Circulator	None	None	
Notes			

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
AIR HANDLING UNITS			
Tag#	Multi Zone Unit No.1	HV-5	HV-2
Location	Service Building, Mezzaine	Ashbrook Press Area	Service Building, Floatation Room
Quantity	1	1	1
Area Serving	Bay Areas	Ashbrook Press Area	Floatation Room
Mfg.	Trane	-	-
Air Handler Model	LPCA A06F 4F0R A4R0 0001 01CA GE00 000000	-	-
Serial Number	T07C20089	-	-
Cooling Source	Electric	None	None
Condenser Make	-	-	-
Model Number	-	-	-
Serial Number	-	-	-
Cooling Capacity (tons)	-	-	-
Cooling EER	-	-	-
Heating Source	-	-	-
Heating Capacity input - MBH	-	-	-
Fan HP	1	1 (Estimated)	1 (Estimated)
Year Manufactured	1980	1980	1980
Age	34	34	34
Estimated Service Life	20	20	20
Remaining Life	-14	-14	-14
Notes	R22 Refrigerant	Ceiling mounted unit.	Room was very warm
	Constant Volume System	Equipment size estimated.	Ceiling mounted unit.
	Compressors replaced several times.	Thermostatic ON/OFF controls	Equipment size estimated.
		Aprx 3000 hrs operation	Thermostatic ON/OFF controls
			Aprx 3000 hrs operation

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
AIR HANDLING UNITS			
Tag#	HV-1	MAU	
Location	Chlorine Contact Tank	Service Building, Mezzaine	
Quantity	1	1	
Area Serving	Secondary Clarifier Area	-	
Mfg.	-	WING	
Air Handler Model	-	-	
Serial Number	-	18393	
Cooling Source	None	None	
Condenser Make	-	-	
Model Number	-	-	
Serial Number	-	-	
Cooling Capacity (tons)	-	-	
Cooling EER	-	-	
Heating Source	-		
Heating Capacity input - MBH	-	-	
Fan HP	1 (Estimated)	5 HP	
Year Manufactured	1980	1980	
Age	34	34	
Estimated Service Life	20	20	
Remaining Life	-14	-14	
Notes	HW HV unit	Constant Volume System	
	Ceiling mounted unit.		
	Equipment size estimated.		
	Thermostatic ON/OFF controls		
	Aprx 3000 hrs operation		

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
SUPPLEMENTAL UNITS			
Tag#	EF 22		
Location	Service Building, FBI Room & Compressor Room		
Quantity	1		
Area Serving	FBI Room & Compressor Room		
Mfg.	LC Loren Cook Company		
Model	29 CVB		
Serial Number	CVB		
Cooling Source	-		
Cooling Capacity (tons)	-		
Cooling EER	-		
Heating Source	-		
Heating Capacity input - MBH	-		
Fan HP	5 HP		
Year Manufactured	1980		
Age	34		
Estimated Service Life	20		
Remaining Life	-14		
Notes	Constant Volume System		

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
BOILER			
Tag#	UNIT "B"	-	B1 & B2
Location	Service Building, Boiler Room	Service Building, Maintenance Shop	Chlorine Electric Building, Boiler Room
Quantity	1	1	2
Area Serving	Service Building	Maintenance Shop	Chlorine Electric Building
Mfg.	Raypak	Weil-McLain	Fulton
Model	H7-0753	CU-40	ICW 15
Serial Number	1101318658	2421436	PV800JJ
Type of Boiler	-	Electric Water Boiler	Oil Fired Steam Boiler
Fuel	Natural Gas	Electric	No 2 Oil
Output, MBH	652	-	-
Input, MBH	750	137	-
Efficiency	87%	-	-
Year Manufactured	2011	-	2011
Age	3	-	3
Estimated Service Life	20	-	20
Remaining Life	17	-	17
Notes		Being Replaced	

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	-	-	-
Location	Service Building, Next to Ashbrook Press	Service Building, Compressor Room	Service Building, Compressor Room
Quantity	2	1	1
Area Serving	Ashbrook Press	-	-
Mfg.	-	-	-
Model	-	-	-
Serial Number	F189	023076M	3/89
Type	In-line	MOGB	-
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	7.5	20	20
Motor Efcy	84.0%	89%	93% (Nema Eff.)
RPM	3450	1745	1760
Year Manufactured	-	2008	-
Age	-	6	-
Estimated Service Life	-	-	-
Remaining Life	-	-	-
Notes	Both pumps on VFD	Install VFD	Install VFD

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	-	-	Cooling Water Pumps
Location	Service Building, Boiler Room	Service Building, Boiler Room	Service Building, Bay Area
Quantity	2	1	3
Area Serving	Whole Building	Whole Building	-
Mfg.	-	-	-
Model	-	-	-
Serial Number	F1292	924320	-
Type	Centrifugal	Centrifugal	-
Flow, GPM	500	-	-
Head, Ft	40	-	-
Power, HP	7.5	7.5	20
Motor Efcy	86%	-	-
RPM	1725	1755	1755
Year Manufactured	-	-	-
Age	-	-	-
Estimated Service Life	-	20	20
Remaining Life	-	-	-
Notes	Install VFD	Install VFD	8 to 16 hours/day, Only 1 of them runs
			Install VFD

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	2&3	#1, #2, #3, #4	#5
Location	Service Building, Bay Area	Main Thickner Building Roof (1 Pump per Roof, 4 in total)	Main Thickner Building Roof
Quantity	2	4	1
Area Serving	Sewer Water	Main Thickner Rakes	Sludge Holding Tank Rake
Mfg.	-	-	-
Model	-	-	-
Serial Number	CNJ302019	-	125010820
Type	-	-	-
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	100	15	25
Motor Efcy	-	91%	94%
RPM	1200	1755	1765
Year Manufactured	-	-	-
Age	-	-	-
Estimated Service Life	20	20	20
Remaining Life	-	-	-
Notes	Running at 55%	3 out of 4 runs all the time	Already On VFD
	Already On VFD	Install VFDs	

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
RAKES AND FANS			
Tag#	-		
Location	Main Thickner Building Roof		
Quantity	5		
Area Serving	Corresponding Tank for odor control		
Mfg.	-		
Model	-		
Serial Number	-		
Type	-		
Flow, GPM	-		
Head, Ft	-		
Power, HP	2		
Motor Efcy	86%		
RPM	-		
Year Manufactured	-		
Age	20		
Estimated Service Life	25		
Remaining Life	5		
Notes	Odor control FAN. Need to run 24/7 for odor control		

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	Transfer Pump	#7 & 8	-
Location	Odor Control Room (Thickner Pump Station #5)	Main Thickner Building- Lower Level	Main Thickner Building- Lower Level
Quantity	1	2	6
Area Serving	Main Thickner	Main Thickner	Main Thickner
Mfg.	-	Penn Valley Pump	Reeves
Model	-	Double Disk Pump	-
Serial Number	-	-	-
Type	Sludge Transfer Pump	Thickened Sludge, Effluent Pump	Sludge Pumps
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	10	15	7.5
Motor Efcy	90%	92%	-
RPM	3510	1175	-
Year Manufactured	2006	2012	-
Age	8	2	20
Estimated Service Life	25	25	-
Remaining Life	17	23	-
Notes	Only runs during sludge transfer. No need for VFD	2 runs everyday for 15 hours/day	2 of 6 runs everyday, the rest 4 runs 8 to 11 hours/day 5 days/week
		Both on VFD	Only one on VFD
			Install VFD on 5

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	1	-	
Location	Main Thickner Building- Lower Level	Main Thickner Building- Lower Level	
Quantity	1	1	
Area Serving	Thickened Sludge pump	Thickener Sump Pumps	
Mfg.	Toshiba Motor	Carter	
Model	-	#40AW	
Serial Number	S85H5404	-	
Type	-	Diaphragm	
Flow, GPM	-	-	
Head, Ft	-	-	
Power, HP	25	3	
Motor Efcy	91%	89%	
RPM	1175	1760	
Year Manufactured	-	-	
Age	20	20	
Estimated Service Life	25	25	
Remaining Life	5	5	
Notes	Install VFD	Runs based on level	

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	HW Pump	RAS PUMPS	WAS PUMPS
Location	Chlorine Electric Building, Boiler Room	Secondary Roof, Secondary Sublevel	Secondary Roof, Secondary Sublevel
Quantity	2	4	2
Area Serving	Pipe galleries, chlorine building & other	Secondary Clarifier	Secondary Clarifier
Mfg.	-	-	-
Model	-	-	-
Serial Number	-	010706	-
Type	Centrifugal	Base Mounted	Base Mounted
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	7.5	40	5
Motor Efcy	87%	93%	86%
RPM	1765	880	1735
Year Manufactured	-	-	-
Age	10	20	20
Estimated Service Life	-	-	-
Remaining Life	-	-	-
Notes	HW Pump	Return Aeration Sludge Pumps	Waste activated sludge
	Install VFD	All on VFD	All on VFD

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	-	-	
Location	Secondary Roof, Secondary Sublevel	Secondary Roof, Secondary Sublevel	
Quantity	2	2	
Area Serving	Secondary Clarifier	Secondary Clarifier	
Mfg.	-	-	
Model	-	-	
Serial Number	-	40C-AM6-CONT	
Type	Plunger	Base Mounted	
Flow, GPM	-	-	
Head, Ft	-	-	
Power, HP	3	5	
Motor Efcy	90%	86%	
RPM	1760	1725	
Year Manufactured	-	-	
Age	20	20	
Estimated Service Life	-	-	
Remaining Life	-	-	
Notes	Scum pump	De-watering pump	
	Positive Displacement Pump. Runs based on level. No VFD needed.	Runs based on level. No VFD needed	

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	-	-	-
Location	Primary Clarifier Area, Sublevel	Primary Clarifier Area, Sublevel	Primary Clarifier Area, Sublevel
Quantity	4	4	1
Area Serving	Primary Clarifier	Primary Clarifier	Primary Clarifier
Mfg.	-	-	-
Model	-	-	-
Serial Number	4008424	873292320	1415801
Type	Base Mounted	Base Mounted	Base Mounted
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	15	3	3
Motor Efcy	92%	89.5%	-
RPM	875	1715	-
Year Manufactured	-	-	-
Age	20	20	20
Estimated Service Life	-	-	-
Remaining Life	-	-	-
Notes	Primary sludge pumps (Grey)	Scum transfer pumps (Burgundy)	Sampling pump (Blue)
	Install VFD	Runs for transfer only. No VFD needed.	

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	-	-	-
Location	Primary Clarifier Area, Sublevel	Lime Room	Lime Room
Quantity	4	3	2
Area Serving	Clarifier	Lime Room	Lime Room
Mfg.	-	-	-
Model	-	-	-
Serial Number	11006838	F1202293848	71103151928
Type	Base Mounted	Base Mounted	-
Flow, GPM	100/250	-	-
Head, Ft	23/63	-	-
Power, HP	15	1.5	0.75
Motor Efcy	92%	82%	72%
RPM	875	1735	1725
Year Manufactured	-	-	-
Age	20	20	20
Estimated Service Life	-	-	-
Remaining Life	-	-	-
Notes	Grinder.	Intermittent operation	Mixers
	Requires full power when ON. No VFD required.	NO VFD needed.	Requires full power when ON. No VFD required.

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
PUMPS			
Tag#	-	Aerators	Submersible Pump
Location	Lime Room	Aeration Tanks	EQ Basin (2)
Quantity	2	16	4
Area Serving	Lime Room	Aeration Tanks	Aeration Tanks
Mfg.	-	Lighnin	-
Model	-	-	-
Serial Number	-	-	-
Type	-	Base Mounted	-
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	3 (Est)	40	15
Motor Efcy	-	94%	92%
RPM	-	1175	-
Year Manufactured	-	-	-
Age	25 (Est)	20	-
Estimated Service Life	-	-	-
Remaining Life	-	-	-
Notes	Blower	Already on VFDs	Runs based on level. VFD not required
	Intermittent operation		
	NO VFD needed.		

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
DOMESTIC WATER HEATERS			
Tag#	Water Heater		
Location	Service Building, Boiler Room		
Quantity	2		
Area Serving	Whole Building		
Mfg.	A.O. Smith		
Model	DEN 80 110		
Serial Number	1312MOO1792		
Capacity, Gal	80		
Fuel	Electric		
Type	-		
Heating Capacity, MBH	-		
Recovery Rate, GPH	-		
Efficiency	-		
Year Manufactured	2005 (est)		
Age	11		
Estimated Service Life	15		
Remaining Life	4		
Hot Water Circulator	1/4 hp		
Notes	Small hot water usage (lavatory sinks only)		

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
CONDENSING UNITS			
Tag#	-	-	
Location	Service Building Roof	MIP Roof	
Quantity	1	1	
Area Serving	-	-	
Mfg.	Trane	Trane	
Model	2TTA0072A4000AA	-	
Serial Number	8464N2H2F	-	
Capacity, Tons	30 (Est.)	-	
Cooling Source	Electric	-	
Heating Source	N/A	-	
Heating Capacity, MBH	N/A	-	
Cooling EER	SEER 10	-	
Year Manufactured	2008	-	
Age	6	-	
Estimated Service Life	15	-	
Remaining Life	9	-	
Notes	R22		

N/A Not Applicable
 - Not Available

WAYNE WASTEWATER TREATMENT PLANT			
AIR COMPRESSORS			
Tag#	-	-	-
Location	Outside of the main Thickner Building	Chlorine Electric Building, Between Generator Room and Boiler Room	Secondary Roof, Secondary Sublevel
Quantity	1	2	1
Area Serving	Main Thickner	Efluent Chamber	Secondary Clarifier
Mfg.	ECHTOP	Reliance	-
Model	GR3-CI-TF-184-4-B-D-5	74102A1	-
Serial Number	0248876	1282090	BF2
Type	-	Centrifugal	N/A
Flow, GPM	-	-	-
Head, Ft	-	-	-
Power, HP	5	40	15
Motor Efcy	89%	92%	87%
RPM	1745	3535	1750
Year Manufactured	-	-	-
Age	20	20	20
Estimated Service Life	-	-	-
Remaining Life	-	-	-
Notes	Packaged unit.	Periodicly run	Air compressor for the lime system
	Install VFD	Install VFD	Install VFD

N/A Not Applicable
 - Not Available



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM LIST

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Edison, NJ 08837
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Fax: 732.590.0129

ECM #1:

COMPUTER POWER MANAGEMENT

Network Computer Power Management System

Facility	Number of Laptops	Number of Computers with Flat Panel	Number of Computers with CRT	Number of Computers	Electric Savings, kWh	Cost of Electricity \$/kWh	Savings, \$	Cost, \$
Wayne Township Building	17	161		178	25,696	\$0.140	\$3,600	\$5,340
Wayne Public Library		114	2	116	18,665	\$0.144	\$2,695	\$3,480
DPW Garage	5	15	0	20	2,394	\$0.149	\$357	\$600
Total		290	2	314	46,754		\$6,652	\$9,420

	Power (Watt)	Used Hrs ¹	Not used		Energy Savings kWh/Yr
			Hrs Awake ²	Hrs Off ³	
Average Power Laptop	31	840	0	4560	0
Average Power Desktop (Panel)	95	840	3360	4560	319
Average Power Desktop (CRT)	140	840	3360	4560	470
Diversity Factor	50%				

(1): Computers in session (35weeks/yr, 4 days/week, 6 hrs/day)

(2): Computers ON but not used (35weeks/yr, 5 days/week, 24/hr/day except computer hours in session)

(3): Computers shut off Any other time (Weekends, winter/summer breaks)

Cost of software \$30 / Unit

Computer power requirements estimated based on ASHRAE Fundamentals 2013, Section 18, Table 8



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ECM #2 & #3:

LIGHTING EQUIPMENT AND CONTROLS UPGRADE



LIGHTING RETROFIT SUMMARY FOR:
DPW Garage
201 Dey Road, Wayne, NJ 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
DPW Garage	30,600	297	52,581	113,583	1.72	297	26,424	56,339	0.86	26,157	57,244	12,377	69,621	\$8,528	\$1,844	\$10,372	18.9	\$12,880	\$1,390	\$49,764	\$9,860	\$59,624	4.4

22%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
50%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
50%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
25%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL				CUSTOMER: FACILITY: Wayne Township DPW Garage				FACILITY SQ. FT. 30,600				DATE OF AUDIT: 4/2/2014			
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SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
1	2	3	4	5	6	7	2500	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	First	Supervisor	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	4	144	576	2,200	1,267	Retrofit fixture with (4) LED Tubes	4	80	500	Ceiling	1	320	1,700	704	544	64	256	500	563	160	\$108	\$600	\$250	\$655
2	First	1PP	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	4	144	576	2,200	1,267	Retrofit fixture with (4) LED Tubes	4	80	500	Ceiling	1	320	1,700	704	544	64	256	500	563	160	\$108	\$600	\$250	\$655
3	First	Tech Assistant	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	4	144	576	2,200	1,267	Retrofit fixture with (4) LED Tubes	4	80	500	Ceiling	1	320	1,700	704	544	64	256	500	563	160	\$108	\$600	\$250	\$655
4	First	Front Entrance	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	2	144	288	5,000	1,440	Retrofit fixture with (4) LED Tubes	2	80	0			160	5,000	800	800	64	128	0	640	0	\$95	\$300	\$0	\$220
5	First	Front Entrance	2"x2" Recessed Troffer, Prismatic Lens, w/ (2) F20T12/34w Lamps & (1) Magnetic Ballast	1	42	42	5,000	208	Retrofit fixture with (2) LED Tubes	1	30	0			30	5,000	150	150	12	12	0	58	0	\$9	\$60	\$0	\$40
6	First	Ports Office	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	3	144	432	2,200	950	Retrofit fixture with (4) LED Tubes	3	80	500	Ceiling	1	240	1,700	528	408	64	192	500	422	120	\$81	\$450	\$250	\$545
7	First	Meeting Room	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	4	144	576	2,200	1,267	Retrofit fixture with (4) LED Tubes	4	80	500	Ceiling	1	320	1,700	704	544	64	256	500	563	160	\$108	\$600	\$250	\$655
8	First	Sewer Dept.	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	4	144	576	2,200	1,267	Retrofit fixture with (4) LED Tubes	4	80	500	Ceiling	1	320	1,700	704	544	64	256	500	563	160	\$108	\$600	\$250	\$655
9	First	Conference Room	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	6	144	864	2,200	1,901	Retrofit fixture with (4) LED Tubes	6	80	500	Ceiling	1	480	1,700	1,056	816	64	384	500	845	240	\$162	\$900	\$250	\$875
10	First	Garage Entrance	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	2	144	288	5,000	1,440	Retrofit fixture with (4) LED Tubes	2	80	0			160	5,000	800	800	64	128	0	640	0	\$95	\$300	\$0	\$220
11	First	Boiler Room	Screw-in Compact Fluorescent Lamp (23W)	4	23	92	2,200	202	None	4	23	500	Ceiling	1	92	1,700	202	156	0	0	500	0	46	\$7	\$0	\$250	\$215
12	First	Women's Room	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	2,200	317	Retrofit fixture with (4) LED Tubes	1	80	0			80	2,200	176	176	64	64	0	141	0	\$21	\$150	\$0	\$110
13	First	Main Hallway	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	9	144	1,296	5,000	6,480	Retrofit fixture with (4) LED Tubes	9	80	500	Ceiling	1	720	4,500	3,600	3,240	64	576	500	2,880	360	\$483	\$1,350	\$250	\$1,205
14	First	Back Hallway	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	3	144	432	5,000	2,160	Retrofit fixture with (4) LED Tubes	3	80	500	Ceiling	1	240	4,500	1,200	1,080	64	192	500	960	120	\$161	\$450	\$250	\$545
15	First	Operations Office	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	4	144	576	2,200	1,267	Retrofit fixture with (4) LED Tubes	4	80	500	Ceiling	1	320	1,700	704	544	64	256	500	563	160	\$108	\$600	\$250	\$655
16	First	Pump Station Foreman	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	4	144	576	2,200	1,267	Retrofit fixture with (4) LED Tubes	4	80	500	Ceiling	1	320	1,700	704	544	64	256	500	563	160	\$108	\$600	\$250	\$655
17	First	Meter Foreman	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	4	144	576	2,200	1,267	Retrofit fixture with (4) LED Tubes	4	80	500	Ceiling	1	320	1,700	704	544	64	256	500	563	160	\$108	\$600	\$250	\$655
18	First	Test Room	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	6	144	864	2,200	1,901	Retrofit fixture with (4) LED Tubes	6	80	500	Ceiling	1	480	1,700	1,056	816	64	384	500	845	240	\$162	\$900	\$250	\$875
19	Second	Lunch Room	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	6	144	864	2,200	1,901	Retrofit fixture with (4) LED Tubes	6	80	500	Ceiling	1	480	1,700	1,056	816	64	384	500	845	240	\$162	\$900	\$250	\$875
20	Second	Lunch Room	2"x2" Recessed Troffer, Prismatic Lens, w/ (2) F20T12/34w Lamps & (1) Magnetic Ballast	1	42	42	2,200	92	Retrofit fixture with (2) LED Tubes	1	30	0			30	2,200	66	66	12	12	0	26	0	\$4	\$60	\$0	\$40
21	Second	Water Foreman	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	2	144	288	2,200	634	Retrofit fixture with (4) LED Tubes	2	80	0			160	2,200	352	352	64	128	0	282	0	\$42	\$300	\$0	\$220
22	First	Water Dept. Garage	400W Metal Halide Fixtures (Pendant)	12	460	5,520	2,200	12,144	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	12	236	500	Ceiling	1	2,832	1,700	6,230	4,814	224	2,688	500	5,914	1,416	\$1,092	\$4,800	\$250	\$3,815
23	First	Water Dept. Garage	6" Surface Mount, Prismatic Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	2	142	283	2,200	623	Retrofit fixture with (2) LED Tubes	2	40	0			80	2,200	176	176	102	203	0	447	0	\$67	\$180	\$0	\$140
24	First	Locker Room	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	8	144	1,152	2,200	2,534	Retrofit fixture with (4) LED Tubes	8	80	500	Ceiling	1	640	1,700	1,408	1,088	64	512	500	1,126	320	\$215	\$1,200	\$250	\$1,095
25	First	Parts Storage - Gloves	60W Incandescent	6	60	360	500	180	11W LED Lamp	6	11	500	Ceiling	1	66	0	33	0	49	294	500	147	33	\$27	\$72	\$250	\$287
26	First	Parts Storage - Water	8" Surface Mount, Prismatic Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	1	142	142	500	71	Retrofit fixture with (2) LED Tubes	1	40	0			40	500	20	20	102	102	0	51	0	\$8	\$90	\$0	\$70
27	First	Parts Storage - Water	8" Surface Mount, Prismatic Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	3	142	425	500	212	Retrofit fixture with (2) LED Tubes	3	40	500	Ceiling	1	120	0	60	0	102	305	500	152	60	\$32	\$270	\$250	\$425
28	Second	Upstairs Storage	8" Surface Mount, Prismatic Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	5	142	708	500	354	Retrofit fixture with (2) LED Tubes	5	40	500	Ceiling	1	200	0	100	0	102	508	500	254	100	\$53	\$450	\$250	\$565
29	First	Server Room	8" Surface Mount, Prismatic Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	1	142	142	500	71	Retrofit fixture with (2) LED Tubes	1	40	0			40	500	20	20	102	102	0	51	0	\$8	\$90	\$0	\$70
30	First	Back Entrance	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	1	75	75	5,000	375	Retrofit fixture with (2) LED Tubes	1	40	0			40	5,000	200	200	35	35	0	175	0	\$26	\$90	\$0	\$70
31	First	Storage	2"x4" Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	500	72	Retrofit fixture with (4) LED Tubes	1	80	0			80	500	40	40	64	64	0	32	0	\$5	\$150	\$0	\$110
32	First	Lunch Room	2"x4" Recessed Fixture, Prismatic Lens, w/ (3) F40T12/34w Lamps & (1) Magnetic Ballast	8	117	936	2,200	2,059	Retrofit fixture with (3) LED Tubes	8	60	500	Ceiling	1	480	1,700	1,056	816	57	456	500	1,003	240	\$185	\$960	\$250	\$935
33	First	Locker Room	2"x2" Recessed Troffer, Prismatic Lens, w/ (2) F20T12/34w Lamps & (1) Magnetic Ballast	6	42	250	2,200	549	Retrofit fixture with (2) LED Tubes	6	30	500	Ceiling	1	180	1,700	396	306	12	70	500	153	90	\$36	\$360	\$250	\$455
34	First	Closet	2"x2" Recessed Troffer, Prismatic Lens, w/ (2) F20T12/34w Lamps & (1) Magnetic Ballast	1	42	42	500	21	Retrofit fixture with (2) LED Tubes	1	30	0			30	500	15	15	12	12	0	6	0	\$1	\$60	\$0	\$40



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: FACILITY:		Wayne Township DPW Garage		FACILITY SQ. FT. 30,600		DATE OF AUDIT: 4/2/2014	
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SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							2500					500				2000								\$0.149			
35	First	Bathroom	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	2	144	288	2,200	634	Retrofit fixture with (4) LED Tubes	2	80	0			160	2,200	352	352	64	128	0	282	0	\$42	\$300	\$0	\$220
36	First	Hallway	2'x2' Recessed Troffer, Clear Lens, w/ (2) F40T12/34w U-Lamps & (1) Magnetic Ballast	4	78	312	5,000	1,560	Retrofit fixture with (2) LED Tubes	4	40	500	Ceiling	1	160	4,500	800	720	38	152	500	760	80	\$125	\$360	\$250	\$495
37	First	Equipment Office	2'x2' Recessed Troffer, No Lens, w/ (3) FBO31T8, 31w 800 series U-Lamps & (1) Electronic Ballast	6	86	517	2,200	1,138	Retrofit fixture with (3) LED U-Tubes	6	60	500	Ceiling	1	360	1,700	792	612	26	157	500	346	180	\$78	\$595	\$250	\$630
38	First	Storage	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	7	75	525	500	263	Retrofit fixture with (2) LED Tubes	7	40	500	Ceiling	1	280	0	140	0	35	245	500	123	140	\$39	\$630	\$250	\$705
39	First	Office	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) F20T12/34w Lamps & (1) Magnetic Ballast	8	42	333	2,200	732	Retrofit fixture with (2) LED Tubes	8	30	500	Ceiling	1	240	1,700	528	408	12	93	500	204	120	\$48	\$480	\$250	\$535
40	First	Road Foreman	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	6	62	372	2,200	818	Retrofit fixture with (2) LED U-Tubes	6	52	500	Ceiling	1	312	1,700	686	530	10	60	500	132	156	\$43	\$540	\$250	\$635
41	First	Tool Room	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	8	75	600	2,200	1,320	Retrofit fixture with (2) LED Tubes	8	40	500	Ceiling	1	320	1,700	704	544	35	280	500	616	160	\$116	\$720	\$250	\$775
42	First	Main Garage - Road Dept.	400W Metal Halide Fixtures (Pendant)	28	460	12,880	2,200	28,336	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	28	236	500	Ceiling	1	6,608	1,700	14,538	11,234	224	6,272	500	13,798	3,304	\$2,548	\$11,200	\$250	\$8,615
43	First	Main Garage - Road Dept.	8' Surface Mount, Prismatic Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	1	142	142	2,200	311	Retrofit fixture with (2) LED Tubes	1	40	0			40	2,200	88	88	102	102	0	223	0	\$33	\$90	\$0	\$70
44	Second	Upstairs Storage	4' Pendant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	40	75	3,000	500	1,500	Retrofit fixture with (2) LED Tubes	40	40	500	Ceiling	2	1,600	0	800	0	35	1,400	500	700	800	\$223	\$3,600	\$500	\$3,230
45	First	Storage	4' Pendant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	3	75	225	500	113	Retrofit fixture with (2) LED Tubes	3	40	500	Ceiling	1	120	0	60	0	35	105	500	53	60	\$17	\$270	\$250	\$425
46	First	Traffic/Recycling Garage	400W Metal Halide Fixtures (Pendant)	12	460	5,520	2,200	12,144	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	12	236	500	Ceiling	1	2,832	1,700	6,230	4,814	224	2,688	500	5,914	1,416	\$1,092	\$4,800	\$250	\$3,815
47	First	Traffic Foreman	2'x4' Recessed Fixture, Prismatic Lens, w/ (3) F40T12/34w Lamps & (1) Magnetic Ballast	2	117	234	2,200	515	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,200	264	264	57	114	0	251	0	\$37	\$240	\$0	\$180
48	First	Traffic Foreman	2'x2' Recessed Troffer, No Lens, w/ (3) FBO31T8, 31w 800 series U-Lamps & (1) Electronic Ballast	2	86	172	2,200	379	Retrofit fixture with (3) LED U-Tubes	2	60	0			120	2,200	264	264	26	52	0	115	0	\$17	\$198	\$0	\$138
49	First	Task Lighting	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	1	75	75	2,200	165	Retrofit fixture with (2) LED Tubes	1	40	0			40	2,200	88	88	35	35	0	77	0	\$11	\$90	\$0	\$70
50	First	Storage	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	3	75	225	500	113	Retrofit fixture with (2) LED Tubes	3	40	500	Ceiling	1	120	0	60	0	35	105	500	53	60	\$17	\$270	\$250	\$425
51	Second	Upstairs Storage	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	3	75	225	500	113	Retrofit fixture with (2) LED Tubes	3	40	500	Ceiling	1	120	0	60	0	35	105	500	53	60	\$17	\$270	\$250	\$425
52	First	Office	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	4	62	248	2,200	546	Retrofit fixture with (2) LED U-Tubes	4	52	500	Ceiling	1	208	1,700	458	354	10	40	500	88	104	\$29	\$360	\$250	\$495
53	First	Storage	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) F20T12/34w Lamps & (1) Magnetic Ballast	2	42	83	500	42	Retrofit fixture with (2) LED Tubes	2	30	0			60	500	30	30	12	23	0	12	0	\$2	\$120	\$0	\$80
54	First	Storage	2'x2' Recessed Troffer, No Lens, w/ (3) FBO31T8, 31w 800 series U-Lamps & (1) Electronic Ballast	2	86	172	500	86	Retrofit fixture with (3) LED U-Tubes	2	60	0			120	500	60	60	26	52	0	26	0	\$4	\$198	\$0	\$138
55	First	Parks Dept. Storage	400W Metal Halide Fixtures (Pendant)	4	460	1,840	500	920	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	4	236	500	Ceiling	1	944	0	472	0	224	896	500	448	472	\$137	\$1,600	\$250	\$1,415
56	Second	Upstairs Storage	8' Surface Mount, Prismatic Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	2	142	283	500	142	Retrofit fixture with (2) LED Tubes	2	40	0			80	500	40	40	102	203	0	102	0	\$15	\$180	\$0	\$140
57	First	Road Dept. Main Electric Room	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	4	75	300	2,200	660	Retrofit fixture with (2) LED Tubes	4	40	500	Ceiling	1	160	1,700	352	272	35	140	500	308	80	\$58	\$360	\$250	\$495
58	Exterior	West	Wall Mounted-400W HPS	2	465	930	3,650	3,395	100 Watt LED Wall Mount	2	100	500	Wall	1	200	3,150	730	630	365	730	500	2,665	100	\$412	\$1,000	\$120	\$900
59	Exterior	South	Wall Mounted-250W HPS	4	295	1,180	3,650	4,307	45 Watt LED Wall Mount	4	45	500	Wall	1	180	3,150	657	567	250	1,000	500	3,650	90	\$557	\$800	\$120	\$500
60	Exterior	North	Wall Mounted-250W HPS	4	295	1,180	3,650	4,307	45 Watt LED Wall Mount	4	45	500	Wall	1	180	3,150	657	567	250	1,000	500	3,650	90	\$557	\$800	\$120	\$500
				297		52,581		113,583		297				41	26,424		56,339	43,962				57,244	12,377	\$10,372	\$49,764	\$9,860	\$45,354



LIGHTING RETROFIT SUMMARY FOR:
Mountain View WPCF (Wet&Dry Phase)
205 Dey Road, Wayne, NJ 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Mountain View WPCF (Wet&Dry Phase)	83,980	941	60,387	300,625	0.72	941	41,975	210,665	0.50	18,412	89,960	9,493	99,453	\$11,287	\$1,191	\$12,478	29.7	\$16,780	\$2,100	\$74,304	\$15,000	\$89,304	5.6

19%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
70%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
7%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
5%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT
LINE x LINE DETAIL

CUSTOMER: Wayne Township
FACILITY: Mountain View WPCF (Wet&Dry Phase)

FACILITY SQ. FT.
83,980

DATE OF AUDIT:
4/25/2013

SPACE DESCRIPTION										REPLACEMENT FIXTURES								
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR
							8760					500						
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20
1	Service Building	4th Floor Men's Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	1	62	62	6,000	372	Retrofit fixture with (2) LED U-Tubes	1	52	0			52	6,000	312	312
2	Service Building	4th Floor Ladies Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	1	62	62	6,000	372	Retrofit fixture with (2) LED U-Tubes	1	52	0			52	6,000	312	312
3	Service Building	Stairwell A	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Prismatic Lens	8	62	496	8,760	4,345	Retrofit fixture with (2) LED Tubes	8	40	0			320	8,760	2,803	2,803
4	Service Building	Stairwell B	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Prismatic Lens	8	62	496	8,760	4,345	Retrofit fixture with (2) LED Tubes	8	40	0			320	8,760	2,803	2,803
5	Service Building	Stairwell C	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Prismatic Lens	8	62	496	8,760	4,345	Retrofit fixture with (2) LED Tubes	8	40	0			320	8,760	2,803	2,803
6	Service Building	Stairwell D	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Prismatic Lens	8	62	496	8,760	4,345	Retrofit fixture with (2) LED Tubes	8	40	0			320	8,760	2,803	2,803
7	Service Building	Mezzanine Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	500	186	Retrofit fixture with (2) LED Tubes	6	40	0			240	500	120	120
8	Service Building	4th Floor Corridor	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	2	62	124	8,760	1,086	Retrofit fixture with (2) LED U-Tubes	2	52	0			104	8,760	911	911
9	Service Building	4th Floor Corridor	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,507	Retrofit fixture with (3) LED Tubes	2	60	0			120	8,760	1,051	1,051
10	Service Building	Reception Area	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	2	62	124	8,760	1,086	Retrofit fixture with (2) LED U-Tubes	2	52	0			104	8,760	911	911
11	Service Building	Reception Area	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,507	Retrofit fixture with (3) LED Tubes	2	60	0			120	8,760	1,051	1,051
12	Service Building	Superintendent	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	3,000	1,548	Retrofit fixture with (3) LED Tubes	6	60	500	Ceiling	1	360	2,500	1,080	900
13	Service Building	Meeting Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	6	62	372	2,200	818	Retrofit fixture with (2) LED U-Tubes	6	52	500	Ceiling	1	312	1,700	686	530
14	Service Building	SCADA Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,507	Retrofit fixture with (3) LED Tubes	2	60	0			120	8,760	1,051	1,051
15	Service Building	Mark's Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,200	757	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	1,700	528	408
16	Service Building	Corridor	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	4	62	248	8,760	2,172	Retrofit fixture with (2) LED U-Tubes	4	52	500	Ceiling	1	208	8,260	1,822	1,718
17	Service Building	MIP Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	86	860	8,760	7,534	Retrofit fixture with (3) LED Tubes	10	60	500	Ceiling	1	600	8,260	5,256	4,956
18	Service Building	MIP Room	1'x4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast	7	62	434	8,760	3,802	Retrofit fixture with (2) LED Tubes	7	40	500	Ceiling	1	280	8,260	2,453	2,313
19	Service Building	Belt Press Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	34	62	2,108	8,760	18,466	Retrofit fixture with (2) LED Tubes	34	40	500	Ceiling	2	1,360	8,260	11,914	11,234
20	Service Building	Belt Press Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	30	62	1,860	8,760	16,294	Retrofit fixture with (2) LED Tubes	30	40	500	Ceiling	1	1,200	8,260	10,512	9,912
21	Service Building	Bathroom	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	1	62	62	4,000	248	Retrofit fixture with (2) LED Tubes	1	40	0			40	4,000	160	160
22	Service Building	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,200	378	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,200	264	264
23	Service Building	Roof Access	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	2	62	124	500	62	Retrofit fixture with (2) LED Tubes	2	40	0			80	500	40	40
24	Service Building	Ash Conveyer Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	7	62	434	500	217	Retrofit fixture with (2) LED Tubes	7	40	500	Ceiling	1	280	0	140	0
25	Service Building	Room Behind MIP	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	5	62	310	500	155	Retrofit fixture with (2) LED Tubes	5	40	500	Ceiling	1	200	0	100	0
26	Service Building	Belt Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	4	62	248	8,760	2,172	Retrofit fixture with (2) LED Tubes	4	40	500	Ceiling	1	160	8,260	1,402	1,322
27	Service Building	3rd Floor Incinerator	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	12	62	744	8,760	6,517	Retrofit fixture with (2) LED Tubes	12	40	500	Ceiling	1	480	8,260	4,205	3,965
28	Service Building	2nd Floor Incinerator	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	10	62	620	8,760	5,431	Retrofit fixture with (2) LED Tubes	10	40	500	Ceiling	1	400	8,260	3,504	3,304
29	Service Building	2nd Floor Incinerator	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	12	62	744	8,760	6,517	Retrofit fixture with (2) LED Tubes	12	40	500	Ceiling	1	480	8,260	4,205	3,965
30	Service Building	Ash Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	500	186	Retrofit fixture with (2) LED Tubes	6	40	500	Ceiling	1	240	0	120	0
31	Service Building	Room Next to Ash Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	500	186	Retrofit fixture with (2) LED Tubes	6	40	500	Ceiling	1	240	0	120	0
32	Service Building	Room Opposite to Incinerator	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	5	62	310	500	155	Retrofit fixture with (2) LED Tubes	5	40	500	Ceiling	1	200	0	100	0
33	Service Building	2nf Floor FBI Hallway	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	6	62	372	8,760	3,259	Retrofit fixture with (2) LED U-Tubes	6	52	500	Ceiling	1	312	8,260	2,733	2,577
34	Service Building	Generator Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	8	62	496	500	248	Retrofit fixture with (2) LED Tubes	8	40	500	Ceiling	1	320	0	160	0

ENERGY ANALYSIS					
WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)
					\$0.125
21	22	23	24	25	26
10	10	0	60	0	\$8
10	10	0	60	0	\$8
22	176	0	1,542	0	\$193
22	176	0	1,542	0	\$193
22	176	0	1,542	0	\$193
22	176	0	1,542	0	\$193
22	132	0	66	0	\$8
10	20	0	175	0	\$22
26	52	0	456	0	\$57
10	20	0	175	0	\$22
26	52	0	456	0	\$57
26	156	500	468	180	\$81
10	60	500	132	156	\$36
26	52	0	456	0	\$57
26	104	500	229	120	\$44
10	40	500	350	104	\$57
26	260	500	2,278	300	\$323
22	154	500	1,349	140	\$187
22	748	500	6,552	680	\$907
22	660	500	5,782	600	\$801
22	22	0	88	0	\$11
26	52	0	114	0	\$14
22	44	0	22	0	\$3
22	154	500	77	140	\$27
22	110	500	55	100	\$19
22	88	500	771	80	\$107
22	264	500	2,313	240	\$320
22	220	500	1,927	200	\$267
22	264	500	2,313	240	\$320
22	132	500	66	120	\$23
22	132	500	66	120	\$23
22	110	500	55	100	\$19
10	60	500	526	156	\$86
22	176	500	88	160	\$31

COST ANALYSIS		
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
27	28	29
\$90	\$0	\$70
\$90	\$0	\$70
\$720	\$0	\$560
\$720	\$0	\$560
\$720	\$0	\$560
\$720	\$0	\$560
\$540	\$0	\$420
\$180	\$0	\$140
\$240	\$0	\$180
\$180	\$0	\$140
\$240	\$0	\$180
\$720	\$250	\$755
\$540	\$250	\$635
\$240	\$0	\$180
\$480	\$250	\$575
\$360	\$250	\$495
\$1,200	\$250	\$1,115
\$630	\$250	\$705
\$3,060	\$500	\$2,810
\$2,700	\$250	\$2,315
\$90	\$0	\$70
\$240	\$0	\$180
\$180	\$0	\$140
\$630	\$250	\$705
\$450	\$250	\$565
\$360	\$250	\$495
\$1,080	\$250	\$1,055
\$900	\$250	\$915
\$1,080	\$250	\$1,055
\$540	\$250	\$635
\$540	\$250	\$635
\$450	\$250	\$565
\$540	\$250	\$635
\$720	\$250	\$775



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER:	Wayne Township	FACILITY SQ. FT.	DATE OF AUDIT:
	FACILITY:	Mountain View WPCF (Wet&Dry Phase)	83,980	4/25/2013

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							8760					500				\$0.125											
35	Service Building	FBI Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	500	186	Retrofit fixture with (2) LED Tubes	6	40	500	Ceiling	1	240	0	120	0	22	132	500	66	120	\$23	\$540	\$250	\$635
36	Service Building	Flotation Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	15	62	930	500	465	Retrofit fixture with (2) LED Tubes	15	40	500	Ceiling	1	600	0	300	0	22	330	500	165	300	\$58	\$1,350	\$250	\$1,265
37	Service Building	Compressor Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	500	186	Retrofit fixture with (2) LED Tubes	6	40	500	Ceiling	1	240	0	120	0	22	132	500	66	120	\$23	\$540	\$250	\$635
38	Service Building	Lunch Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	7	62	434	2,200	955	Retrofit fixture with (2) LED U-Tubes	7	52	500	Ceiling	1	364	1,700	801	619	10	70	500	154	182	\$42	\$630	\$250	\$705
39	Service Building	Time Clock Area	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	3	62	186	8,760	1,629	Retrofit fixture with (2) LED U-Tubes	3	52	500	Ceiling	1	156	8,260	1,367	1,289	10	30	500	263	78	\$43	\$270	\$250	\$425
40	Service Building	Locker Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	5	62	310	8,760	2,716	Retrofit fixture with (2) LED U-Tubes	5	52	500	Ceiling	1	260	8,260	2,278	2,148	10	50	500	438	130	\$71	\$450	\$250	\$565
41	Service Building	Locker Room	60W Incandescent	2	60	120	8,760	1,051	11W LED Lamp	2	11	0			22	8,760	193	193	49	98	0	858	0	\$108	\$24	\$0	\$24
42	Service Building	2nd Floor Elevator Lobby	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	4	62	248	8,760	2,172	Retrofit fixture with (2) LED U-Tubes	4	52	500	Ceiling	1	208	8,260	1,822	1,718	10	40	500	350	104	\$57	\$360	\$250	\$495
43	Service Building	1st Floor Lobby	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	6	62	372	8,760	3,259	Retrofit fixture with (2) LED U-Tubes	6	52	500	Ceiling	1	312	8,260	2,733	2,577	10	60	500	526	156	\$86	\$540	\$250	\$635
44	Service Building	Ejector Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	8,760	3,259	Retrofit fixture with (2) LED Tubes	6	40	500	Ceiling	1	240	8,260	2,102	1,982	22	132	500	1,156	120	\$160	\$540	\$250	\$635
45	Service Building	MCC Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	12	62	744	8,760	6,517	Retrofit fixture with (2) LED Tubes	12	40	500	Ceiling	1	480	8,260	4,205	3,965	22	264	500	2,313	240	\$320	\$1,080	\$250	\$1,055
46	Service Building	Boiler Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	9	62	558	500	279	Retrofit fixture with (2) LED Tubes	9	40	500	Ceiling	1	360	0	180	0	22	198	500	99	180	\$35	\$810	\$250	\$845
47	Service Building	Hallway Next to Boiler Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	3	62	186	8,760	1,629	Retrofit fixture with (2) LED U-Tubes	3	52	500	Ceiling	1	156	8,260	1,367	1,289	10	30	500	263	78	\$43	\$270	\$250	\$425
48	Service Building	Lab	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	62	868	3,000	2,604	Retrofit fixture with (2) LED Tubes	14	40	500	Ceiling	1	560	2,500	1,680	1,400	22	308	500	924	280	\$151	\$1,260	\$250	\$1,195
49	Service Building	Office in Lab	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	3,000	372	Retrofit fixture with (2) LED Tubes	2	40	0			80	3,000	240	240	22	44	0	132	0	\$17	\$180	\$0	\$140
50	Service Building	Oil Drum Storage	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	5	62	310	500	155	Retrofit fixture with (2) LED Tubes	5	40	500	Ceiling	1	200	0	100	0	22	110	500	55	100	\$19	\$450	\$250	\$565
51	Service Building	Ash Truck Bay	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	2,200	818	Retrofit fixture with (2) LED Tubes	6	40	500	Ceiling	1	240	1,700	528	408	22	132	500	290	120	\$51	\$540	\$250	\$635
52	Service Building	Bay Area	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	17	62	1,054	2,200	2,319	Retrofit fixture with (2) LED Tubes	17	40	500	Ceiling	1	680	1,700	1,496	1,156	22	374	500	823	340	\$146	\$1,530	\$250	\$1,405
53	Service Building	Bay Area	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Prismatic Lens	2	62	124	8,760	1,086	Retrofit fixture with (2) LED Tubes	2	40	0			80	8,760	701	701	22	44	0	385	0	\$48	\$180	\$0	\$140
54	Service Building	1st Floor Incinerator	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	12	62	744	500	372	Retrofit fixture with (2) LED Tubes	12	40	500	Ceiling	1	480	0	240	0	22	264	500	132	240	\$47	\$1,080	\$250	\$1,055
55	Service Building	Shop Next to Jack's Shop	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	2,200	818	Retrofit fixture with (2) LED Tubes	6	40	500	Ceiling	1	240	1,700	528	408	22	132	500	290	120	\$51	\$540	\$250	\$635
56	Service Building	Jack's Shop	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	21	62	1,302	2,200	2,864	Retrofit fixture with (2) LED Tubes	21	40	500	Ceiling	1	840	1,700	1,848	1,428	22	462	500	1,016	420	\$180	\$1,890	\$250	\$1,685
57	Service Building	Jack's Shop - Cage	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	500	186	Retrofit fixture with (2) LED Tubes	6	40	500	Ceiling	1	240	0	120	0	22	132	500	66	120	\$23	\$540	\$250	\$635
58	Thickener Bldg.	Inside Thickener Tank-1	150 W Metal Halide Wall Pack in Shoebox	3	185	555	500	278	45 Watt LED Wall Mount	3	45	500	Ceiling	1	135	0	68	0	140	420	500	210	68	\$35	\$1,200	\$250	\$1,115
59	Thickener Bldg.	Inside Thickener Tank-2	150 W Metal Halide Wall Pack in Shoebox	3	185	555	500	278	45 Watt LED Wall Mount	3	45	500	Ceiling	1	135	0	68	0	140	420	500	210	68	\$35	\$1,200	\$250	\$1,115
60	Thickener Bldg.	Inside Thickener Tank-3	150 W Metal Halide Wall Pack in Shoebox	3	185	555	500	278	45 Watt LED Wall Mount	3	45	500	Ceiling	1	135	0	68	0	140	420	500	210	68	\$35	\$1,200	\$250	\$1,115
61	Thickener Bldg.	Inside Thickener Tank-4	150 W Metal Halide Wall Pack in Shoebox	3	185	555	500	278	45 Watt LED Wall Mount	3	45	500	Ceiling	1	135	0	68	0	140	420	500	210	68	\$35	\$1,200	\$250	\$1,115
62	Thickener Bldg.	Inside Thickener Tank-5	150 W Metal Halide Wall Pack in Shoebox	3	185	555	500	278	45 Watt LED Wall Mount	3	45	500	Ceiling	1	135	0	68	0	140	420	500	210	68	\$35	\$1,200	\$250	\$1,115
63	Thickener Bldg.	Thickener Tank-5 Inside	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Clear Lens	2	62	124	500	62	Retrofit fixture with (2) LED Tubes	2	40	0			80	500	40	40	22	44	0	22	0	\$3	\$180	\$0	\$140
64	Thickener Bldg.	Thickener Tank-5 Inside	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Clear Lens	5	62	310	500	155	Retrofit fixture with (2) LED Tubes	5	40	500	Ceiling	1	200	0	100	0	22	110	500	55	100	\$19	\$450	\$250	\$565
65	Thickener Bldg.	Thickener Tank-5 Inside, Control Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Clear Lens	4	62	248	500	124	Retrofit fixture with (2) LED Tubes	4	40	500	Ceiling	1	160	0	80	0	22	88	500	44	80	\$16	\$360	\$250	\$495
66	Thickener Bldg.	Tanks 1-4 Main Level	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Clear Lens	9	62	558	8,760	4,888	Retrofit fixture with (2) LED Tubes	9	40	500	Ceiling	1	360	8,260	3,154	2,974	22	198	500	1,734	180	\$240	\$810	\$250	\$845
67	Thickener Bldg.	Tanks 1-4 Downstairs	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Clear Lens	9	62	558	8,760	4,888	Retrofit fixture with (2) LED Tubes	9	40	500	Ceiling	1	360	8,260	3,154	2,974	22	198	500	1,734	180	\$240	\$810	\$250	\$845
68	Truck Driver Cabin	Plunge/Truck Shop	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Clear Lens	2	62	124	8,760	1,086	Retrofit fixture with (2) LED Tubes	2	40	0			80	8,760	701	701	22	44	0	385	0	\$48	\$180	\$0	\$140



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER:	Wayne Township	FACILITY SQ. FT.	DATE OF AUDIT:
	FACILITY:	Mountain View WPCF (Wet&Dry Phase)	83,980	4/25/2013

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							8760					500				\$0.125											
69	Maintenance Shop	Maintenance Storage	Recessed round fixture, No lens w/ (1) 32W Compact Fluorescent Lamp (CFL)	6	32	192	3,000	576	None	6	32	500	Ceiling	1	192	2,500	576	480	0	0	500	0	96	\$12	\$0	\$250	\$215
70	Maintenance Shop	Maintenance Storage	Recessed round fixture, No lens w/ (1) 32W Compact Fluorescent Lamp (CFL)	4	32	128	500	64	None	4	32	500	Ceiling	1	128	0	64	0	0	0	500	0	64	\$8	\$0	\$250	\$215
71	Maintenance Shop	Maintenance Shop	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	18	62	1,116	8,760	9,776	Retrofit fixture with (2) LED Tubes	18	40	500	Ceiling	2	720	8,260	6,307	5,947	22	396	500	3,469	360	\$480	\$1,620	\$500	\$1,690
72	Maintenance Shop	Maintenance Shop	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	3	62	186	8,760	1,629	Retrofit fixture with (2) LED Tubes	3	40	500	Ceiling	1	120	8,260	1,051	991	22	66	500	578	60	\$80	\$270	\$250	\$425
73	Maintenance Shop	Office 1	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	3,000	1,032	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,500	720	600	26	104	500	312	120	\$54	\$480	\$250	\$575
74	Maintenance Shop	Office 2	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	3,000	1,032	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,500	720	600	26	104	500	312	120	\$54	\$480	\$250	\$575
75	Maintenance Shop	Cage-1	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	10	62	620	2,200	1,364	Retrofit fixture with (2) LED Tubes	10	40	500	Ceiling	1	400	1,700	880	680	22	220	500	484	200	\$86	\$900	\$250	\$915
76	Maintenance Shop	Cage-2	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Clear Lens	4	62	248	2,200	546	Retrofit fixture with (2) LED Tubes	4	40	500	Ceiling	1	160	1,700	352	272	22	88	500	194	80	\$34	\$360	\$250	\$495
77	Maintenance Shop	Cage-2	23W LED Pendant Fixture, Prismatic Lens	1	23	23	2,200	51	None	1	23	500	Ceiling	1	23	1,700	51	39	0	0	500	0	12	\$1	\$0	\$250	\$215
78	Maintenance Shop	Restroom	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	1	62	62	2,200	136	Retrofit fixture with (2) LED Tubes	1	40	500	Ceiling	1	40	1,700	88	68	22	22	500	48	20	\$9	\$90	\$250	\$285
79	Wet Phase	Sodium HydroChloride Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	1	62	62	2,200	136	Retrofit fixture with (2) LED Tubes	1	40	0			40	2,200	88	88	22	22	0	48	0	\$6	\$90	\$0	\$70
80	Wet Phase	Mini Lab	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	1	62	62	2,200	136	Retrofit fixture with (2) LED Tubes	1	40	0			40	2,200	88	88	22	22	0	48	0	\$6	\$90	\$0	\$70
81	Wet Phase	Sodium Bisulfite Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	2,200	818	Retrofit fixture with (2) LED Tubes	6	40	0			240	2,200	528	528	22	132	0	290	0	\$36	\$540	\$0	\$420
82	Wet Phase	Pump Area	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	1	62	62	8,760	543	Retrofit fixture with (2) LED Tubes	1	40	0			40	8,760	350	350	22	22	0	193	0	\$24	\$90	\$0	\$70
83	Wet Phase	Boiler Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	8	62	496	2,200	1,091	Retrofit fixture with (2) LED Tubes	8	40	0			320	2,200	704	704	22	176	0	387	0	\$49	\$720	\$0	\$560
84	Wet Phase	Generator Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	11	62	682	2,200	1,500	Retrofit fixture with (2) LED Tubes	11	40	0			440	2,200	968	968	22	242	0	532	0	\$67	\$990	\$0	\$770
85	Wet Phase	Room Between Boiler and Generator Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	2	62	124	2,200	273	Retrofit fixture with (2) LED Tubes	2	40	0			80	2,200	176	176	22	44	0	97	0	\$12	\$180	\$0	\$140
86	Wet Phase	Electric Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	8	62	496	2,200	1,091	Retrofit fixture with (2) LED Tubes	8	40	0			320	2,200	704	704	22	176	0	387	0	\$49	\$720	\$0	\$560
87	Wet Phase	Secondary Clarifier	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	41	62	2,542	8,760	22,268	Retrofit fixture with (2) LED Tubes	41	40	0			1,640	8,760	14,366	14,366	22	902	0	7,902	0	\$991	\$3,690	\$0	\$2,870
88	Wet Phase	Secondary Clarifier	4' Pendant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	1	75	75	8,760	657	Retrofit fixture with (2) LED Tubes	1	40	0			40	8,760	350	350	35	35	0	307	0	\$38	\$90	\$0	\$70
89	Wet Phase	Secondary Clarifier Bathroom	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	2	62	124	8,760	1,086	Retrofit fixture with (2) LED Tubes	2	40	0			80	8,760	701	701	22	44	0	385	0	\$48	\$180	\$0	\$140
90	Wet Phase	Secondary Clarifier Roof	60 W Induction, Wall Mount	10	60	600	4,300	2,580	None	10	60	0			600	4,300	2,580	2,580	0	0	0	0	0	\$0	\$0	\$0	\$0
91	Wet Phase	Secondary Clarifier Roof	60 W Induction, Light Pole	1	60	60	4,300	258	None	1	60	0			60	4,300	258	258	0	0	0	0	0	\$0	\$0	\$0	\$0
92	Wet Phase	Sublevel	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Prismatic Lens	60	62	3,720	8,760	32,587	Retrofit fixture with (2) LED Tubes	60	40	0			2,400	8,760	21,024	21,024	22	1,320	0	11,563	0	\$1,451	\$5,400	\$0	\$4,200
93	Wet Phase	Pipe Gallery	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Prismatic Lens	16	62	992	8,760	8,690	Retrofit fixture with (2) LED Tubes	16	40	0			640	8,760	5,606	5,606	22	352	0	3,084	0	\$387	\$1,440	\$0	\$1,120
94	Wet Phase	MCC Mezzanine	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Prismatic Lens	9	62	558	2,200	1,228	Retrofit fixture with (2) LED Tubes	9	40	0			360	2,200	792	792	22	198	0	436	0	\$55	\$810	\$0	\$630
95	Wet Phase	Sub-Level Area Near Lime Room	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, Prismatic Lens	24	62	1,488	500	744	Retrofit fixture with (2) LED Tubes	24	40	0			960	500	480	480	22	528	0	264	0	\$33	\$2,160	\$0	\$1,680
96	Wet Phase	Sub-Level Primary	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, Prismatic Lens	33	62	2,046	8,760	17,923	Retrofit fixture with (2) LED Tubes	33	40	0			1,320	8,760	11,563	11,563	22	726	0	6,360	0	\$798	\$2,970	\$0	\$2,310
97	Wet Phase	Sub-Level Primary	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, Prismatic Lens	5	62	310	8,760	2,716	Retrofit fixture with (2) LED Tubes	5	40	0			200	8,760	1,752	1,752	22	110	0	964	0	\$121	\$450	\$0	\$350
98	Wet Phase	MCC Mezzanine Primary	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	6	62	372	500	186	Retrofit fixture with (2) LED Tubes	6	40	0			240	500	120	120	22	132	0	66	0	\$8	\$540	\$0	\$420
99	Wet Phase	MCC Mezzanine Primary	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	4	62	248	500	124	Retrofit fixture with (2) LED Tubes	4	40	0			160	500	80	80	22	88	0	44	0	\$6	\$360	\$0	\$280
100	Wet Phase	Lime Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	12	62	744	500	372	Retrofit fixture with (2) LED Tubes	12	40	0			480	500	240	240	22	264	0	132	0	\$17	\$1,080	\$0	\$840
101	Wet Phase	Ground Level	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	2	62	124	8,760	1,086	Retrofit fixture with (2) LED Tubes	2	40	0			80	8,760	701	701	22	44	0	385	0	\$48	\$180	\$0	\$140
102	Wet Phase	Aeration Roof	60 W Induction, Light Pole	39	60	2,340	4,300	10,062	None	39	60	0			2,340	4,300	10,062	10,062	0	0	0	0	0	\$0	\$0	\$0	\$0



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER:	Wayne Township	FACILITY SQ. FT.	DATE OF AUDIT:
	FACILITY:	Mountain View WPCF (Wet&Dry Phase)	83,980	4/25/2013

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							8760					500															
103	Wet Phase	Primary Cat Walks	60 W Induction, Light Pole	14	60	840	4,300	3,612	None	14	60	0			840	4,300	3,612	3,612	0	0	0	0	0	\$0	\$0	\$0	\$0
104	Wet Phase	Around Aeration Tank	60 W Induction, Light Pole	6	60	360	4,300	1,548	None	6	60	0			360	4,300	1,548	1,548	0	0	0	0	0	\$0	\$0	\$0	\$0
105	Wet Phase	Outside	60 W Induction, Light Pole	20	60	1,200	4,300	5,160	None	20	60	0			1,200	4,300	5,160	5,160	0	0	0	0	0	\$0	\$0	\$0	\$0
106	Wet Phase	Equalization Building	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, No Lens	8	62	496	500	248	Retrofit fixture with (2) LED Tubes	8	40	0			320	500	160	160	22	176	0	88	0	\$11	\$720	\$0	\$560
107	Wet Phase	Behind Equalization Building	60 W Induction, Light Pole	9	60	540	500	270	None	9	60	0			540	500	270	270	0	0	0	0	0	\$0	\$0	\$0	\$0
108	Exterior Light	Exterior Lighting- Back of Stairwell B	60 W Induction, Light Pole	7	60	420	4,300	1,806	None	7	60	0			420	4,300	1,806	1,806	0	0	0	0	0	\$0	\$0	\$0	\$0
109	Exterior Light	Exterior Lighting- Back of Stairwell B	60 W Induction, Light Pole	11	60	660	4,300	2,838	None	11	60	0			660	4,300	2,838	2,838	0	0	0	0	0	\$0	\$0	\$0	\$0
110	Exterior Light	Exterior Lighting- Back of Stairwell B	60 W Induction, Light Pole	8	60	480	4,300	2,064	None	8	60	0			480	4,300	2,064	2,064	0	0	0	0	0	\$0	\$0	\$0	\$0
111	Exterior Light	Exterior Lighting- Back of Stairwell C	60W Incandescent	1	60	60	4,300	258	11W LED Lamp	1	11	0			11	4,300	47	47	49	49	0	211	0	\$26	\$12	\$0	\$12
112	Exterior Light	Exterior Lighting Front of Stairwell C	60 W Induction, Light Pole	4	60	240	4,300	1,032	None	4	60	0			240	4,300	1,032	1,032	0	0	0	0	0	\$0	\$0	\$0	\$0
113	Exterior Light	Exterior Lighting Lab Side	60 W Induction, Light Pole	3	60	180	4,300	774	None	3	60	0			180	4,300	774	774	0	0	0	0	0	\$0	\$0	\$0	\$0
114	Exterior Light	Exterior Lighting - Chlorine/Electric Building Front	60 W Induction, Light Pole	2	60	120	4,300	516	None	2	60	0			120	4,300	516	516	0	0	0	0	0	\$0	\$0	\$0	\$0
115	Exterior Light	Exterior Lighting - Chlorine/Electric Building Back	60 W Induction, Light Pole	2	60	120	4,300	516	None	2	60	0			120	4,300	516	516	0	0	0	0	0	\$0	\$0	\$0	\$0
116	Exterior Light	Chlorine Tank	60 W Induction, Light Pole	10	60	600	500	300	None	10	60	0			600	500	300	300	0	0	0	0	0	\$0	\$0	\$0	\$0
117	Exterior Light	Chlorine Tank	60 W Induction, Light Pole	2	60	120	500	60	None	2	60	0			120	500	60	60	0	0	0	0	0	\$0	\$0	\$0	\$0
118	Exterior Light	Near Central Pump	60 W Induction, Light Pole	2	60	120	4,300	516	None	2	60	0			120	4,300	516	516	0	0	0	0	0	\$0	\$0	\$0	\$0
119	Exterior Light	On the Catwalks	60 W Induction, Light Pole	12	60	720	4,300	3,096	None	12	60	0			720	4,300	3,096	3,096	0	0	0	0	0	\$0	\$0	\$0	\$0
120	Exterior Light	Secondary Clarifier Area Tanks 3&4 Door Light	60W Incandescent	4	60	240	4,300	1,032	11W LED Lamp	4	11	0			44	4,300	189	189	49	196	0	843	0	\$106	\$48	\$0	\$48
				941		60,387		300,625		941				60	41,975		210,665	201,172				89,960	9,493	\$12,478	\$74,304	\$15,000	\$70,424



LIGHTING RETROFIT SUMMARY FOR:
Wayne Township Building
475 Valley Road, Wayne, NJ 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Wayne Township Building	58,400	856	70,333	201,449	1.20	856	48,757	136,008	0.83	21,576	65,441	11,046	76,487	\$9,169	\$1,548	\$10,717	21.6	\$23,630	\$4,655	\$93,740	\$22,870	\$116,610	8.2

20%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
68%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
21%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
14%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL				CUSTOMER: FACILITY: Wayne Township Wayne Township Building				FACILITY SQ. FT. 58,400				DATE OF AUDIT: 4/1/2014			
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SPACE DESCRIPTION									REPLACEMENT FIXTURES									
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR
							2500					300				2200		
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20
1	Health	Nurse's Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300
2	Health	Lobby/Secretary	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	86	602	3,000	1,806	Retrofit fixture with (3) LED Tubes	7	60	300	Ceiling	1	420	2,700	1,260	1,134
3	Health	Clinic Area	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	774	2,500	1,935	Retrofit fixture with (3) LED Tubes	9	60	300	Ceiling	1	540	2,200	1,350	1,188
4	Health	Dental Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300
5	Health	Dental Office	60W Incandescent	1	60	60	2,500	150	11W LED Lamp	1	11	0			11	2,500	28	28
6	Health	Main Lobby Hallway 1	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	3,000	516	Retrofit fixture with (3) LED Tubes	2	60	0			120	3,000	360	360
7	Health	Men's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	2,200	150	132
8	Health	Women's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150
9	Health	Video Room/Comp Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300
10	Health	Janitors Closet	60W Incandescent	1	60	60	2,500	150	11W LED Lamp	1	11	300	Ceiling	1	11	2,200	28	24
11	Health	Fire Bureau	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	774	2,500	1,935	Retrofit fixture with (3) LED Tubes	9	60	300	Ceiling	1	540	2,200	1,350	1,188
12	Health	Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	3,000	258	Retrofit fixture with (3) LED Tubes	1	60	0			60	3,000	180	180
13	Health	Director's Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396
14	Health	Storage	1'x4' Recessed Fixture, Prismatic Lens, w/ (1) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	32	32	2,500	80	Retrofit fixture with (1) LED Tube	1	20	300	Ceiling	1	20	2,200	50	44
15	Health	Storage	1'x4' Recessed Fixture, Prismatic Lens, w/ (1) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	32	64	2,500	160	Retrofit fixture with (1) LED Tube	2	20	300	Ceiling	1	40	2,200	100	88
16	Health	Health Dept.	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	16	86	1,376	2,500	3,440	Retrofit fixture with (3) LED Tubes	16	60	300	Ceiling	1	960	2,200	2,400	2,112
17	Health	Storage	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	1	75	75	2,500	188	Retrofit fixture with (2) LED Tubes	1	40	0			40	2,500	100	100
18	Health	Chief Sanitarian	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300
19	Health	Animal Control	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	0			180	2,500	450	450
20	Health	Health Officer	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528
21	Health	Conference Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300
22	Health	Conference Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300
23	Health	Inspector	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	300	Ceiling	1	120	2,200	300	264
24	Health	Inspector	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	300	Ceiling	1	120	2,200	300	264
25	Health	Inspector	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300
26	Health	Drug Ed	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300
27	Main	Center Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528
28	Main	Staircase 1	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	62	124	8,760	1,086	Retrofit fixture with (2) LED Tubes	2	40	0			80	8,760	701	701
29	Main	Staircase 1	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Wall Mounted, Prismatic Lens	1	35	35	8,760	307	Retrofit fixture with (1) LED Tube	1	20	0			20	8,760	175	175
30	Main	Staircase 2	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	62	124	8,760	1,086	Retrofit fixture with (2) LED Tubes	2	40	300	Wall	1	80	8,460	701	677
31	Main	Staircase 2	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Wall Mounted, Prismatic Lens	1	35	35	8,760	307	Retrofit fixture with (1) LED Tube	1	20	0			20	8,760	175	175
32	Main	Meeting Room 2	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	19	86	1,634	2,500	4,085	Retrofit fixture with (3) LED Tubes	19	60	300	Ceiling	1	1,485	1,700	3,713	2,525
33	Main	Meeting Room 2	Recessed round fixture, w/ (1) 13W Compact Fluorescent Lamp (CFL), No Lens	1	9	9	2,500	23	None	1	9	0			704	2,500	1,760	1,760
34	Main	OEM Office	Wall Mounted-150W Incandescent	9	150	1,350	2,500	3,375	30 Watt LED Lamp	9	30	300	Ceiling	1	450	1,700	1,125	765

ENERGY ANALYSIS						COST ANALYSIS		
WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
					\$0.140			
21	22	23	24	25	26	27	28	29
26	52	0	130	0	\$18	\$240	\$0	\$180
26	182	300	546	126	\$94	\$840	\$250	\$845
26	234	300	585	162	\$105	\$1,080	\$250	\$1,025
26	52	0	130	0	\$18	\$240	\$0	\$180
49	49	0	123	0	\$17	\$0	\$0	\$0
26	52	0	156	0	\$22	\$240	\$0	\$180
26	26	300	65	18	\$12	\$120	\$250	\$305
26	26	0	65	0	\$9	\$120	\$0	\$90
26	52	0	130	0	\$18	\$240	\$0	\$180
49	49	300	123	3	\$18	\$12	\$250	\$227
26	234	300	585	162	\$105	\$1,080	\$250	\$1,025
26	26	0	78	0	\$11	\$0	\$0	\$0
26	78	300	195	54	\$35	\$360	\$250	\$485
12	12	300	30	6	\$5	\$60	\$250	\$265
12	24	300	60	12	\$10	\$120	\$250	\$315
26	416	300	1,040	288	\$186	\$0	\$250	\$0
35	35	0	88	0	\$12	\$0	\$0	\$0
26	52	0	130	0	\$18	\$240	\$0	\$180
26	78	0	195	0	\$27	\$360	\$0	\$270
26	104	300	260	72	\$47	\$480	\$250	\$575
26	52	0	130	0	\$18	\$240	\$0	\$180
26	52	0	130	0	\$18	\$240	\$0	\$180
26	52	300	130	36	\$23	\$240	\$250	\$395
26	52	300	130	36	\$23	\$240	\$250	\$395
26	52	0	130	0	\$18	\$240	\$0	\$180
26	52	0	130	0	\$18	\$240	\$0	\$180
26	104	300	260	72	\$47	\$0	\$250	\$0
22	44	0	385	0	\$54	\$180	\$0	\$140
15	15	0	131	0	\$18	\$60	\$0	\$50
22	44	300	385	24	\$57	\$180	\$120	\$240
15	15	0	131	0	\$18	\$60	\$0	\$50
140	4,620	800	11,550	1,188	\$1,479	\$13,200	\$250	\$13,365
0	0	0	0	0	\$0	\$0	\$0	\$0
140	1,400	800	3,500	360	\$448	\$4,000	\$250	\$4,500



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER:	Wayne Township	FACILITY SQ. FT.	DATE OF AUDIT:
	FACILITY:	Wayne Township Building	58,400	4/1/2014

SPACE DESCRIPTION										REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR		WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							2500					300				2200									\$0.140			
35	Main	Main OEM	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
36	Main	Main OEM	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,500	1,290	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	2,200	900	792		26	156	300	390	108	\$70	\$720	\$250	\$755
37	Main	Closet	60W Incandescent	1	60	60	2,500	150	11W LED Lamp	1	11	0			11	2,500	28	28		49	49	0	123	0	\$17	\$12	\$0	\$12
38	Main	MIS Secretary	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	3,500	301	Retrofit fixture with (3) LED Tubes	1	60	0			60	3,500	210	210		26	26	0	91	0	\$13	\$120	\$0	\$90
39	Main	Closet	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
40	Main	Computer Lab	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528		26	104	300	260	72	\$47	\$480	\$250	\$575
41	Main	Corridor	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	3,000	258	Retrofit fixture with (3) LED Tubes	1	60	0			60	3,000	180	180		26	26	0	78	0	\$11	\$120	\$0	\$90
42	Main	MIS Dept.	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	3,500	1,204	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	3,200	840	768		26	104	300	364	72	\$61	\$480	\$250	\$575
43	Main	Server Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	10	62	620	2,500	1,550	Retrofit fixture with (2) LED Tubes	10	40	300	Ceiling	1	400	2,200	1,000	880		22	220	300	550	120	\$94	\$900	\$250	\$915
44	Main	Office	1'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	2	107	213	2,500	534	Retrofit fixture with (4) LED Tubes	2	80	0			160	2,500	400	400		27	53	0	134	0	\$19	\$300	\$0	\$220
45	Main	Directors Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$0	\$0	\$0
46	Main	Boiler Room	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	9	75	675	2,500	1,688	Retrofit fixture with (2) LED Tubes	9	40	300	Ceiling	1	360	2,200	900	792		35	315	300	788	108	\$125	\$0	\$250	\$0
47	Main	MIS Corridor 1	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	3,500	903	Retrofit fixture with (3) LED Tubes	3	60	0			180	3,500	630	630		26	78	0	273	0	\$38	\$0	\$0	\$0
48	Main	MIS Corridor 2	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	3,500	1,204	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	3,200	840	768		26	104	300	364	72	\$61	\$0	\$250	\$0
49	Main	Storage - Taxes	2'x4' Surface Fixture, No Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,500	1,601	Retrofit fixture with (4) LED Tubes	6	80	300	Ceiling	1	480	2,200	1,200	1,056		27	160	300	401	144	\$76	\$900	\$250	\$875
50	Main	Storage - Taxes	2'x4' Recessed Fixture, Prismatic Lens, w/ (3) F40T12/34w Lamps & (1) Magnetic Ballast	1	117	117	2,500	293	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150		57	57	0	143	0	\$20	\$120	\$0	\$90
51	Main	Old Boiler Room - MIS	60W Incandescent	3	60	180	2,500	450	11W LED Lamp	3	11	300	Ceiling	1	33	2,200	83	73		49	147	300	368	10	\$53	\$36	\$250	\$251
52	Main	Old Boiler Room - MIS	Wall Mounted-150W Incandescent	1	150	150	2,500	375	30 Watt LED Lamp	1	30	0			30	2,500	75	75		120	120	0	300	0	\$42	\$50	\$0	\$40
53	Main	Gym	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	86	603	2,500	1,509	Retrofit fixture with (3) LED Tubes	7	60	300	Ceiling	1	420	2,200	1,050	924		26	183	300	459	126	\$82	\$840	\$250	\$845
54	Main	Gym	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	216	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150		26	26	0	66	0	\$9	\$120	\$0	\$90
55	Main	Shower Area	Screw-in Compact Fluorescent Lamp (23W)	1	23	23	2,500	58	None	1	23	0			23	2,500	58	58		0	0	0	0	0	\$0	\$0	\$0	\$0
56	Main	Men's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150		26	26	0	65	0	\$9	\$120	\$0	\$90
57	Main	Women's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150		26	26	0	65	0	\$9	\$120	\$0	\$90
58	Main	Women's Health	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	688	2,500	1,720	Retrofit fixture with (3) LED Tubes	8	60	300	Ceiling	1	480	2,200	1,200	1,056		26	208	300	520	144	\$93	\$960	\$250	\$935
59	Main	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
60	Main	Public Safety	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	4	75	300	3,500	1,050	Retrofit fixture with (2) LED Tubes	4	40	300	Ceiling	1	160	3,200	560	512		35	140	300	490	48	\$75	\$360	\$250	\$495
61	Main	Public Safety	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	2	75	150	3,500	525	Retrofit fixture with (2) LED Tubes	2	40	0			80	3,500	280	280		35	70	0	245	0	\$34	\$180	\$0	\$140
62	Main	Public Safety	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	1	75	75	3,500	263	Retrofit fixture with (2) LED Tubes	1	40	0			40	3,500	140	140		35	35	0	123	0	\$17	\$90	\$0	\$70
63	Main	Closet	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	2	75	150	2,500	375	Retrofit fixture with (2) LED Tubes	2	40	0			80	2,500	200	200		35	70	0	175	0	\$25	\$180	\$0	\$140
64	Main	Storage	Recessed downlights with PAR 38, 75W Incandescent lamps	2	75	150	2,500	375	Relamp 18W LED PAR 38 Lamp	2	18	0			36	2,500	90	90		57	114	0	285	0	\$40	\$100	\$0	\$60
65	Main	Staircase 3	4ft Wall Mounted Fixture, Prismatic Lens, w/ (2) F32T8/40w Lamps & (1) Electronic Ballast	1	62	62	8,760	543	Retrofit fixture with (2) LED Tubes	1	40	0			40	8,760	350	350		22	22	0	193	0	\$27	\$90	\$0	\$70
66	Main	Staircase 3	Recessed round fixture w/ No Lens w/ (1) 14W Compact Fluorescent Lamp (CFL)	1	14	14	8,760	123	None	1	14	0			14	8,760	123	123		0	0	0	0	0	\$0	\$0	\$0	\$0
67	Main	Health Wing Mail Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
68	Main	Social Services	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528		26	104	300	260	72	\$47	\$480	\$250	\$575



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: FACILITY: Wayne Township Wayne Township Building				FACILITY SQ. FT. 58,400			DATE OF AUDIT: 4/1/2014	
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SPACE DESCRIPTION										REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR		WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							2500					300				2200									\$0.140			
69	Main	Social Services	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
70	Main	Violations	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	20	86	1,720	2,500	4,300	Retrofit fixture with (3) LED Tubes	20	60	300	Ceiling	1	1,200	2,200	3,000	2,640		26	520	300	1,300	360	\$233	\$2,400	\$250	\$2,015
71	Main	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
72	Main	Judges Chamber	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
73	Main	Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	3,000	1,032	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,700	720	648		26	104	300	312	72	\$54	\$480	\$250	\$575
74	Main	Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	3,000	516	Retrofit fixture with (3) LED Tubes	2	60	0			120	3,000	360	360		26	52	0	156	0	\$22	\$240	\$0	\$180
75	Main	Women's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
76	Main	Women's Room	Wall Mounted 4'Strip Fixture, Prismatic Lens, w/ (1) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	3	40	119	2,500	298	Retrofit fixture with (1) LED Tube	3	20	300	Ceiling	1	60	2,200	150	132		20	59	300	148	18	\$23	\$180	\$250	\$365
77	Main	Men's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
78	Main	Public Works Lobby	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	3,000	516	Retrofit fixture with (3) LED Tubes	2	60	0			120	3,000	360	360		26	52	0	156	0	\$22	\$240	\$0	\$180
79	Main	Public Works Main	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	20	86	1,720	3,000	5,160	Retrofit fixture with (3) LED Tubes	20	60	300	Ceiling	1	1,200	2,700	3,600	3,240		26	520	300	1,560	360	\$269	\$2,400	\$250	\$2,015
80	Main	Public Works Director	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
81	Main	Recycling	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
82	Main	Town Engineer	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528		26	104	300	260	72	\$47	\$480	\$250	\$575
83	Main	Engineering Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528		26	104	300	260	72	\$47	\$480	\$250	\$575
84	Main	Engineering Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528		26	104	300	260	72	\$47	\$480	\$250	\$575
85	Main	Engineering Back Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,032	2,500	2,580	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	2,200	1,800	1,584		26	312	300	780	216	\$140	\$1,440	\$250	\$1,295
86	Main	Parks/Rec Reception	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
87	Main	Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	3,000	774	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,700	540	486		26	78	300	234	54	\$40	\$360	\$250	\$485
88	Main	Vestibule	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150		26	26	0	65	0	\$9	\$120	\$0	\$90
89	Main	Parks/Rec Main	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	688	2,500	1,720	Retrofit fixture with (3) LED Tubes	8	60	300	Ceiling	1	480	2,200	1,200	1,056		26	208	300	520	144	\$93	\$960	\$250	\$935
90	Main	Parks/Rec Director	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
91	Main	Closet	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150		26	26	0	65	0	\$9	\$120	\$0	\$90
92	Main	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
93	Main	Conference Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
94	Main	Director	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528		26	104	300	260	72	\$47	\$480	\$250	\$575
95	Main	Zoning Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
96	Main	Zoning Main Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,500	1,290	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	2,200	900	792		26	156	300	390	108	\$70	\$720	\$250	\$755
97	Main	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
98	Main	Zoning File	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
99	Main	Circular Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	774	3,000	2,322	Retrofit fixture with (3) LED Tubes	9	60	300	Ceiling	1	540	2,700	1,620	1,458		26	234	300	702	162	\$121	\$1,080	\$250	\$1,025
100	Main	Treasurer Main	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	50	86	4,300	2,500	10,750	Retrofit fixture with (3) LED Tubes	50	60	300	Ceiling	1	3,000	2,200	7,500	6,600		26	1,300	300	3,250	900	\$581	\$6,000	\$250	\$4,715
101	Main	Treasurer Kitchenette	4ft Wall Mounted Fixture, Prismatic Lens, w/ (2) F32T8/40w Lamps & (1) Electronic Ballast	1	62	62	2,500	155	Retrofit fixture with (2) LED Tubes	1	40	0			40	2,500	100	100		22	22	0	55	0	\$8	\$90	\$0	\$70
102	Main	Treasurer Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528		26	104	300	260	72	\$47	\$480	\$250	\$575



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: Wayne Township FACILITY: Wayne Township Building				FACILITY SQ. FT. 58,400			DATE OF AUDIT: 4/1/2014	
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SPACE DESCRIPTION										REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR		WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							2500					300				2200									\$0.140			
103	Main	Storage/File Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,500	267	Retrofit fixture with (4) LED Tubes	1	80	0			80	2,500	200	200		27	27	0	67	0	\$9	\$150	\$0	\$110
104	Main	Storage/File Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,500	267	Retrofit fixture with (4) LED Tubes	1	80	0			80	2,500	200	200		27	27	0	67	0	\$9	\$150	\$0	\$110
105	Main	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
106	Main	Chief Assessor	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
107	Main	Council Chamber	Recessed round fixture, No lens w/ (1) 26W Compact Fluorescent Lamp (CFL)	53	26	1,378	2,500	3,445	None	53	26	300	Ceiling	1	1,378	2,200	3,445	3,032		0	0	300	0	413	\$58	\$0	\$250	\$215
108	Main	Basement Hall	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	216	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150		26	26	0	66	0	\$9	\$120	\$0	\$90
109	Main	Basement Hall	Surface Mount, w/ (1) 13W Compact Fluorescent Lamp (CFL), No Lens	3	13	39	2,500	98	None	3	13	300	Ceiling	1	39	2,200	98	86		0	0	300	0	12	\$2	\$0	\$250	\$215
110	Main	Work Room	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,500	1,293	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	2,200	900	792		26	157	300	393	108	\$70	\$720	\$250	\$755
111	Admin/Police	Maintenance Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	431	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	131	0	\$18	\$240	\$0	\$180
112	Admin/Police	Maintenance Office	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	216	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150		26	26	0	66	0	\$9	\$120	\$0	\$90
113	Admin/Police	Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,500	1,290	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	2,200	900	792		26	156	300	390	108	\$70	\$720	\$250	\$755
114	Admin/Police	Records	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,204	2,500	3,010	Retrofit fixture with (3) LED Tubes	14	60	300	Ceiling	1	840	2,200	2,100	1,848		26	364	300	910	252	\$163	\$1,680	\$250	\$1,475
115	Admin/Police	Coffee Area	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
116	Admin/Police	Dark Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
117	Admin/Police	Chief's Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	0			240	2,500	600	600		26	104	0	260	0	\$36	\$480	\$0	\$360
118	Admin/Police	Chief's Secretary	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
119	Admin/Police	Youth Bureau	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	86	602	2,500	1,505	Retrofit fixture with (3) LED Tubes	7	60	0			420	2,500	1,050	1,050		26	182	0	455	0	\$64	\$840	\$0	\$630
120	Admin/Police	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	0			240	2,500	600	600		26	104	0	260	0	\$36	\$480	\$0	\$360
121	Admin/Police	Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	0			180	2,500	450	450		26	78	0	195	0	\$27	\$360	\$0	\$270
122	Admin/Police	Youth Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396		26	78	300	195	54	\$35	\$360	\$250	\$485
123	Admin/Police	Vestibule	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) F20T12/34w Lamps & (1) Magnetic Ballast	1	42	42	2,500	104	Retrofit fixture with (2) LED Tubes	1	30	0			30	2,500	75	75		12	12	0	29	0	\$4	\$60	\$0	\$40
124	Admin/Police	Special Operations	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,500	1,290	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	2,200	900	792		26	156	300	390	108	\$70	\$720	\$250	\$755
125	Admin/Police	Deputy Chief	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	3,000	516	Retrofit fixture with (3) LED Tubes	2	60	0			120	3,000	360	360		26	52	0	156	0	\$22	\$240	\$0	\$180
126	Admin/Police	Captain of Investigations	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	3,500	602	Retrofit fixture with (3) LED Tubes	2	60	0			120	3,500	420	420		26	52	0	182	0	\$26	\$240	\$0	\$180
127	Admin/Police	Patrol	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	8,760	4,520	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	8,460	3,154	3,046		26	156	300	1,367	108	\$207	\$720	\$250	\$755
128	Admin/Police	Storage 1	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
129	Admin/Police	Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,500	1,290	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	2,200	900	792		26	156	300	390	108	\$70	\$720	\$250	\$755
130	Admin/Police	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
131	Admin/Police	Booking	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,507	Retrofit fixture with (3) LED Tubes	2	60	0			120	8,760	1,051	1,051		26	52	0	456	0	\$64	\$240	\$0	\$180
132	Admin/Police	Interview Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
133	Admin/Police	Cell #5	Wall Mounted-100W Incandescent	1	100	100	2,500	250	20 Watt LED Lamp	1	20	0			20	2,500	50	50		80	80	0	200	0	\$28	\$40	\$0	\$30
134	Admin/Police	Detective	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	86	860	2,500	2,150	Retrofit fixture with (3) LED Tubes	10	60	300	Ceiling	1	600	2,200	1,500	1,320		26	260	300	650	180	\$116	\$1,200	\$250	\$1,115
135	Admin/Police	Commander	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300		26	52	0	130	0	\$18	\$240	\$0	\$180
136	Admin/Police	Cells 1,2,3,4	Wall Mounted-100W Incandescent	8	100	800	2,500	2,000	20 Watt LED Lamp	8	20	300	Ceiling	1	160	2,200	400	352		80	640	300	1,600	48	\$231	\$320	\$250	\$455



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SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							2500					300				2200								\$0.140			
137	Admin/Police	Warrant Office	Recessed downlights with PAR 38, 75W Incandescent lamps	16	75	1,200	8,760	10,512	Relamp 18W LED PAR 38 Lamp	16	18	300	Ceiling	1	288	8,460	2,523	2,436	57	912	300	7,989	86	\$1,132	\$800	\$250	\$695
138	Admin/Police	Old Dispatch	Recessed downlights with PAR 38, 75W Incandescent lamps	14	75	1,050	2,500	2,625	Relamp 18W LED PAR 38 Lamp	14	18	300	Ceiling	1	252	2,200	630	554	57	798	300	1,995	76	\$290	\$700	\$250	\$635
139	Admin/Police	Radio/Storage Room	Wall Mounted-100W Incandescent	1	100	100	2,500	250	20 Watt LED Lamp	1	20	0			20	2,500	50	50	80	80	0	200	0	\$28	\$40	\$0	\$30
140	Admin/Police	Staircase	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	8,760	753	Retrofit fixture with (3) LED Tubes	1	60	0			60	8,760	526	526	26	26	0	228	0	\$32	\$120	\$0	\$90
141	Admin/Police	Basement Hall	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	66	132	2,500	330	Retrofit fixture with (2) LED Tubes	2	40	0			80	2,500	200	200	26	52	0	130	0	\$18	\$180	\$0	\$140
142	Admin/Police	Locker Room	Surface Mounted 4'Strip Fixture, No Lens, w/ (1) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	12	40	476	2,500	1,191	Retrofit fixture with (1) LED Tube	12	20	300	Ceiling	1	240	2,200	600	528	20	236	300	591	72	\$93	\$720	\$250	\$815
143	Admin/Police	Locker Room	Wall Mounted-100W Incandescent	1	100	100	2,500	250	20 Watt LED Lamp	1	20	0			20	2,500	50	50	80	80	0	200	0	\$28	\$40	\$0	\$30
144	Admin/Police	Evidence Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300	26	52	0	130	0	\$18	\$240	\$0	\$180
145	Admin/Police	Traffic Bureau	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,500	2,365	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	2,200	1,650	1,452	26	286	300	715	198	\$128	\$1,320	\$250	\$1,205
146	Admin/Police	Bathroom	Surface Mounted 4'Strip Fixture, No Lens, w/ (1) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	4	40	159	2,500	397	Retrofit fixture with (1) LED Tube	4	20	300	Ceiling	1	80	2,200	200	176	20	79	300	197	24	\$31	\$240	\$250	\$415
147	Admin/Police	Traffic Bureau Hallway	Surface Mounted 4'Strip Fixture, No Lens, w/ (1) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	1	40	40	2,500	99	Retrofit fixture with (1) LED Tube	1	20	0			20	2,500	50	50	20	20	0	49	0	\$7	\$60	\$0	\$50
148	Admin/Police	Storage	Surface Mounted 4'Strip Fixture, No Lens, w/ (1) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	2	40	79	2,500	199	Retrofit fixture with (1) LED Tube	2	20	0			40	2,500	100	100	20	39	0	99	0	\$14	\$120	\$0	\$100
149	Admin/Police	Storage	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Surface Mount, No Lens	1	35	35	2,500	88	Retrofit fixture with (1) LED Tube	1	20	0			20	2,500	50	50	15	15	0	38	0	\$5	\$60	\$0	\$50
150	Admin/Police	Police Lobby	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	430	8,760	3,767	Retrofit fixture with (3) LED Tubes	5	60	300	Ceiling	1	300	8,460	2,628	2,538	26	130	300	1,139	90	\$172	\$600	\$250	\$665
151	Admin/Police	Men's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300	26	52	0	130	0	\$18	\$240	\$0	\$180
152	Admin/Police	Women's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300	26	52	0	130	0	\$18	\$240	\$0	\$180
153	Admin/Police	Elevator Room	Surface Mounted 4'Strip Fixture, No Lens, w/ (1) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	2	40	79	2,500	199	Retrofit fixture with (1) LED Tube	2	20	0			40	2,500	100	100	20	39	0	99	0	\$14	\$120	\$0	\$100
154	Admin/Police	Staircase	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	8,760	3,013	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	8,460	2,102	2,030	26	104	300	911	72	\$138	\$480	\$250	\$575
155	Admin/Police	Admin Basement Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300	26	52	0	130	0	\$18	\$240	\$0	\$180
156	Admin/Police	Admin Basement Hallway	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	1	62	62	2,500	155	Retrofit fixture with (2) LED U-Tubes	1	52	0			52	2,500	130	130	10	10	0	25	0	\$4	\$90	\$0	\$70
157	Admin/Police	Dispatch Room	2'x4' Recessed Troffer, Direct/Indirect Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	8,760	2,172	Retrofit fixture with (2) LED Tubes	4	40	300	Ceiling	1	160	8,460	1,402	1,354	22	88	300	771	48	\$115	\$360	\$250	\$495
158	Admin/Police	Commander Office	2'x4' Recessed Troffer, Direct/Indirect Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	8,760	543	Retrofit fixture with (2) LED Tubes	1	40	0			40	8,760	350	350	22	22	0	193	0	\$27	\$90	\$0	\$70
159	Admin/Police	Hallway	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,500	862	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528	26	105	300	262	72	\$47	\$480	\$250	\$575
160	Admin/Police	Hallway	1'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,500	155	Retrofit fixture with (2) LED Tubes	1	40	0			40	2,500	100	100	22	22	0	55	0	\$8	\$90	\$0	\$70
161	Admin/Police	Lunch Area	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,500	647	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396	26	79	300	197	54	\$35	\$360	\$250	\$485
162	Admin/Police	Storage	2'x4' Surface Fixture, No Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,500	534	Retrofit fixture with (4) LED Tubes	2	80	0			160	2,500	400	400	27	53	0	134	0	\$19	\$300	\$0	\$220
163	Admin/Police	Print Shop	2'x4' Surface Mount, No Lens, w/ (3) F40T12/34w Lamps & (1) Magnetic Ballast	3	117	351	2,500	878	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396	57	171	300	428	54	\$67	\$360	\$250	\$485
164	Admin/Police	Print Shop	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	216	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150	26	26	0	66	0	\$9	\$120	\$0	\$90
165	Admin/Police	Print Shop	2'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	2,500	360	Retrofit fixture with (4) LED Tubes	1	80	0			80	2,500	200	200	64	64	0	160	0	\$22	\$150	\$0	\$110
166	Admin/Police	Print Shop	1'x4' Surface Fixture, No Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	3	66	198	2,500	495	Retrofit fixture with (2) LED Tubes	3	40	300	Ceiling	1	120	2,200	300	264	26	78	300	195	36	\$32	\$270	\$250	\$425
167	Admin/Police	Storage	2'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	2	144	288	2,500	720	Retrofit fixture with (4) LED Tubes	2	80	0			160	2,500	400	400	64	128	0	320	0	\$45	\$300	\$0	\$220
168	Admin/Police	Boiler Room	Surface Mount Strip, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	6	75	450	2,500	1,125	Retrofit fixture with (2) LED Tubes	6	40	300	Ceiling	1	240	2,200	600	528	35	210	300	525	72	\$84	\$540	\$250	\$635
169	Admin/Police	Admin Boiler Room	2'x4' Surface Fixture, No Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,500	267	Retrofit fixture with (4) LED Tubes	1	80	0			80	2,500	200	200	27	27	0	67	0	\$9	\$150	\$0	\$110
170	Admin/Police	Admin Hallway Main	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300	26	52	0	130	0	\$18	\$240	\$0	\$180



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: FACILITY:		Wayne Township Wayne Township Building		FACILITY SQ. FT. 58,400		DATE OF AUDIT: 4/1/2014	
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SPACE DESCRIPTION										REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES	
							2500					300				2200								\$0.140				
171	Admin/Police	2nd Level Main Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	0			240	2,500	600	600	26	104	0	260	0	\$36	\$480	\$0	\$360	
172	Admin/Police	Legal Department	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	62	496	2,500	1,240	Retrofit fixture with (2) LED Tubes	8	40	0			320	2,500	800	800	22	176	0	440	0	\$62	\$720	\$0	\$560	
173	Admin/Police	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,500	430	Retrofit fixture with (3) LED Tubes	2	60	0			120	2,500	300	300	26	52	0	130	0	\$18	\$240	\$0	\$180	
174	Admin/Police	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396	26	78	300	195	54	\$35	\$360	\$250	\$485	
175	Admin/Police	Clerk's Office	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	62	496	2,500	1,240	Retrofit fixture with (2) LED Tubes	8	40	300	Ceiling	1	320	2,200	800	704	22	176	300	440	96	\$75	\$720	\$250	\$775	
176	Admin/Police	Conference Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	2,200	450	396	26	78	300	195	54	\$35	\$360	\$250	\$485	
177	Admin/Police	File Room	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	35	35	2,500	88	Retrofit fixture with (1) LED Tube	1	20	0			20	2,500	50	50	15	15	0	38	0	\$5	\$60	\$0	\$50	
178	Admin/Police	Deputy Clerk Office	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,500	620	Retrofit fixture with (2) LED Tubes	4	40	300	Ceiling	1	160	2,200	400	352	22	88	300	220	48	\$38	\$360	\$250	\$495	
179	Admin/Police	Office	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,500	465	Retrofit fixture with (2) LED Tubes	3	40	0			120	2,500	300	300	22	66	0	165	0	\$23	\$0	\$0	\$0	
180	Admin/Police	Purchasing Department	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	20	86	1,720	2,500	4,300	Retrofit fixture with (3) LED Tubes	20	60	0			1,200	2,500	3,000	3,000	26	520	0	1,300	0	\$182	\$2,400	\$0	\$1,800	
181	Admin/Police	Copy Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150	26	26	0	65	0	\$9	\$120	\$0	\$90	
182	Admin/Police	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528	26	104	300	260	72	\$47	\$480	\$250	\$575	
183	Admin/Police	Conference Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528	26	104	300	260	72	\$47	\$480	\$250	\$575	
184	Admin/Police	Director of HR	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528	26	104	300	260	72	\$47	\$480	\$250	\$575	
185	Admin/Police	BA Secretary	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528	26	104	300	260	72	\$47	\$480	\$250	\$575	
186	Admin/Police	BA Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,500	1,290	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	2,200	900	792	26	156	300	390	108	\$70	\$720	\$250	\$755	
187	Admin/Police	Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528	26	104	300	260	72	\$47	\$480	\$250	\$575	
188	Admin/Police	Mayor Secretary	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528	26	104	300	260	72	\$47	\$480	\$250	\$575	
189	Admin/Police	Mayor's Office	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,500	1,290	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	2,200	900	792	26	156	300	390	108	\$70	\$720	\$250	\$755	
190	Admin/Police	Township Attorney	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,500	860	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	2,200	600	528	26	104	300	260	72	\$47	\$480	\$250	\$575	
191	Admin/Police	Admin Kitchen	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150	26	26	0	65	0	\$9	\$120	\$0	\$90	
192	Admin/Police	Mayor's Conference Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	430	2,500	1,075	Retrofit fixture with (3) LED Tubes	5	60	300	Ceiling	1	300	2,200	750	660	26	130	300	325	90	\$58	\$600	\$250	\$665	
193	Admin/Police	Men's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150	26	26	0	65	0	\$9	\$120	\$0	\$90	
194	Admin/Police	Men's Room	4ft Wall Mounted Fixture, No Lens, w/ (2) F32T8/40w Lamps & (1) Electronic Ballast	2	62	124	2,500	310	Retrofit fixture with (2) LED Tubes	2	40	0			80	2,500	200	200	22	44	0	110	0	\$15	\$180	\$0	\$140	
195	Admin/Police	Women's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,500	215	Retrofit fixture with (3) LED Tubes	1	60	0			60	2,500	150	150	26	26	0	65	0	\$9	\$120	\$0	\$90	
196	Admin/Police	Women's Room	4ft Wall Mounted Fixture, No Lens, w/ (2) F32T8/40w Lamps & (1) Electronic Ballast	2	62	124	2,500	310	Retrofit fixture with (2) LED Tubes	2	40	0			80	2,500	200	200	22	44	0	110	0	\$15	\$180	\$0	\$140	
197	Exterior	Pole Lights by Front Parking Lot	Pendant LED Fixtures 160W	9	160	1,440	2,500	3,600	None	9	160	0			1,440	2,500	3,600	3,600	0	0	0	0	0	\$0	\$0	\$0	\$0	
198	Exterior	Exterior - Police HQ	Pendant LED Fixtures 160W	2	160	320	2,500	800	None	2	160	0			320	2,500	800	800	0	0	0	0	0	\$0	\$0	\$0	\$0	
199	Exterior	Exterior - Police HQ	Pendant LED Fixtures 160W	6	160	960	2,500	2,400	None	6	160	300	Ceiling	1	960	2,200	2,400	2,112	0	0	300	0	288	\$40	\$0	\$250	\$215	
200	Exterior	Exterior - Police HQ	150 W Metal Halide Wall Pack in Shoebox	1	185	185	2,500	463	45 Watt LED Wall Mount	1	45	0			45	2,500	113	113	140	140	0	350	0	\$49	\$400	\$0	\$300	
199	Exterior	Exterior - Police HQ	Pendant LED Fixtures 160W	6	160	960	2,500	2,400	None	6	160	300	Ceiling	1	960	2,200	2,400	2,112	0	0	300	0	288	\$40	\$0	\$250	\$215	
201	Exterior	Canopy Lights (Entrance)	Pendant LED Fixtures 160W	9	160	1,440	2,500	3,600	None	9	160	0			1,440	2,500	3,600	3,600	0	0	0	0	0	\$0	\$0	\$0	\$0	
202	Exterior	Exterior - Health Center	150 W Metal Halide Wall Pack in Shoebox	1	185	185	2,500	463	45 Watt LED Wall Mount	1	45	0			45	2,500	113	113	140	140	0	350	0	\$49	\$400	\$0	\$300	
				856		70,333		201,449		856				92	48,757		136,008	124,962				79,606	11,046	\$12,304	\$93,740	\$22,870	\$93,700	



LIGHTING RETROFIT SUMMARY FOR:
Wayne Public Library
461 Valley Road, wayne, NJ 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Wayne Public Library	37,554	812	67,562	230,087	1.80	812	45,610	156,028	1.21	21,952	74,059	20,734	94,793	\$10,693	\$2,994	\$13,687	24.5	\$21,180	\$1,680	\$93,104	\$12,000	\$105,104	6.0

20%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
68%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
38%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
26%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: FACILITY: Wayne Township Wayne Public Library				FACILITY SQ. FT. 37,554			DATE OF AUDIT: 4/1/2014	
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SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
1	2	3	4	5	6	7	3458	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	Library	Garage	4' Pendant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	6	75	450	500	225	Retrofit fixture with (2) LED Tubes	6	40	500	Ceiling	1	240	0	120	0	35	210	500	105	120	\$32	\$540	\$250	\$635
2	Library	Garage	Pendant 4'Strip Fixture, No Lens, w/ (1) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	3	40	119	500	60	Retrofit fixture with (1) LED Tube	3	20	500	Ceiling	1	60	0	30	0	20	59	500	30	30	\$9	\$180	\$250	\$365
3	Library	Garage	2'x4' Pendant Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Magnetic Ballast	2	78	156	500	78	Retrofit fixture with (2) LED Tubes	2	40	0			80	500	40	40	38	76	0	38	0	\$5	\$180	\$0	\$140
4	Library	Receiving Office	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	3,458	1,192	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,958	830	710	26	105	500	362	120	\$70	\$480	\$250	\$575
5	Library	Receiving Office	1'x4' Surface Mount, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	3,458	214	Retrofit fixture with (2) LED Tubes	1	40	0			40	3,458	138	138	22	22	0	76	0	\$11	\$90	\$0	\$70
6	Library	Boiler Room	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Retrofit fixture with (3) LED Tubes	1	60	0			60	500	30	30	26	26	0	13	0	\$2	\$120	\$0	\$90
7	Library	Boiler Room	60W Incandescent	2	60	120	500	60	11W LED Lamp	2	11	0			22	500	11	11	49	98	0	49	0	\$7	\$24	\$0	\$24
8	Library	Quiet Room	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	86	603	3,458	2,087	Retrofit fixture with (3) LED Tubes	7	60	500	Ceiling	1	420	2,958	1,452	1,242	26	183	500	634	210	\$122	\$840	\$250	\$845
9	Library	Closet Near Quiet Room	1'x4' Surface Mount, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	500	31	Retrofit fixture with (2) LED Tubes	1	40	0			40	500	20	20	22	22	0	11	0	\$2	\$90	\$0	\$70
10	Library	Technical Services	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	86	860	3,458	2,974	Retrofit fixture with (3) LED Tubes	10	60	500	Ceiling	1	600	2,958	2,075	1,775	26	260	500	899	300	\$173	\$1,200	\$250	\$1,115
11	Library	Tech Serv - Supervisor's Old Ofc	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	3,458	1,190	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,958	830	710	26	104	500	360	120	\$69	\$480	\$250	\$575
12	Library	Tech Serv - Old Director's Ofc	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	3,458	1,190	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,958	830	710	26	104	500	360	120	\$69	\$480	\$250	\$575
13	Library	Adult Services	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,204	3,458	4,163	Retrofit fixture with (3) LED Tubes	14	60	500	Ceiling	1	840	2,958	2,905	2,485	26	364	500	1,259	420	\$242	\$1,680	\$250	\$1,475
14	Library	Closet/Power Rm	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	62	62	500	31	Retrofit fixture with (2) LED Tubes	1	40	0			40	500	20	20	22	22	0	11	0	\$2	\$90	\$0	\$70
15	Library	Reference Area Back	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	62	86	5,332	3,458	18,438	Retrofit fixture with (3) LED Tubes	62	60	500	Ceiling	2	3,720	2,958	12,864	11,004	26	1,612	500	5,574	1,860	\$1,073	\$7,440	\$500	\$6,010
16	Library	Reference Area Back	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	4	62	248	3,458	858	Retrofit fixture with (2) LED U-Tubes	4	52	500	Ceiling	1	208	2,958	719	615	10	40	500	138	104	\$35	\$360	\$250	\$495
17	Library	South East Main Area	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	59	107	6,295	3,458	21,769	Retrofit fixture with (4) LED Tubes	59	80	500	Ceiling	2	4,720	2,958	16,322	13,962	27	1,575	500	5,447	2,360	\$1,127	\$8,850	\$500	\$6,920
18	Library	South East Main Area	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	42	35	1,470	3,458	5,083	Retrofit fixture with (1) LED Tube	42	20	500	Ceiling	2	840	2,958	2,905	2,485	15	630	500	2,179	420	\$375	\$2,520	\$500	\$2,530
19	Library	South East Main Area	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	58	35	2,030	3,458	7,020	Retrofit fixture with (1) LED Tube	58	20	500	Ceiling	2	1,160	2,958	4,011	3,431	15	870	500	3,008	580	\$518	\$3,480	\$500	\$3,330
20	Library	Quiet Room #2	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	3,458	596	Retrofit fixture with (3) LED Tubes	2	60	0			120	3,458	415	415	26	52	0	181	0	\$26	\$240	\$0	\$180
21	Library	Elevator	2'x4' Pendant Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Magnetic Ballast	4	78	312	500	156	Retrofit fixture with (2) LED Tubes	4	40	500	Ceiling	1	160	0	80	0	38	152	500	76	80	\$23	\$360	\$250	\$495
22	Library	Stairwell Near Quiet Room #2	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	5,000	431	Retrofit fixture with (3) LED Tubes	1	60	0			60	5,000	300	300	26	26	0	131	0	\$19	\$120	\$0	\$90
23	Library	Stairwell Near Quiet Room #2	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	5,000	430	Retrofit fixture with (3) LED Tubes	1	60	0			60	5,000	300	300	26	26	0	130	0	\$19	\$120	\$0	\$90
24	Library	Storage Room Near Quiet Room #2	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	500	86	Retrofit fixture with (3) LED Tubes	2	60	0			120	500	60	60	26	52	0	26	0	\$4	\$240	\$0	\$180
25	Library	Storage Room Near Quiet Room #2	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	431	500	216	Retrofit fixture with (3) LED Tubes	5	60	500	Ceiling	1	300	0	150	0	26	131	500	66	150	\$31	\$600	\$250	\$665
26	Library	Conference	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	86	603	3,458	2,087	Retrofit fixture with (3) LED Tubes	7	60	0			420	3,458	1,452	1,452	26	183	0	634	0	\$92	\$840	\$0	\$630
27	Library	Board Room Corridor	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	43	86	3,707	5,000	18,533	Retrofit fixture with (3) LED Tubes	43	60	500	Ceiling	2	2,580	4,500	12,900	11,610	26	1,127	500	5,633	1,290	\$1,000	\$5,160	\$500	\$4,300
28	Library	Training Center	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	3,458	1,788	Retrofit fixture with (3) LED Tubes	6	60	500	Ceiling	1	360	2,958	1,245	1,065	26	157	500	544	180	\$104	\$720	\$250	\$755
29	Library	Trailing Center Board Room	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	3,458	596	Retrofit fixture with (3) LED Tubes	2	60	0			120	3,458	415	415	26	52	0	181	0	\$26	\$240	\$0	\$180
30	Library	Training Center	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	3,458	1,192	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,958	830	710	26	105	500	362	120	\$70	\$480	\$250	\$575
31	Library	Computer Storage	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	500	172	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	0	120	0	26	105	500	52	120	\$25	\$480	\$250	\$575
32	Library	Print Room	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	3,458	1,192	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,958	830	710	26	105	500	362	120	\$70	\$480	\$250	\$575
33	Library	Business Manager	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	3,458	1,192	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,958	830	710	26	105	500	362	120	\$70	\$480	\$250	\$575
34	Library	Business Assistant	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	3,458	1,192	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,958	830	710	26	105	500	362	120	\$70	\$480	\$250	\$575



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: FACILITY: Wayne Township Wayne Public Library				FACILITY SQ. FT. 37,554			DATE OF AUDIT: 4/1/2014		
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SPACE DESCRIPTION										REPLACEMENT FIXTURES									ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							3458					500				2958								\$0.144			
35	Library	Director	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	3,458	1,192	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,958	830	710	26	105	500	362	120	\$70	\$480	\$250	\$575
36	Library	Assistant Director	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	3,458	1,192	Retrofit fixture with (3) LED Tubes	4	60	500	Ceiling	1	240	2,958	830	710	26	105	500	362	120	\$70	\$480	\$250	\$575
37	Library	Janitors Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	62	124	500	62	Retrofit fixture with (2) LED Tubes	2	40	0			80	500	40	40	22	44	0	22	0	\$3	\$180	\$0	\$140
38	Library	Men's Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	2	62	124	3,458	429	Retrofit fixture with (2) LED U-Tubes	2	52	0			104	3,458	360	360	10	20	0	69	0	\$10	\$180	\$0	\$140
39	Library	Men's Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	3,458	214	Retrofit fixture with (2) LED Tubes	1	40	0			40	3,458	138	138	22	22	0	76	0	\$11	\$90	\$0	\$70
40	Library	Women's Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 U-Lamps & (1) Electronic Ballast	2	62	124	3,458	429	Retrofit fixture with (2) LED U-Tubes	2	52	0			104	3,458	360	360	10	20	0	69	0	\$10	\$180	\$0	\$140
41	Library	Women's Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	3,458	214	Retrofit fixture with (2) LED Tubes	1	40	0			40	3,458	138	138	22	22	0	76	0	\$11	\$90	\$0	\$70
42	Library	Staff Room	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	107	534	3,458	1,845	Retrofit fixture with (4) LED Tubes	5	80	500	Ceiling	1	400	2,958	1,383	1,183	27	134	500	462	200	\$96	\$750	\$250	\$765
43	Library	Children's Reading Room	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	3,458	3,321	Retrofit fixture with (4) LED Tubes	9	80	500	Ceiling	1	720	2,958	2,490	2,130	27	240	500	831	360	\$172	\$1,350	\$250	\$1,205
44	Library	Children's Reading Room	Recessed round fixture, No lens w/ (1) 26W Compact Fluorescent Lamp (CFL)	3	26	78	3,458	270	None	3	26	500	Ceiling	1	78	2,958	270	231	0	0	500	0	39	\$6	\$0	\$250	\$215
45	Library	Children's Area	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	45	107	4,802	3,458	16,604	Retrofit fixture with (4) LED Tubes	45	80	500	Ceiling	2	3,600	2,958	12,449	10,649	27	1,202	500	4,155	1,800	\$860	\$6,750	\$500	\$5,380
46	Library	Children's Area	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	37	107	3,948	3,458	13,652	Retrofit fixture with (4) LED Tubes	37	80	500	Ceiling	1	2,960	2,958	10,236	8,756	27	988	500	3,416	1,480	\$707	\$5,550	\$250	\$4,285
47	Library	Corridor by Main Circ	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	5,000	862	Retrofit fixture with (3) LED Tubes	2	60	0			120	5,000	600	600	26	52	0	262	0	\$38	\$240	\$0	\$180
48	Library	Restroom	4' Vanity fixture with acrylic lens, w/ (1) F32T8/32W Lamp & (1) Electronic Ballast	1	33	33	500	17	Retrofit fixture with (1) LED Tube	1	20	0			20	500	10	10	13	13	0	7	0	\$1	\$60	\$0	\$50
49	Library	Main Circulation	Pendant LED Fixtures 160W	18	160	2,880	3,458	9,959	None	18	160	500	Ceiling	1	2,880	2,958	9,959	8,519	0	0	500	0	1,440	\$208	\$0	\$250	\$215
50	Library	Main Circulation	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pendant, Direct/Indirect Lens	189	62	11,718	3,458	40,521	Retrofit fixture with (2) LED Tubes	189	40	500	Ceiling	5	7,560	2,958	26,142	22,362	22	4,158	500	14,378	3,780	\$2,622	\$17,010	\$1,250	\$14,305
51	Library	Circulation Lobby	Recessed round fixture, No lens w/ (1) 26W Compact Fluorescent Lamp (CFL)	27	26	702	3,458	2,428	None	27	26	500	Ceiling	1	702	2,958	2,428	2,077	0	0	500	0	351	\$51	\$0	\$250	\$215
52	Library	Vestibule/Main Circulation	Recessed round fixture, No lens w/ (1) 26W Compact Fluorescent Lamp (CFL)	2	26	52	3,458	180	None	2	26	0			52	3,458	180	180	0	0	0	0	0	\$0	\$0	\$0	\$0
53	Library	Fire Alarm Panel	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	62	62	500	31	Retrofit fixture with (2) LED Tubes	1	40	0			40	500	20	20	22	22	0	11	0	\$2	\$90	\$0	\$70
54	Library	Friends Room	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	3,458	3,577	Retrofit fixture with (3) LED Tubes	12	60	500	Ceiling	1	720	2,958	2,490	2,130	26	314	500	1,087	360	\$209	\$1,440	\$250	\$1,295
55	Library	SE Meeting Room	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	18	107	1,921	3,458	6,641	Retrofit fixture with (4) LED Tubes	18	80	500	Ceiling	1	1,440	2,958	4,980	4,260	27	481	500	1,662	720	\$344	\$2,700	\$250	\$2,195
56	Library	Men's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	500	129	Retrofit fixture with (3) LED Tubes	3	60	500	Ceiling	1	180	0	90	0	26	78	500	39	90	\$19	\$360	\$250	\$485
57	Library	Women's Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	500	129	Retrofit fixture with (3) LED Tubes	3	60	500	Ceiling	1	180	0	90	0	26	78	500	39	90	\$19	\$360	\$250	\$485
58	Library	Main Circulation Office	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	16	86	1,379	3,458	4,769	Retrofit fixture with (3) LED Tubes	16	60	500	Ceiling	1	960	2,958	3,320	2,840	26	419	500	1,450	480	\$279	\$1,920	\$250	\$1,655
59	Library	Main Circulation Storage	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Retrofit fixture with (3) LED Tubes	1	60	0			60	500	30	30	26	26	0	13	0	\$2	\$120	\$0	\$90
60	Library	Main Circ Old Supervisor/Storage	2'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	500	86	Retrofit fixture with (3) LED Tubes	2	60	0			120	500	60	60	26	52	0	26	0	\$4	\$240	\$0	\$180
61	Library	Computer Room	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	3,458	2,214	Retrofit fixture with (4) LED Tubes	6	80	500	Ceiling	1	480	2,958	1,660	1,420	27	160	500	554	240	\$115	\$900	\$250	\$875
63	Exterior	Pole Lights by Front Parking Lot	Wall Mounted-100W Incandescent	8	100	800	3,458	2,766	20 Watt LED Lamp	8	20	0			160	3,458	553	553	80	640	0	2,213	0	\$320	\$320	\$0	\$240
64	Exterior	Library Garage Exterior	Exterior Light 1,000 W Metal Halide	1	1,100	1,100	3,458	3,804	400 Watt LED Wall Mount	1	400	0			400	3,458	1,383	1,383	700	700	0	2,421	0	\$350	\$2,000	\$0	\$1,825
65	Exterior	Exterior - Library	Exterior Light - 250 W Metal Halide Wall Pack in Shoebox	2	285	570	3,458	1,971	New 120W LED Fixture	2	120	0			240	3,458	830	830	165	330	0	1,141	0	\$165	\$1,500	\$0	\$1,300
66	Exterior	Exterior - Library	Exterior Light 1,000 W Metal Halide	3	1,100	3,300	3,458	11,411	400 Watt LED Wall Mount	3	400	0			1,200	3,458	4,150	4,150	700	2,100	0	7,262	0	\$1,049	\$6,000	\$0	\$5,475
67	Exterior	Exterior - Library	150 W Metal Halide Wall Pack in Shoebox	4	185	740	3,458	2,559	45 Watt LED Wall Mount	4	45	0			180	3,458	622	622	140	560	0	1,936	0	\$280	\$1,600	\$0	\$1,200
				812		67,562		230,087		812				48	45,610		156,028	135,294				74,059	20,734	\$13,687	\$93,104	\$12,000	\$82,244



LIGHTING RETROFIT SUMMARY FOR:
Alps Road Water Pump Station
1163 Alps Road, Wayne, NJ 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Alps Road Water Pump Station	2,200	24	1,444	722	0.66	24	902	451	0.41	542	271	0	271	\$38	\$0	\$38	0.1	\$440	\$0	\$2,004	\$0	\$2,004	40.7

22%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
62%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
0.2%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
0.1%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER: FACILITY: Wayne Township Alps Road Water Pump Station	FACILITY SQ. FT. 2,200	DATE OF AUDIT: 5/16/2014
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SPACE DESCRIPTION			REPLACEMENT FIXTURES																ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							500					500				500								\$0.142			
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
1	Main	Main Area	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	20	62	1,240	500	620	Retrofit fixture with (2) LED Tubes	20	40				800	500	400	400	22	440	0	220	0	\$31	\$1,800	\$0	\$1,400
2	Main	Storage Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	90	180	500	90	Retrofit fixture with (2) LED Tubes	2	40				80	500	40	40	50	100	0	50	0	\$7	\$180	\$0	\$140
3	Exterior	Exterior	60W Incandescent	2	12	24	500	12	11W LED Lamp	2	11				22	500	11	11	1	2	0	1	0	\$0	\$24	\$0	\$24
				24		1,444		722		24				0	902		451	451				271	0	\$38	\$2,004	\$0	\$1,564



LIGHTING RETROFIT SUMMARY FOR:
Jacobus Pump Station
40 Jacobus Ave. Wayne, NJ 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Jacobus Pump Station	2,200	1	144	72	0.07	1	80	40	0.04	64	32	0	32	\$4	\$0	\$4	0.0	\$40	\$0	\$150	\$0	\$150	26.3

27%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
56%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
0.0%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
0.0%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER:	Wayne Township	FACILITY SQ. FT. 2,200	DATE OF AUDIT: 5/16/2014
	FACILITY:	Jacobus Pump Station		

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							500					500				500								\$0.131			
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
1	Main Area	Main Area	2'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	500	72	Retrofit fixture with (4) LED Tubes	1	80				80	500	40	40	64	64	0	32	0	\$4	\$150	\$0	\$110
				1		144		72		1				0	80		40	40				32	0	\$4	\$150	\$0	\$110



LIGHTING RETROFIT SUMMARY FOR:
Lower Preakness Sewer Pump Station
180 Dey Road, Wayne, NJ 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Lower Preakness Sewer Pump Station	2,200	29	2,439	1,220	1.11	29	1,102	551	0.50	1,337	669	0	669	\$107	\$0	\$107	0.2	\$540	\$0	\$2,454	\$0	\$2,454	17.9

22%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
45%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
0.3%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
0.1%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT
LINE x LINE DETAIL

CUSTOMER: Wayne Township
FACILITY: Lower Preakness Sewer Pump Station

FACILITY SQ. FT.
2,200

DATE OF AUDIT:
5/16/2014

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
1	2	3	4	5	6	7	500	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
1	Main Area	Main Area	4' Pendant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	1	75	75	500	38	Retrofit fixture with (2) LED Tubes	1	40				40	500	20	20	35	35	0	18	0	\$3	\$90	\$0	\$70
2	Main Area	Main Area	4' Pendant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	2	90	180	500	90	Retrofit fixture with (2) LED Tubes	2	40				80	500	40	40	50	100	0	50	0	\$8	\$180	\$0	\$140
3	Lower Level	Lower Level	4' Pendant Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	20	90	1,800	500	900	Retrofit fixture with (2) LED Tubes	20	40				800	500	400	400	50	1,000	0	500	0	\$80	\$1,800	\$0	\$1,400
4	Lower Level	Lower Level	4' Pendant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	4	90	360	500	180	Retrofit fixture with (2) LED Tubes	4	40				160	500	80	80	50	200	0	100	0	\$16	\$360	\$0	\$280
5	Exterior	Exterior	60W Incandescent	2	12	24	500	12	11W LED Lamp	2	11				22	500	11	11	1	2	0	1	0	\$0	\$24	\$0	\$24
				29		2,439		1,220		29				0	1,102		551	551				669	0	\$107	\$2,454	\$0	\$1,914



LIGHTING RETROFIT SUMMARY FOR:
Sheffield Sewer Pump Station
14 Farmingdale Road, Wayne, NJ 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Sheffield Sewer Pump Station	2,000	24	1,260	630	0.63	24	370	185	0.19	890	445	0	445	\$58	\$0	\$58	0.1	\$140	\$0	\$1,500	\$0	\$1,500	23.5

9%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
29%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
0.2%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
0.1%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: Wayne Township FACILITY: Sheffield Sewer Pump Station			FACILITY SQ. FT. 2,000		DATE OF AUDIT: 5/16/2014	
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SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS			
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL REBATE / LINE	TOTAL INSTALLED COST AFTER INCENTIVES
							2500					500				500								\$0.130				
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	Main Area	Main Area	Exit Sign - 20W Incandescent	8	20	160	500	80	5W LED Exit Sign	8	5				40	500	20	20	15	120	0	60	0	\$8	\$400	\$0	\$0	\$400
2	Main Area	Main Area	4' Pendant Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	1	90	90	500	45	Retrofit fixture with (2) LED Tubes	1	40				40	500	20	20	50	50	0	25	0	\$3	\$90	\$0	\$20	\$70
3	Lower Level	Lower Level	Exit Sign - 20W Incandescent	7	50	350	500	175	5W LED Exit Sign	7	5				35	500	18	18	45	315	0	158	0	\$21	\$350	\$0	\$0	\$350
4	Lower Level	Generator Room	4' Pendant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	4	90	360	500	180	Retrofit fixture with (2) LED Tubes	4	40				160	500	80	80	50	200	0	100	0	\$13	\$360	\$0	\$80	\$280
5	Lower Level	Generator Room	2'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	150	150	500	75	Retrofit fixture with (4) LED Tubes	1	80				80	500	40	40	70	70	0	35	0	\$5	\$150	\$0	\$40	\$110
6	Exterior	Exterior	Exit Sign - 20W Incandescent	3	50	150	500	75	5W LED Exit Sign	3	5				15	500	8	8	45	135	0	68	0	\$9	\$150	\$0	\$0	\$150
				24		1,260		630		24				0	370		185	185				445	0	\$58	\$1,500	\$0		\$1,360



LIGHTING RETROFIT SUMMARY FOR:
Wanaque Water Pump Station
529 Newark Pompton Tpke, Wayne, NJ 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Wanaque Water Pump Station	800	6	324	162	0.41	6	182	91	0.23	142	71	0	71	\$8	\$0	\$8	0.0	\$80	\$0	\$384	\$0	\$384	36.3

21%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
56%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
0.0%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
0.0%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER:	Wayne Township	FACILITY SQ. FT. 800	DATE OF AUDIT: 5/16/2014
	FACILITY:	Wanaque Water Pump Station		

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							500					500				500								\$0.118			
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
1	Main Area	Main Area	Surface Mount Strip, Prismatic Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving	4	75	300	500	150	Retrofit fixture with (2) LED Tubes	4	40				160	500	80	80	35	140	0	70	0	\$8	\$360	\$0	\$280
2	Exterior	Exterior	60W Incandescent	2	12	24	500	12	11W LED Lamp	2	11				22	500	11	11	1	2	0	1	0	\$0	\$24	\$0	\$24
				6		324		162		6				0	182		91	91				71	0	\$8	\$384	\$0	\$304



LIGHTING RETROFIT SUMMARY FOR:
West Belt Water Pump Station
70 West Belt Wayne, New Jersey 07470

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIXTURES NJ Smart Start REBATE \$	SENSORS NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
West Belt Water Pump Station	3,000	38	3,753	1,877	1.25	38	2,043	1,022	0.68	1,710	855	0	855	\$111	\$0	\$111	0.3	\$950	\$0	\$3,756	\$0	\$3,756	25.2

25%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
54%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
0.1%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
0.0%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER:	Wayne Township	FACILITY SQ. FT.	DATE OF AUDIT:
	FACILITY:	West Belt Water Pump Station	3,000	5/16/2014

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							500					500				500								\$0.130			
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
1	Main Area	Main Area	4' Pendant Fixture, No Lens, w/ (3) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	1	117	117	500	59	Retrofit fixture with (3) LED Tubes	1	60				60	500	30	30	57	57	0	29	0	\$4	\$120	\$0	\$90
2	VFD Room	VFD Room	4' Pendant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	2	90	180	500	90	Retrofit fixture with (2) LED Tubes	2	40				80	500	40	40	50	100	0	50	0	\$7	\$180	\$0	\$140
3	Shop	Shop	2'x4' Pendant Fixture, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	20	150	3,000	500	1,500	Retrofit fixture with (4) LED Tubes	20	80				1,600	500	800	800	70	1,400	0	700	0	\$91	\$3,000	\$0	\$2,200
4	Bahtroom	Bahtroom	60W Incandescent	4	12	48	500	24	11W LED Lamp	4	11				44	500	22	22	1	4	0	2	0	\$0	\$48	\$0	\$48
5	Control Room	Control Room	2'x4' Pendant Fixture, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	2	150	300	500	150	Retrofit fixture with (4) LED Tubes	2	80				160	500	80	80	70	140	0	70	0	\$9	\$300	\$0	\$220
6	Exterior	Exterior	60W Incandescent	9	12	108	500	54	11W LED Lamp	9	11				99	500	50	50	1	9	0	5	0	\$1	\$108	\$0	\$108
				38		3,753		1,877		38				0	2,043		1,022	1,022				855	0	\$111	\$3,756	\$0	\$2,806



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #4:

AC UNIT UPGRADES

Rooftop AC Unit Replacement - Energy Savings Calculations

Index	Tag#	Location	Qty	Area Serving	Existing System							Proposed System			Multiple Unit Labor Discount	Equipment Cost	Labor Cost	Total Cost	Total Rebate	Electric Savings, kWh	Demand Savings, kW	Gas Savings, Therms
					Cooling Capacity (tons)	Existing EER	Existing SEER / IEER	Heating Source	Heating Capacity input - MBH	Heating Efficiency	Outside Air Economizer	Cooling EER	Cooling IEER	Heating Efficiency								
1	Police Desk	Municipal Building Rooftop	1	Weapon Cleaning Room	10	9	11.3	Natural Gas	180	75%	Yes	13.5	20.8	82%	100%	\$1,120	\$600	\$17,200	\$730	3647	4.4	365
2	Police Department	Municipal Building Rooftop	1	Police Hall and Offices	18	8.9	11.1	Natural Gas	275	75%	Yes	12.5	19.1	82%	100%	\$983	\$486	\$26,434	\$1,422	6420	7.0	558
3	Evidence Room	Municipal Building Rooftop	1	Evidence Room	5	8.5	10.6	0	0	0%	No	12	17.5	0%	100%	\$1,020	\$1,000	\$10,100	\$460	3646	2.1	0
4	AC-8	Municipal Building Rooftop	1	NE Hallways	10	8.5	10.6	0	0	0%	No	13.5	20.8	0%	100%	\$1,120	\$600	\$17,200	\$730	9146	5.2	0
5	AC-6	Municipal Building Rooftop	1	Engineering Department	10	8.5	10.6	0	0	0%	No	13.5	20.8	0%	100%	\$1,120	\$600	\$17,200	\$730	7723	5.2	0
6	AC-7	Municipal Building Rooftop	1	Planning Department	7.5	8.5	10.6	0	0	0%	No	13.5	20.8	0%	100%	\$1,047	\$667	\$12,850	\$548	6860	3.9	0
7	AC-9	Municipal Building Rooftop	1	Taxation	5	9	11.3	0	0	0%	No	12	17.5	0%	100%	\$1,020	\$1,000	\$10,100	\$460	3590	1.7	0
8	AC-5	Municipal Building Rooftop	1	Treasury	8.5	8.5	10.6	0	0	0%	No	13.5	20.8	0%	100%	\$1,000	\$647	\$14,000	\$621	7774	4.4	0
9	CU-3&4	Municipal Building Rooftop	2	Health Department	3	9	11.3	0	0	0%	No	12	17.5	0%	75%	\$1,242	\$1,000	\$13,450	\$552	4308	2.0	0
10	CU-1 & 2	Municipal Building Rooftop	2	Health Department	3	9	11.3	0	0	0%	No	12	17.5	0%	75%	\$1,242	\$1,000	\$13,450	\$552	4308	2.0	0
11	Ductless Split	Municipal Building Rooftop	1	Health Department	3	11	13.8	0	0	0%	No	12	17.5	0%	100%	\$1,242	\$1,333	\$7,725	\$276	1375	0.3	0
12	Split AC	Mountain View Service Bldg	1	Offices	30	7	8.8	0	0	0%	No	10.1	13	0%	100%	\$923	\$333	\$37,700	\$1,200	26408	15.8	0

Equipment Basis for Design:

3-25 Ton Units: Carrier WeatherExpert or Equivalent
30-75 Ton Units: Carrier WeatherMaker or Equivalent
80-150 Ton Units: Carrier WeatherExpert or Equivalent

				Total Cost	Total Rebate	Electric Savings, kWh	Demand Savings, kW	Gas Savings, Therms
Municipal Building				\$151,984	\$6,804	57422	37.98	924
Mountain View Service Building				\$37,700	\$1,200	26408	15.79	0
Total				\$189,684	\$8,004	83830	53.77	924

AC Unit Replacement

Municipal Building Rooftop - Weapon Cleaning Room

Total Cooling Capacity	10	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	180	Unoccupied Load	88%	of design
Economizer	Yes	(3% per degree)		
Estimated Cooling Load	80%	of total capacity		
Estimated Heating Load	100%	of total capacity		

Indoor Temp Cooling (db)	75				Total Cooling Load (Tons)	8.0		Existing IEER (Est)=	11.3	New IEER=	20.8
Indoor Temp Heating (db)	70	Indoor Temp (wb)		63	Heating Capacity (MBH)	180.0		Existing AFUE=	75%	New AFUE=	82%

COOLING ENERGY SAVINGS

Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
<i>Cooling</i>															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	8.0	3.2	8	11.3	20.8	8.53	4.62	3.92
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	8.0	3.2	168	11.3	20.8	179.20	96.92	82.28
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	8.0	4.0	368	11.3	20.8	392.53	212.31	180.23
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	6.9	3.4	1,183	11.3	20.8	1,261.71	682.42	579.30
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	5.7	2.9	2,246	11.3	20.8	2,395.43	1,295.60	1,099.82
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	4.6	2.3	2,880	11.3	15.0	3,072.00	2,304.00	768.00
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	3.4	1.7	1,872	11.3	15.0	1,996.80	1,497.60	499.20
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	2.3	1.1	1,627	11.3	15.0	1,735.92	1,301.94	433.98
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	2.3	1.1	1,495	11.3	15.0	0.00		0.00
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	2.3	1.1	1,539	11.3	15.0	0.00		0.00
4,544													11,042	7,395	3,647

HEATING ENERGY SAVINGS

Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Heating MBH	Unoccupied Heating MBH	Therms/Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	New Unit Therms	Energy Savings Therms
50-55	52.5	46.3	36.51	62.51%	237.0	516.0	753	20	18	145	75%	82%	193.22	176.72	16.49
45-50	47.5	41.5	28.95	59.88%	136.0	334.0	470	40	35	181	75%	82%	241.96	221.31	20.66
40-45	42.5	38.0	26.44	66.11%	196.0	452.0	648	60	53	375	75%	82%	499.58	456.94	42.65
35-40	37.5	33.9	22.77	69.31%	203.0	532.0	735	80	70	569	75%	82%	758.02	693.31	64.71
30-35	32.5	29.3	18.58	68.99%	213.0	436.0	649	100	88	623	75%	82%	831.25	760.29	70.96
25-30	27.5	24.6			123.0	226.0	349	120	106	401	75%	82%	534.78	489.13	45.65
20-25	22.5	19.4			65.0	249.0	314	140	123	429	75%	82%	571.57	522.78	48.79
15-20	17.5	15.4			45.0	136.0	181	160	141	281	75%	82%	374.61	342.63	31.98
10-15	12.5	9.8			11.0	65.0	76	180	158	134	75%	82%	179.23	163.93	15.30
5-10	7.5	4.1			6.0	25.0	31	180	158	55	75%	82%	72.67	66.47	6.20
0-5	2.5	1.3			2.0	4.0	6	180	158	10	75%	82%	13.82	12.64	1.18
-5-0	-2.5	0.0			2.0	2.0	4	180	158	7	75%	82%	9.02	8.25	0.77
1,440													4,280	3,914	365
													Therms	Therms	Therms

AC Unit Replacement

Municipal Building Rooftop - Police Hall and Offices

Total Cooling Capacity	18	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	275	Unoccupied Load	88%	of design
Economizer	Yes	(3% per degree)		
Estimated Cooling Load	80%	of total capacity		
Estimated Heating Load	100%	of total capacity		

				At design conditions			
				Existing EER=	8.9	New EER=	12.5
				Existing IEER (Est)=	11.1	New IEER=	19.1
				Existing AFUE=	75%	New AFUE=	82%

Indoor Temp Cooling (db)	75		
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63

COOLING ENERGY SAVINGS

Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
<i>Cooling</i>															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	14.4	5.8	14	11.1	19.1	15.53	9.05	6.49
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	14.4	5.8	302	11.1	19.1	326.18	189.99	136.19
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	14.4	7.2	662	11.1	19.1	714.50	416.17	298.33
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	12.3	6.2	2,129	11.1	19.1	2,296.60	1,337.68	958.92
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	10.3	5.1	4,042	11.1	19.1	4,360.22	2,539.66	1,820.56
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	8.2	4.1	5,184	11.1	15.0	5,591.73	4,147.20	1,444.53
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	6.2	3.1	3,370	11.1	15.0	3,634.62	2,695.68	938.94
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	4.1	2.1	2,929	11.1	15.0	3,159.77	2,343.50	816.27
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	4.1	2.1	2,691	11.1	15.0	0.00		0.00
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	4.1	2.1	2,771	11.1	15.0	0.00		0.00
4,544													20,099	13,679	6,420

HEATING ENERGY SAVINGS

Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Heating MBH	Unoccupied Heating MBH	Therms/Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	New Unit Therms	Energy Savings Therms
50-55	52.5	46.3	36.51	62.51%	237.0	516.0	753	31	27	221	75%	82%	295.19	269.99	25.20
45-50	47.5	41.5	28.95	59.88%	136.0	334.0	470	61	54	277	75%	82%	369.67	338.11	31.56
40-45	42.5	38.0	26.44	66.11%	196.0	452.0	648	92	81	572	75%	82%	763.25	698.10	65.16
35-40	37.5	33.9	22.77	69.31%	203.0	532.0	735	122	108	869	75%	82%	1,158.08	1,059.22	98.86
30-35	32.5	29.3	18.58	68.99%	213.0	436.0	649	153	134	952	75%	82%	1,269.97	1,161.56	108.41
25-30	27.5	24.6			123.0	226.0	349	183	161	613	75%	82%	817.03	747.28	69.75
20-25	22.5	19.4			65.0	249.0	314	214	188	655	75%	82%	873.24	798.69	74.54
15-20	17.5	15.4			45.0	136.0	181	244	215	429	75%	82%	572.33	523.47	48.86
10-15	12.5	9.8			11.0	65.0	76	275	242	205	75%	82%	273.83	250.45	23.38
5-10	7.5	4.1			6.0	25.0	31	275	242	83	75%	82%	111.03	101.55	9.48
0-5	2.5	1.3			2.0	4.0	6	275	242	16	75%	82%	21.12	19.32	1.80
-5-0	-2.5	0.0			2.0	2.0	4	275	242	10	75%	82%	13.79	12.61	1.18
2,200													6,539	5,980	558
													Therms	Therms	Therms

AC Unit Replacement

Municipal Building Rooftop - Evidence Room

Total Cooling Capacity	5	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	0	Unoccupied Load	88%	of design
Economizer	No	(3% per degree)		
Estimated Cooling Load	80%	of total capacity		
Estimated Heating Load	100%	of total capacity		

				At design conditions			
				Existing EER=	8.5	New EER=	12.0
Indoor Temp Cooling (db)	75			Existing IEER (Est)=	10.6	New IEER=	17.5
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63	Existing AFUE=	0%	New AFUE=	0%
				Total Cooling Load (Tons)	4.0		
				Heating Capacity (MBH)	0.0		

COOLING ENERGY SAVINGS															
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
<i>Cooling</i>															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	4.0	1.6	4	10.6	17.5	4.52	2.74	1.77
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	4.0	1.6	84	10.6	17.5	94.87	57.60	37.27
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	4.0	2.0	184	10.6	17.5	207.81	126.17	81.64
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	3.4	1.7	591	10.6	17.5	667.97	405.55	262.42
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	2.9	1.4	1,123	10.6	17.5	1,268.17	769.96	498.21
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	2.3	1.1	1,440	10.6	15.0	1,626.35	1,152.00	474.35
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	1.7	0.9	936	10.6	15.0	1,057.13	748.80	308.33
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	1.1	0.6	814	10.6	15.0	919.02	650.97	268.05
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	1.1	0.6	747	10.6	15.0	844.15		844.15
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	1.1	0.6	770	10.6	15.0	869.32		869.32
4,544													7,559	3,914	3,646

AC Unit Replacement

Municipal Building Rooftop - NE Hallways

Total Cooling Capacity	10	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	0	Unoccupied Load	88%	of design
Economizer	No	(3% per degree)		
Estimated Cooling Load	80%	of total capacity		
Estimated Heating Load	100%	of total capacity		

				At design conditions			
				Existing EER=	8.5	New EER=	13.5
				Existing IEER (Est)=	10.6	New IEER=	20.8
				Existing AFUE=	0%	New AFUE=	0%

Indoor Temp Cooling (db)	75		
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63

COOLING ENERGY SAVINGS

Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
<i>Cooling</i>															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	8.0	3.2	8	10.6	20.8	9.04	4.62	4.42
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	8.0	3.2	168	10.6	20.8	189.74	96.92	92.82
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	8.0	4.0	368	10.6	20.8	415.62	212.31	203.32
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	6.9	3.4	1,183	10.6	20.8	1,335.93	682.42	653.52
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	5.7	2.9	2,246	10.6	20.8	2,536.34	1,295.60	1,240.73
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	4.6	2.3	2,880	10.6	20.8	3,252.71	1,661.54	1,591.17
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	3.4	1.7	1,872	10.6	20.8	2,114.26	1,080.00	1,034.26
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	2.3	1.1	1,627	10.6	20.8	1,838.04	938.90	899.14
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	2.3	1.1	1,495	10.6	20.8	1,688.31		1,688.31
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	2.3	1.1	1,539	10.6	20.8	1,738.65		1,738.65
4,544													15,119	5,972	9,146

AC Unit Replacement

Municipal Building Rooftop - Engineering Department

Total Cooling Capacity	10	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	0	Unoccupied Load	88%	of design
Economizer	No	(3% per degree)		
Estimated Cooling Load	80%	of total capacity		
Estimated Heating Load	25%	of total capacity		

				At design conditions			
				Existing EER=	8.5	New EER=	13.5
				Existing IEER (Est)=	10.6	New IEER=	20.8
				Existing AFUE=	0%	New AFUE=	0%

Indoor Temp Cooling (db)	75		
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63

COOLING ENERGY SAVINGS

Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
<i>Cooling</i>															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	8.0	3.2	8	10.6	20.8	9.04	4.62	4.42
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	8.0	3.2	168	10.6	20.8	189.74	96.92	92.82
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	8.0	4.0	368	10.6	20.8	415.62	212.31	203.32
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	6.9	3.4	1,183	10.6	20.8	1,335.93	682.42	653.52
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	5.7	2.9	2,246	10.6	20.8	2,536.34	1,295.60	1,240.73
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	4.6	2.3	2,880	10.6	15.0	3,252.71	2,304.00	948.71
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	3.4	1.7	1,872	10.6	15.0	2,114.26	1,497.60	616.66
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	2.3	1.1	1,627	10.6	15.0	1,838.04	1,301.94	536.09
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	2.3	1.1	1,495	10.6	15.0	1,688.31		1,688.31
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	2.3	1.1	1,539	10.6	15.0	1,738.65		1,738.65
4,544													15,119	7,395	7,723

AC Unit Replacement Municipal Building Rooftop - Planning Department

Total Cooling Capacity	7.5	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	0	Unoccupied Load	88%	of design
Economizer	No	(3% per degree)		
Estimated Cooling Load	80%	of total capacity		
Estimated Heating Load	25%	of total capacity		

					At design conditions				
					Existing EER=	8.5	New EER=	13.5	
Indoor Temp Cooling (db)	75				Existing IEER (Est)=	10.6	New IEER=	20.8	
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63		Existing AFUE=	0%	New AFUE=	0%	
					Total Cooling Load (Tons)	6.0			
					Heating Capacity (MBH)	0.0			

COOLING ENERGY SAVINGS															
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
Cooling															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	6.0	2.4	6	10.6	20.8	6.78	3.46	3.31
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	6.0	2.4	126	10.6	20.8	142.31	72.69	69.61
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	6.0	3.0	276	10.6	20.8	311.72	159.23	152.49
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	5.1	2.6	887	10.6	20.8	1,001.95	511.81	490.14
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	4.3	2.1	1,684	10.6	20.8	1,902.25	971.70	930.55
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	3.4	1.7	2,160	10.6	20.8	2,439.53	1,246.15	1,193.38
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	2.6	1.3	1,404	10.6	20.8	1,585.69	810.00	775.69
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	1.7	0.9	1,221	10.6	20.8	1,378.53	704.18	674.35
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	1.7	0.9	1,121	10.6	20.8	1,266.23		1,266.23
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	1.7	0.9	1,155	10.6	20.8	1,303.99		1,303.99
4,544													11,339	4,479	6,860

AC Unit Replacement

Municipal Building Rooftop - Taxation

Total Cooling Capacity	5	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	0	Unoccupied Load	88%	of design
Economizer	No	(3% per degree)		
Estimated Cooling Load	80%	of total capacity		
Estimated Heating Load	25%	of total capacity		

					At design conditions				
					Existing EER=	9.0	New EER=	12.0	
Indoor Temp Cooling (db)	75				Existing IEER (Est)=	11.3	New IEER=	17.5	
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63		Existing AFUE=	0%	New AFUE=	0%	

COOLING ENERGY SAVINGS															
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
Cooling															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	4.0	1.6	4	11.3	17.5	4.27	2.74	1.52
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	4.0	1.6	84	11.3	17.5	89.60	57.60	32.00
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	4.0	2.0	184	11.3	17.5	196.27	126.17	70.10
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	3.4	1.7	591	11.3	17.5	630.86	405.55	225.31
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	2.9	1.4	1,123	11.3	17.5	1,197.71	769.96	427.76
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	2.3	1.1	1,440	11.3	17.5	1,536.00	987.43	548.57
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	1.7	0.9	936	11.3	17.5	998.40	641.83	356.57
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	1.1	0.6	814	11.3	17.5	867.96	557.98	309.99
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	1.1	0.6	747	11.3	17.5	797.26		797.26
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	1.1	0.6	770	11.3	17.5	821.03		821.03
4,544													7,139	3,549	3,590

Municipal Building Rooftop - Treasury

Total Cooling Capacity	8.5	Unoccupied Setback	4	°F (Heating)	
Total Heating Capacity	0	Unoccupied Load	88%	of design	(3% per degree)

Economizer	No	
Estimated Cooling Load	80%	of total capacity
Estimated Heating Load	80%	of total capacity

At design conditions			
Existing EER=	8.5	New EER=	13.5
Existing IEER (Est)=	10.6	New IEER=	20.8
Existing AFUE=	0%	New AFUE=	0%

Indoor Temp Cooling (db)	75		
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63

Total Cooling Load (Tons)	6.8
Heating Capacity (MBH)	0.0

COOLING ENERGY SAVINGS

Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
<i>Cooling</i>															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	6.8	2.7	7	10.6	20.8	7.68	3.92	3.76
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	6.8	2.7	143	10.6	20.8	161.28	82.38	78.90
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	6.8	3.4	313	10.6	20.8	353.28	180.46	172.82
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	5.8	2.9	1,005	10.6	20.8	1,135.54	580.05	555.49
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	4.9	2.4	1,909	10.6	20.8	2,155.89	1,101.26	1,054.62
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	3.9	1.9	2,448	10.6	20.8	2,764.80	1,412.31	1,352.49
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	2.9	1.5	1,591	10.6	20.8	1,797.12	918.00	879.12
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	1.9	1.0	1,383	10.6	20.8	1,562.33	798.07	764.27
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	1.9	1.0	1,271	10.6	20.8	1,435.06		1,435.06
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	1.9	1.0	1,309	10.6	20.8	1,477.85		1,477.85
4,544												12,851		5,076	7,774

AC Unit Replacement Municipal Building Rooftop - Health Department

Total Cooling Capacity	3	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	0	Unoccupied Load	88%	of design

(3% per degree)

Economizer	No
Estimated Cooling Load	80%
Estimated Heating Load	80%

of total capacity

of total capacity

At design conditions			
Existing EER=	9.0	New EER=	12.0
Existing IEER (Est)=	11.3	New IEER=	17.5
Existing AFUE=	0%	New AFUE=	0%

Indoor Temp Cooling (db)	75		
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63

Total Cooling Load (Tons)	2.4
Heating Capacity (MBH)	0.0

COOLING ENERGY SAVINGS															
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
Cooling															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	2.4	1.0	2	11.3	17.5	2.56	1.65	0.91
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	2.4	1.0	50	11.3	17.5	53.76	34.56	19.20
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	2.4	1.2	110	11.3	17.5	117.76	75.70	42.06
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	2.1	1.0	355	11.3	17.5	378.51	243.33	135.18
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	1.7	0.9	674	11.3	17.5	718.63	461.98	256.65
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	1.4	0.7	864	11.3	17.5	921.60	592.46	329.14
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	1.0	0.5	562	11.3	17.5	599.04	385.10	213.94
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	0.7	0.3	488	11.3	17.5	520.78	334.79	185.99
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	0.7	0.3	448	11.3	17.5	478.35		478.35
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	0.7	0.3	462	11.3	17.5	492.62		492.62
4,544													4,284	2,130	2,154

AC Unit Replacement Municipal Building Rooftop - Health Department

Total Cooling Capacity	3	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	0	Unoccupied Load	88%	of design

(3% per degree)

Economizer	No
Estimated Cooling Load	80%
Estimated Heating Load	80%

of total capacity

of total capacity

At design conditions			
Existing EER=	9.0	New EER=	12.0
Existing IEER (Est)=	11.3	New IEER=	17.5
Existing AFUE=	0%	New AFUE=	0%

Indoor Temp Cooling (db)	75		
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63

Total Cooling Load (Tons)	2.4
Heating Capacity (MBH)	0.0

COOLING ENERGY SAVINGS															
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
Cooling															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	2.4	1.0	2	11.3	17.5	2.56	1.65	0.91
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	2.4	1.0	50	11.3	17.5	53.76	34.56	19.20
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	2.4	1.2	110	11.3	17.5	117.76	75.70	42.06
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	2.1	1.0	355	11.3	17.5	378.51	243.33	135.18
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	1.7	0.9	674	11.3	17.5	718.63	461.98	256.65
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	1.4	0.7	864	11.3	17.5	921.60	592.46	329.14
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	1.0	0.5	562	11.3	17.5	599.04	385.10	213.94
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	0.7	0.3	488	11.3	17.5	520.78	334.79	185.99
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	0.7	0.3	448	11.3	17.5	478.35		478.35
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	0.7	0.3	462	11.3	17.5	492.62		492.62
4,544													4,284	2,130	2,154

AC Unit Replacement Municipal Building Rooftop - Health Department

Total Cooling Capacity	3	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	0	Unoccupied Load	88%	of design

(3% per degree)

Economizer	No
Estimated Cooling Load	80%
Estimated Heating Load	80%

of total capacity

of total capacity

					At design conditions			
					Existing EER=	11.0	New EER=	12.0
Indoor Temp Cooling (db)	75				Existing IEER (Est)=	13.8	New IEER=	17.5
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63		Existing AFUE=	0%	New AFUE=	0%
					Total Cooling Load (Tons)	2.4		
					Heating Capacity (MBH)	0.0		

COOLING ENERGY SAVINGS															
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
Cooling															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	2.4	1.0	2	13.8	17.5	2.09	1.65	0.45
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	2.4	1.0	50	13.8	17.5	43.99	34.56	9.43
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	2.4	1.2	110	13.8	17.5	96.35	75.70	20.65
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	2.1	1.0	355	13.8	17.5	309.69	243.33	66.36
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	1.7	0.9	674	13.8	17.5	587.97	461.98	125.99
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	1.4	0.7	864	13.8	17.5	754.04	592.46	161.58
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	1.0	0.5	562	13.8	17.5	490.12	385.10	105.03
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	0.7	0.3	488	13.8	17.5	426.09	334.79	91.31
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	0.7	0.3	448	13.8	17.5	391.38		391.38
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	0.7	0.3	462	13.8	17.5	403.05		403.05
4,544													3,505	2,130	1,375

AC Unit Replacement Mountain View Service Bldg - Offices

Total Cooling Capacity	30	Unoccupied Setback	4	°F (Heating)
Total Heating Capacity	0	Unoccupied Load	88%	of design
Economizer	No	(3% per degree)		
Estimated Cooling Load	80%	of total capacity		
Estimated Heating Load	80%	of total capacity		

At design conditions			
Existing EER=	7.0	New EER=	10.1
Existing IEER (Est)=	8.8	New IEER=	13.0
Existing AFUE=	0%	New AFUE=	0%

Indoor Temp Cooling (db)	75				Total Cooling Load (Tons)	24.0	
Indoor Temp Heating (db)	70	Indoor Temp (wb)	63		Heating Capacity (MBH)	0.0	

COOLING ENERGY SAVINGS															
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing IEER (Estimated)	Proposed IEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
Cooling															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	24.0	9.6	24	8.8	13.0	32.91	22.15	10.76
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	24.0	9.6	504	8.8	13.0	691.20	465.23	225.97
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	24.0	12.0	1,104	8.8	13.0	1,514.06	1,019.08	494.98
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	20.6	10.3	3,549	8.8	13.0	4,866.61	3,275.60	1,591.01
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	17.1	8.6	6,737	8.8	13.0	9,239.51	6,218.90	3,020.61
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	13.7	6.9	8,640	8.8	13.0	11,849.14	7,975.38	3,873.76
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	10.3	5.1	5,616	8.8	13.0	7,701.94	5,184.00	2,517.94
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	6.9	3.4	4,882	8.8	13.0	6,695.71	4,506.73	2,188.98
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	6.9	3.4	4,485	8.8	13.0	6,150.27		6,150.27
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	6.9	3.4	4,618	8.8	13.0	6,333.65		6,333.65
4,544													55,075	28,667	26,408



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510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #5:

BOILER REPLACEMENT

Boiler Replacement - Wayne Township Building

Natural Gas Heating Capacity at Wayne Township Building		
RTUs	1220 MBH	22%
Weil McLain Boiler	1378 MBH	24%
Boiler	3040 MBH	54%
Total	5638 MBH	

(Existing boiler to remain)

It is assumed that the total gas consumption of the boilers is proportional to equipment capacity.

Therefore, it is estimated that 54% of the natural gas is used at the boiler plant.

Annual natural gas consumption for domestic hot water is estimated based on usage during May and October.

Boiler Replacement Energy Savings Calculations										
Month	Total Natural Gas Therms	Domestic Hot Water, Therms	Net Natural Gas for Heating, Therms	Boiler Consumption, Therms	Total Cost	\$/Therm	Est. Existing Boiler Efcy	Proposed Boiler Efcy	Proposed Natural Gas Therms	Energy Savings, Therms
Mar-13	5,411	0	5,411	2,918	\$2,602	\$0.89	60%	90%	1,945	973
Apr-13	4,384	0	4,384	2,364	\$1,490	\$0.63	60%	90%	1,576	788
May-13	1,235	0	1,235	666	\$512	\$0.77	60%	90%	444	222
Jun-13	25	0	25	13	\$65	-	-	-	-	-
Jul-13	8	0	8	4	\$59	-	-	-	-	-
Aug-13	8	0	8	4	\$59	-	-	-	-	-
Sep-13	9	0	9	5	\$59	-	-	-	-	-
Oct-13	36	0	36	19	\$70	-	-	-	-	-
Nov-13	3,252	0	3,252	1,754	\$1,753	-	-	-	-	-
Dec-13	5,352	0	5,352	2,886	\$2,621	\$0.91	60%	90%	1,924	962
Jan-14	6,596	0	6,596	3,556	\$3,283	\$0.92	60%	90%	2,371	1,185
Feb-14	7,520	0	7,520	4,055	\$4,092	\$1.01	60%	90%	2,703	1,352
	33,836	0	33,836	18,244	\$16,664	\$0.91			10,963	5,482

Existing Conditions and Assumptions

- Existing boiler's estimated efficiency = 60 %
- The boiler is oversized for the current hot water heating load.

Cost Analysis

Modular Boilers (1 x 3000 MBH)	\$50,000
Accessories	\$20,000
Boiler Installation	\$80,000

Proposed Changes

- Replace Pacific Boiler with high efficiency condensing hot water boilers.
- Reconnect existing hot water pipes to new boiler hot water supply

Total	\$150,000
Rebates	\$3,000

Boiler Replacement - Design Basis

Boiler	# of Units	Capacity, MBH	Action	Proposed
Any condensing boiler manufacturer	1	3,000	Replace boiler	1 x 3000 MBH Modular Condensing Hot Water Boiler. A thorough hot water load analysis should be performed by a professional engineer before implementing this ECM.

Boiler Replacement - Public Library

Natural Gas Heating Capacity at Wayne Public Library		
RTUs	2900 MBH	78%
Boiler	800 MBH	22%
Total	3700 MBH	

It is assumed that the total gas consumption of the boilers is proportional to equipment capacity.

Therefore, it is estimated that 22% of the natural gas is used at the boiler plant.

Annual natural gas consumption for domestic hot water is estimated based on usage during May and October.

Boiler Replacement Energy Savings Calculations										
Month	Total Natural Gas Therms	Domestic Hot Water, Therms	Net Natural Gas for Heating, Therms	Boiler Consumption, Therms	Total Cost	\$/Therm	Est. Existing Boiler Efcy	Proposed Boiler Efcy	Proposed Natural Gas Therms	Energy Savings, Therms
Mar-13	4,851	0	4,851	1,049	\$942	\$0.90	75%	90%	874	175
Apr-13	3,605	0	3,605	779	\$497	\$0.64	75%	90%	650	130
May-13	1,019	0	1,019	220	\$175	\$0.79	75%	90%	184	37
Jun-13	214	0	214	46	\$54	-	-	-	-	-
Jul-13	0	0	0	0	\$0	-	-	-	-	-
Aug-13	0	0	0	0	\$0	-	-	-	-	-
Sep-13	0	0	0	0	\$0	-	-	-	-	-
Oct-13	10	0	10	2	\$38	-	-	-	-	-
Nov-13	2,546	0	2,546	550	\$500	-	-	-	-	-
Dec-13	4,655	0	4,655	1,006	\$929	\$0.92	75%	90%	839	168
Jan-14	5,595	0	5,595	1,210	\$1,175	\$0.97	75%	90%	1,008	202
Feb-14	6,669	0	6,669	1,442	\$1,532	\$1.06	75%	90%	1,202	240
	29,164	0	29,164	6,306	\$5,842	\$0.93			4,756	951

Existing Conditions and Assumptions

1- Existing boiler's estimated efficiency = 75 %

2-Domestic Water Usage Estimated based on natural gas consumption during cooling season.

Cost Analysis

Modular Boilers (1 x 750 MBH)

\$15,000

Accessories

\$5,000

Boiler Installation

\$20,000

Proposed Changes

1 - Replace Crown Boiler with a high efficiency condensing hot water boilers.

2 - Reconnect existing hot water pipes to new boiler hot water supply

Total

\$40,000

Rebates

\$1,313

Boiler Replacement - Design Basis

Boiler	# of Units	Capacity, MBH	Action	Proposed
Any condensing boiler manufacturer	1	750	Replace boiler	1 x 750 MBH Modular Condensing Hot Water Boiler. A thorough hot water load analysis should be performed by a professional engineer before implementing this ECM.



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Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #6:

BUILDING AUTOMATION SYSTEM

Building Automation System Installation - Energy Savings - Mountain View Water Pollution Control Facility (Wet & Dry Phase)

Total Fuel Oil Consumption	15,000	Gallons
Total Natural Gas Consumption	18,663	Therms
Total Electricity Consumption **	419,900	kWh

The average energy savings are as follows based on the referenced report*:

Estimated Energy Savings for this facility

5%-15%

10%

Total Oil Savings	1,500	Gallons
Total Natural Gas Savings	1,866	Therms
Total Electricity Savings	41,990	kWh

Estimated Installation Cost	\$2.5/SF
Estimated Installation Cost	\$209,950

NJ Smart Start Custom Measures Rebate Program

Estimated Rebates (Electricity Savings)	\$0.16 /kWh
Estimated Rebates (Gas Savings)	\$1.00 /Therm
Estimated Rebates (Electricity Savings)	\$6,718
Estimated Rebates (Gas Savings)	<u>\$1,866.30</u>
Total	\$8,585

*A Building Automation System has the potential to produce substantial energy savings by monitoring and controlling the large energy using equipment in a facility. According to a U.S. DOE sponsored study ("Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways, 2005", commercial buildings save 5-15% energy savings by implementing Energy Management and Control Systems.

** Significant portion of the total energy consumption of this building is used in waster water treatment processes.

Total HVAC related energy consumption is estimated based on following:

5 kWh/SF (Estimated HVAC Energy Cons.)



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Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #7:

PREMIUM EFFICIENCY MOTORS

Premium Efficiency Motors - Mountain View WPCF (Wet & Dry Phase)

Existing Equipment	Motor HP	Hours of Operation	Existing Efficiency	Proposed NEMA Efficiency	Power Savings, kW	Energy Savings, kWh	Energy Cost Savings	Installed Cost	Incentives	Cost After Incentives	Payback After Rebate	Replace	Net Installed Cost	Energy Cost Savings	Payback After Rebate
Ash Brook, Water Pump #1	7.5	5,840	84.0%	91.7%	0.50	2,955	\$371	\$1,971	\$90	\$1,881	5	Y	\$1,881	\$371	4.8
Ash Brook, Water Pump #2	7.5	5,840	84.0%	91.7%	0.50	2,955	\$371	\$1,971	\$90	\$1,881	5	Y	\$1,881	\$371	4.8
Sevice Building Boiler Pump #3	7.5	2,190	86.0%	91.7%	0.36	801	\$101	\$1,971	\$90	\$1,881	19	Y	\$1,881	\$101	17.8
Sevice Building Boiler Pump #4	7.5	2,190	86.0%	91.7%	0.36	801	\$101	\$1,971	\$90	\$1,881	19	Y	\$1,881	\$101	17.8
Secondary Clarifer De-watering Pump	5.0	2,000	85.5%	90.2%	0.20	411	\$52	\$1,519	\$60	\$1,459	28	Y	\$1,459	\$52	27.1
Service Building AHU	5.0	4,380	82.5%	90.2%	0.35	1,530	\$192	\$1,519	\$60	\$1,459	8	Y	\$1,459	\$192	7.3
Thickener Building Rake Motor	15.0	5,475	88.5%	92.4%	0.48	2,644	\$332	\$3,652	\$115	\$3,537	11	Y	\$3,537	\$332	10.3
Thickener Building Rake Motor	15.0	5,475	88.5%	92.4%	0.48	2,644	\$332	\$3,652	\$115	\$3,537	11	Y	\$3,537	\$332	10.3
Thickener Building Rake Motor	15.0	5,475	88.5%	92.4%	0.48	2,644	\$332	\$3,652	\$115	\$3,537	11	Y	\$3,537	\$332	10.3
Thickener Building Sludge Pumps	7.5	3,000	85.5%	91.7%	0.40	1,201	\$151	\$1,971	\$90	\$1,881	12	Y	\$1,881	\$151	11.9
Thickener Building Sludge Pumps	7.5	3,000	85.5%	91.7%	0.40	1,201	\$151	\$1,971	\$90	\$1,881	12	Y	\$1,881	\$151	11.9
Thickener Building Sludge Pumps	7.5	3,000	85.5%	91.7%	0.40	1,201	\$151	\$1,971	\$90	\$1,881	12	Y	\$1,881	\$151	11.9
Thickener Building Sludge Pumps	7.5	3,000	85.5%	91.7%	0.40	1,201	\$151	\$1,971	\$90	\$1,881	12	Y	\$1,881	\$151	11.9
Thickener Building Sludge Pumps	7.5	3,000	85.5%	91.7%	0.40	1,201	\$151	\$1,971	\$90	\$1,881	12	Y	\$1,881	\$151	11.9
Thickener Building Sludge Pumps	7.5	3,000	85.5%	91.7%	0.40	1,201	\$151	\$1,971	\$90	\$1,881	12	Y	\$1,881	\$151	11.9
Chlorine Building - HW Boiler Pump	7.5	2,190	85.5%	91.7%	0.40	877	\$110	\$1,971	\$90	\$1,881	17	Y	\$1,881	\$110	16.3
Secondary Clarifer Air compressor	15.0	2,190	85.6%	92.4%	0.87	1,906	\$239	\$3,652	\$115	\$3,537	15	Y	\$3,537	\$239	14.3
Total	168				8	30,019	\$3,766	\$42,979	\$1,685	\$41,294	11.0		\$41,294	\$3,766	10.9

Aggregated Cost of Electricty	\$0.125 /kWh
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ECM #8:

VENDING MACHINE POWER MANAGEMENT

Vending Machine Power Management

	Wayne Township Building	DPW Garage	Wayne Public Library	Total
Soda Vending Machine Count	2	1	2	5
Snack Vending Machine Count	2	1	1	4
Annual Run-Time Factor	100%	100%	100%	100%
Electrical Unit Cost, \$ per kWh	\$0.140	\$0.149	\$0.144	

Soda Machine Power Consumption,kW	0.4	Estimated based on vendor cutsheets
Snack Machine Power Consumption,kW	0.08	
Annual Savings %	46%	
Cost Each	\$275	
Total Cost	\$2,475	

Wayne Township Building	Existing Condition	Proposed System	Savings	Cost	PB
Soda Machine Power Consumption	100%	54%	-	\$1,100	2.0
Annual Op Cost	\$1,178	\$636	-		
Run Hours	8,760	8,760	-		
Annual Energy Consumption (kWh)	8,410	4,541	3,868		
Annual Cost and Savings \$	\$1,178	\$636	\$542		

DPW Garage	Existing Condition	Proposed System	Savings	Cost	PB
Soda Machine Power Consumption	100%	54%	-	\$550	1.9
Annual Op Cost	\$626	\$338	-		
Run Hours	8,760	8,760	-		
Annual Energy Consumption (kWh)	4,205	2,271	1,934		
Annual Cost and Savings \$	\$626	\$338	\$288		



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ECM #9:

AERATION SYSTEM CONTROLS UPGRADE

Automatic DO Control - Energy Savings

Existing Aeration Systems at Wayne Township WPCF	
Aerator HP	40 HP
# of Aerators	16
Total Aerator Power	640 HP
Estimated Hours of Operation	4380 /hours/unit/year
Total Energy Consumption	2445833 kWh (Estimated)
Estimated Energy Savings	5% *
Total Energy Savings	122292 kWh
Total Demand Savings	28 kW
System Installed Cost	\$98,000 **
Custom Rebate (NJ Cleanenergy)	\$19,567 (\$0.16/kWh)

* Based on literature research. A more thorough analysis of the operation is required for more accurate energy savings calculations (Evaluation of Energy Conservation Measures, 2010, EPA).

** Estimated based on actual installation for a similar facility.



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ECM #10:

SERVICE WATER PUMP REPLACEMENT

WPCF: New Service Water Pump

Existing Service Water Pumps	
Pump HP	100 HP
# of Pumps	3
# of Pumps run at a time	1
Average Pump Load	50%
Average Pump Power	50 HP
Estimated Hours of Operation	8760 /hours/unit/year
Total Energy Consumption	382161 kWh (Estimated)
Estimated Pump Efficiency at Average Conditions	60%
New pump efficiency	75%
Estimated Energy Savings	8%
Total Energy Savings	29397 kWh
Total Demand Savings	0 kW
System Installed Cost	\$74,700
Custom Rebate (NJ Cleanenergy)	\$4,704 (\$0.16/kWh)



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ECM #11:

BOILER FUEL SWITCHING

BOILER FUEL SWITCHING CALCULATIONS

WAYNE WPCF has electric heating in the maintenance shop and oil heating in the wet phase structures.

Electric Heating Energy Calculations

Estimated Total Heating Coil Capacity	200,000	Btu/h
Annual Heating Degree Days	4184	Base 60F (2013-2014)
Load Factor	60%	
Heating System Efcy	100%	
Estimated Annual Heating Energy	502	MMBTUs
	147108	kWh
	\$18,458	

#2 Fuel Oil Heating Energy Calculations

Facility Total Natural Gas Usage	15,000	Gallons
Heating System Efcy	80%	
Estimated Annual Heating Energy	1740	MMBTUs
Cost	\$2.95	/Gallon
	\$44,243	
Total Annual Heating Energy	2242	MMBTUs

PROPOSED SYSTEM

A GAS FIRED CONDENSING BOILER FEEDING WET PHASE STRUCTURES AND MAINTANANCE SHOP

Total Annual Heating Energy	2,242	MMBTUs
Heating System Efcy	95%	
	2360	MMBTUs
	23601	Therms

Install one (1) 2,000 MBH Gas Fired Condensing Boiler

Equipment	\$15,000		
Installation	\$150,000		
Total	\$165,000		
		Rebate	\$2,000

*The proposed system is to run during winter only due to lack of thermal load during summer



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Tel: 732.590.0122
Fax: 732.590.0129

ECM #12:

VARIABLE FREQUENCY DRIVES

ID	Building	Equipment	Location	Scope of Work	Nominal Power, HP	Existing Efficiency	Proposed NEMA Prm Efficiency	Estimated Hours of Operation	Existing Energy Consumption, kWh	VFD Energy Saving %	Improved Energy Consumption, kWh	Energy Savings, kWh
1	Mountain View WPCF (Wet&Dry)	Pump	Service Building, Compressor Room	Replace motor starter with VFD. Run speed based on supply pressure.	20.0	89.0%	93.0%	1500	18,161	35%	11,297	6,864
2		Pump			20.0	93.0%	93.0%	1500	17,380	35%	11,297	6,083
3		Boiler Pump	Service Building Boiler Room	Install VFD. Set minimum speed based on minimum boiler flow. Modulate flow based on head pressure.	7.5	86.0%	91.0%	2190	10,290	25%	7,293	2,997
4		Boiler Pump	Service Building Boiler Room		7.5	87.0%	91.0%	2190	10,172	25%	7,293	2,878
5		Boiler Pump	Service Building Boiler Room		7.5	87.0%	91.0%	2190	10,172	25%	7,293	2,878
6		Cooling Water Pump Bay Area	Service Building 1st Fl.	Install VFD. Set speed based on head pressure.	20.0	91.0%	93.0%	4380	51,865	25%	38,062	13,803
7		Main Thickner Rakes	Thickener Building	Install VFDs.Establish a minimum speed based on thickening performance. Then modulate speed based on total plant load.	15.0	91.0%	93.0%	2190	19,449	30%	13,322	6,128
8		Main Thickner Rakes	Thickener Building		15.0	91.0%	93.0%	2190	19,449	30%	13,322	6,128
9		Main Thickner Rakes	Thickener Building		15.0	91.0%	93.0%	2190	19,449	30%	13,322	6,128
10		Main Thickner Rakes	Thickener Building		15.0	91.0%	93.0%	2190	19,449	30%	13,322	6,128
11		Sludge Pumps	Thickener Building	Install VFDs.Establish a minimum speed based on thickening performance. Then modulate speed based on total plant load.	25.0	91.0%	93.6%	4380	64,831	25%	47,273	17,558
12		Sludge Pumps	Thickener Building		7.5	87.0%	91.0%	4380	20,344	25%	14,587	5,757
13		Sludge Pumps	Thickener Building		7.5	87.0%	91.0%	2190	10,172	25%	7,293	2,878
14		Sludge Pumps	Thickener Building		7.5	87.0%	91.0%	2190	10,172	25%	7,293	2,878
15		Sludge Pumps	Thickener Building		7.5	87.0%	91.0%	2190	10,172	25%	7,293	2,878
16		Sludge Pumps	Thickener Building		7.5	87.0%	91.0%	2190	10,172	25%	7,293	2,878
17		Thickened Sludge Pump	Thickener Building		25.0	91.0%	93.6%	4380	64,831	25%	47,273	17,558
18		HW Pump	Chlorine Building	Install VFD. Set speed based on head pressure.	7.5	87.0%	91.0%	2190	10,172	25%	7,293	2,878
19		HW Pump	Chlorine Building		7.5	87.0%	91.0%	2190	10,172	25%	7,293	2,878
20		Primary sludge pumps	Primary Clarifier	Install VFD. Set speed based on plant load	15.0	92.0%	93.0%	8760	76,952	25%	57,093	19,858
21	Primary sludge pumps	Primary Clarifier	15.0		92.0%	93.0%	4380	38,476	25%	28,547	9,929	
22	Primary sludge pumps	Primary Clarifier	15.0		92.0%	93.0%	2190	19,238	25%	14,273	4,965	
23	Primary sludge pumps	Primary Clarifier		15.0	92.0%	93.0%	2190	19,238	25%	14,273	4,965	
24	Air compressor	Outside of the main Thickner Building	Install VFD. Set speed based on head pressure.	5.0	89.0%	89.5%	2000	6,054	25%	4,515	1,539	
25	Air compressor	Chlorine Electric Building Between Generator Room and Boiler Room		40.0	92.0%	94.1%	1460	34,201	25%	25,078	9,123	
26	Air compressor	Chlorine Electric Building Between Generator Room and Boiler Room		40.0	92.0%	94.1%	1460	34,201	25%	25,078	9,123	
27	Air compressor	Secondary Roof, Secondary Sublevel		15.0	87.0%	93.0%	1460	13,562	25%	9,516	4,047	
28	West Belt Water Pump Station	Water Pump	Pump Station	Install VFD. Modify PLC controls to maintain system pressure by modulating pump speed and staggered dispatching	150.0	94.5%	95.8%	2500	213,801	20%	168,720	45,081
29		Water Pump	Pump Station		150.0	94.5%	95.8%	2000	171,041	20%	134,976	36,065
30		Water Pump	Pump Station		250.0	94.5%	96.0%	3000	427,601	20%	336,736	90,865
31		Water Pump	Pump Station		250.0	94.5%	96.0%	2500	356,335	20%	280,613	75,721
32		Water Pump	Pump Station		250.0	94.5%	96.0%	2000	285,068	20%	224,491	60,577
				Total					2,102,638		1,612,624	490,013
	Load Factor	65%										
	Power Factor	90%										

VARIABLE FREQUENCY DRIVES (CONT'D)

ID	BUILDING	EQUIPMENT	LOCATION	NOMINAL POWER, HP	ENERGY SAVINGS, \$	DEMAND SAVINGS	MOTOR COST	VFD COST	TOTAL INSTALLED COST	INCENTIVES	NET COST	PAYBACK PERIOD
1	Mountain View WPCF (Wet&Dry)	Pump	Service Building, Compressor Room	20.0	\$861	0.5	\$2,355	\$5,075	\$7,430	\$1,313	\$6,117	7.1
2		Pump		20.0	\$763	0.0	\$2,355	\$5,075	\$7,430	\$1,313	\$6,117	8.0
3		Boiler Pump	Service Building Boiler Room	7.5	\$376	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	6.6
4		Boiler Pump	Service Building Boiler Room	7.5	\$361	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	6.9
5		Boiler Pump	Service Building Boiler Room	7.5	\$361	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	6.9
6		Cooling Water Pump Bay Area	Service Building 1st Fl.	20.0	\$1,732	0.2	\$2,355	\$5,075	\$7,430	\$1,313	\$6,117	3.5
7		Main Thickner Rakes	Thickener Building	15.0	\$769	0.2	\$1,942	\$4,525	\$6,467	\$1,904	\$4,563	5.9
8		Main Thickner Rakes	Thickener Building	15.0	\$769	0.2	\$1,942	\$4,525	\$6,467	\$1,904	\$4,563	5.9
9		Main Thickner Rakes	Thickener Building	15.0	\$769	0.2	\$1,942	\$4,525	\$6,467	\$1,904	\$4,563	5.9
10		Main Thickner Rakes	Thickener Building	15.0	\$769	0.2	\$1,942	\$4,525	\$6,467	\$1,904	\$4,563	5.9
11		Sludge Pumps	Thickener Building	25.0	\$2,203	0.4	\$3,080	\$6,400	\$9,480	\$1,617	\$7,863	3.6
12		Sludge Pumps	Thickener Building	7.5	\$722	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	3.5
13		Sludge Pumps	Thickener Building	7.5	\$361	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	6.9
14		Sludge Pumps	Thickener Building	7.5	\$361	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	6.9
15		Sludge Pumps	Thickener Building	7.5	\$361	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	6.9
16		Sludge Pumps	Thickener Building	7.5	\$361	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	6.9
17		Thickened Sludge Pump	Thickener Building	25.0	\$2,203	0.4	\$3,080	\$6,400	\$9,480	\$1,617	\$7,863	3.6
18		HW Pump	Chlorine Building	7.5	\$361	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	6.9
19		HW Pump	Chlorine Building	7.5	\$361	0.2	\$1,116	\$2,625	\$3,741	\$1,244	\$2,498	6.9
20		Primary sludge pumps	Primary Clarifier	15.0	\$2,492	0.1	\$1,942	\$4,525	\$6,467	\$1,904	\$4,563	1.8
21		Primary sludge pumps	Primary Clarifier	15.0	\$1,246	0.1	\$1,942	\$4,525	\$6,467	\$1,904	\$4,563	3.7
22		Primary sludge pumps	Primary Clarifier	15.0	\$623	0.1	\$1,942	\$4,525	\$6,467	\$1,904	\$4,563	7.3
23		Primary sludge pumps	Primary Clarifier	15.0	\$623	0.1	\$1,942	\$4,525	\$6,467	\$1,904	\$4,563	7.3
24		Air compressor	Outside of the main Thickner Building	5.0	\$193	0.0	\$949	\$2,425	\$3,374	\$829	\$2,545	13.2
25		Air compressor	Chlorine Electric Building Between Generator Room and Boiler Room	40.0	\$1,145	0.5	\$4,778	\$10,700	\$15,478	\$2,562	\$12,916	11.3
26		Air compressor	Chlorine Electric Building Between Generator Room and Boiler Room	40.0	\$1,145	0.5	\$4,778	\$10,700	\$15,478	\$2,562	\$12,916	11.3
27		Air compressor	Secondary Roof, Secondary Sublevel	15.0	\$508	0.5	\$1,942	\$4,525	\$6,467	\$1,904	\$4,563	9.0
28	West Belt Water Pump Station	Water Pump	Pump Station	150.0	\$5,863	1.0	\$17,918	\$27,500	\$45,418	\$9,630	\$35,788	6.1
29		Water Pump	Pump Station	150.0	\$4,690	1.0	\$17,918	\$27,500	\$45,418	\$9,630	\$35,788	7.6
30		Water Pump	Pump Station	250.0	\$11,817	2.0	\$29,863	\$40,000	\$69,863	\$15,750	\$54,113	4.6
31		Water Pump	Pump Station	250.0	\$9,847	2.0	\$29,863	\$40,000	\$69,863	\$15,750	\$54,113	5.5
32		Water Pump	Pump Station	250.0	\$7,878	2.0	\$29,863	\$40,000	\$69,863	\$15,750	\$54,113	6.9
					62,893	14			471,616	109,207	362,409	5.8



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RENEWABLES CALCULATIONS

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**WAYNE TOWNSHIP
RENEWABLE CALCULATIONS
SOLAR ENERGY**

Building	Spaces	W (ft)	L (ft)	Area (SF)	Total Area (SF)
Wayne Township Building	Roof	100	45	4,500	10,500
Wayne Township Building	Roof	100	35	3,500	
Wayne Township Building	Roof	100	25	2,500	
Wayne Public Library	Roof	30	35	1,050	4,125
Wayne Public Library	Roof	15	50	750	
Wayne Public Library	Roof	20	35	700	
Wayne Public Library	Roof	25	50	1,250	
Wayne Public Library	Roof	15	25	375	

DPW Garage	Roof	60	25	1,500	8,500
DPW Garage	Roof	20	125	2,500	
DPW Garage	Roof	60	75	4,500	
					23,125

Current Consumption	kWh
Municipal Building	959,800
Public Library	605,159
DPW Garage	225,000
Total	1,789,959

13	W/SF
1247	kWh/KW-DC/yr
\$3	/Watt Installed Cost

	Estimated Capacity, kWdc	Est. Annual Generation, kWh	Annual Reduction	Estimated Cost
Wayne Township Building	137	170,167	18%	\$409,500
Wayne Public Library	54	66,851	11%	\$160,875
DPW Garage	111	137,754	61%	\$331,500
Total	301	374,773	21%	\$901,875

SREC /MWh

**WAYNE TOWNSHIP
RENEWABLE CALCULATIONS
SOLAR ENERGY**

Building	Municipal Building	DPW Garage	Public Library	Total
Locations to Install Panels	Roof	Roof	Roof	
Assumptions				
System Capacity, kW-dc (maximum utilization of roof space)	137	111	54	301
Annual Electric Generation, kWhrs of AC electricity produced	170,167	137,754	66,851	374,773
Total Annual Facility Electric Use, kWhrs	959,800	225,000	605,159	1,789,959
% of Total Annual Usage	18%	61%	11%	21%
All-In Cost of Electricity Year 1	\$0.140	\$0.149	\$0.144	\$0.144
Annual Electric Cost Savings	\$23,843	\$20,522	\$9,652	\$54,017
Estimated SREC Value (Year 1)	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC
Estimated year 1 SREC Revenue	\$17,017	\$13,775	\$6,685	\$37,477
Estimated Total Annual Revenue	\$40,860	\$34,297	\$16,338	\$91,494
Environmental Impact				
Equivalent Annual CO2 Emission Reduction (tons per year)	56.2	45.5	22.1	123.7
Equivalent Cars Removed From Road Annually	10	8	4	21
Equivalent Acres of Trees Planted Annually	15	12	6	34
Financial Results				
System Installed Cost	\$409,500	\$331,500	\$160,875	\$901,875
Simple Payback (Years)	10	10	10	10
IRR (25 Years)	9%	9%	11%	10%
Net Present Value (25 yrs, 4% discount rate)	\$352,395	\$352,395	\$348,233	\$914,745
1.Estimated CO2 Emissions Rate: 0.66 lbs/kWh 2.EPA Estimate: 11,560 CO2 per car 3.EPA Estimate:7,333 lbs CO2 per acre of trees planted				

Municipal Building & Public Library



DPW Garage



RENEWABLE CALCULATIONS

Municipal Building

Electric Cost \$0.14
SREC \$0.10
Total \$0.24
Energy Cost Annual Escalation 3%
Annual Capacity Loss 1.00%

Year	Investment	Electric Generation kWh	Energy Cost Savings	Maint Cost	Net Cash Flow	Cumulative Cash Flow
0	\$409,500	0	0	0	(\$409,500)	0
1	0	170,167	\$40,860	0	\$40,860	(\$368,640)
2	0	168,465	\$41,665	0	\$41,665	(\$326,975)
3	0	166,764	\$42,481	0	\$42,481	(\$284,494)
4	0	165,062	\$43,309	0	\$43,309	(\$241,185)
5	0	163,360	\$44,149	1719	\$44,149	(\$197,036)
6	0	161,659	\$44,999	1711	\$44,999	(\$152,037)
7	0	159,957	\$45,861	1702	\$45,861	(\$106,175)
8	0	158,255	\$46,735	1694	\$46,735	(\$59,440)
9	0	156,554	\$47,619	1685	\$47,619	(\$11,821)
10	0	154,852	\$48,515	1677	\$48,515	\$36,693
11	0	153,150	\$49,421	1668	\$49,421	\$86,115
12	0	151,449	\$50,338	1660	\$50,338	\$136,453
13	0	149,747	\$51,266	1652	\$51,266	\$187,718
14	0	148,045	\$52,204	1643	\$52,204	\$239,922
15	0	146,344	\$53,152	1635	\$53,152	\$293,073
16	0	144,642	\$54,110	1627	\$54,110	\$347,183
17	0	142,940	\$55,077	1619	\$55,077	\$402,260
18	0	141,239	\$56,054	1611	\$56,054	\$458,314
19	0	139,537	\$57,040	1603	\$57,040	\$515,355
20	0	137,835	\$58,035	1595	\$58,035	\$573,389
21	0	136,134	\$59,038	1587	\$59,038	\$632,427
22	0	134,432	\$60,049	1579	\$60,049	\$692,476
23	0	132,730	\$61,068	1571	\$61,068	\$753,544
24	0	131,029	\$62,093	1563	\$62,093	\$815,637
25	0	129,327	\$63,125	1555	\$63,125	\$878,763
					\$1,288,263	\$5,301,519

Net Present Value	\$352,395
Internal Rate of Return	8.95%

RENEWABLE CALCULATIONS

DPW Garage

Electric Cost \$0.15
SREC \$0.10
Total \$0.25
Energy Cost Annual Escalation 3%
Annual Capacity Loss 0.50%

Year	Investment	Electric Generation kWh	Energy Cost Savings	Maint Cost	Net Cash Flow	Cumulative Cash Flow
0	\$331,500	0	0	0	(\$331,500)	0
1	0	137,754	\$34,297	0	\$34,297	(\$297,203)
2	0	137,065	\$35,149	0	\$35,149	(\$262,054)
3	0	136,377	\$36,022	0	\$36,022	(\$226,032)
4	0	135,688	\$36,915	0	\$36,915	(\$189,117)
5	0	134,999	\$37,829	1392	\$37,829	(\$151,287)
6	0	134,310	\$38,766	1385	\$38,766	(\$112,522)
7	0	133,622	\$39,724	1378	\$39,724	(\$72,798)
8	0	132,933	\$40,705	1371	\$40,705	(\$32,094)
9	0	132,244	\$41,709	1364	\$41,709	\$9,615
10	0	131,555	\$42,736	1357	\$42,736	\$52,351
11	0	130,867	\$43,788	1351	\$43,788	\$96,139
12	0	130,178	\$44,864	1344	\$44,864	\$141,002
13	0	129,489	\$45,965	1337	\$45,965	\$186,968
14	0	128,800	\$47,092	1330	\$47,092	\$234,060
15	0	128,111	\$48,246	1324	\$48,246	\$282,306
16	0	127,423	\$49,426	1317	\$49,426	\$331,732
17	0	126,734	\$50,634	1311	\$50,634	\$382,366
18	0	126,045	\$51,869	1304	\$51,869	\$434,235
19	0	125,356	\$53,133	1297	\$53,133	\$487,368
20	0	124,668	\$54,427	1291	\$54,427	\$541,795
21	0	123,979	\$55,750	1284	\$55,750	\$597,545
22	0	123,290	\$57,103	1278	\$57,103	\$654,648
23	0	122,601	\$58,488	1272	\$58,488	\$713,135
24	0	121,912	\$59,904	1265	\$59,904	\$773,039
25	0	121,224	\$61,352	1259	\$61,352	\$834,392
					\$1,165,892	\$5,409,588

Net Present Value	\$348,233
Internal Rate of Return	10.50%

RENEWABLE CALCULATIONS

Public Library

Electric Cost \$0.14
SREC \$0.10
Total \$0.24
Energy Cost Annual Escalation 3%
Annual Capacity Loss 0.50%

Year	Investment	Electric Generation kWh	Energy Cost Savings	Maint Cost	Net Cash Flow	Cumulative Cash Flow
0	\$160,875	0	0	0	(\$160,875)	0
1	0	66,851	\$16,644	0	\$16,644	(\$144,231)
2	0	137,065	\$35,149	0	\$35,149	(\$109,082)
3	0	136,377	\$36,022	0	\$36,022	(\$73,060)
4	0	135,688	\$36,915	0	\$36,915	(\$36,145)
5	0	134,999	\$37,829	675	\$37,829	\$1,685
6	0	134,310	\$38,766	672	\$38,766	\$40,450
7	0	133,622	\$39,724	669	\$39,724	\$80,174
8	0	132,933	\$40,705	665	\$40,705	\$120,879
9	0	132,244	\$41,709	662	\$41,709	\$162,587
10	0	131,555	\$42,736	659	\$42,736	\$205,323
11	0	130,867	\$43,788	655	\$43,788	\$249,111
12	0	130,178	\$44,864	652	\$44,864	\$293,975
13	0	129,489	\$45,965	649	\$45,965	\$339,940
14	0	128,800	\$47,092	646	\$47,092	\$387,032
15	0	128,111	\$48,246	642	\$48,246	\$435,278
16	0	127,423	\$49,426	639	\$49,426	\$484,704
17	0	126,734	\$50,634	636	\$50,634	\$535,338
18	0	126,045	\$51,869	633	\$51,869	\$587,207
19	0	125,356	\$53,133	630	\$53,133	\$640,340
20	0	124,668	\$54,427	626	\$54,427	\$694,767
21	0	123,979	\$55,750	623	\$55,750	\$750,517
22	0	123,290	\$57,103	620	\$57,103	\$807,620
23	0	122,601	\$58,488	617	\$58,488	\$866,108
24	0	121,912	\$59,904	614	\$59,904	\$926,011
25	0	121,224	\$61,352	611	\$61,352	\$987,364
					\$1,148,239	\$9,233,892

Net Present Value	\$495,975
Internal Rate of Return	26.19%

Electric Cost \$0.14
SREC \$0.10
Total \$0.24
Energy Cost Annual Escalation 3%
Capacity Loss 0.50%

WAYNE TOWNSHIP

Year	Investment	Electric Generation (kWh)	Energy Cost Savings	Maint Cost	Net Cash Flow	Cumulative Cash Flow
0	\$901,875	0	0	0	(\$901,875)	0
1	0	374,773	\$91,629	0	\$91,629	(\$810,246)
2	0	372,899	\$93,906	0	\$93,906	(\$716,340)
3	0	371,025	\$96,237	0	\$96,237	(\$620,104)
4	0	369,151	\$98,623	0	\$98,623	(\$521,480)
5	0	367,277	\$101,066	3786	\$101,066	(\$420,414)
6	0	365,403	\$103,567	3767	\$103,567	(\$316,846)
7	0	363,529	\$106,127	3749	\$106,127	(\$210,719)
8	0	361,655	\$108,748	3730	\$108,748	(\$101,972)
9	0	359,782	\$111,430	3711	\$111,430	\$9,458
10	0	357,908	\$114,175	3693	\$114,175	\$123,633
11	0	356,034	\$116,984	3674	\$116,984	\$240,617
12	0	354,160	\$119,860	3656	\$119,860	\$360,477
13	0	352,286	\$122,802	3638	\$122,802	\$483,279
14	0	350,412	\$125,814	3619	\$125,814	\$609,093
15	0	348,538	\$128,895	3601	\$128,895	\$737,988
16	0	346,665	\$132,048	3583	\$132,048	\$870,036
17	0	344,791	\$135,274	3565	\$135,274	\$1,005,310
18	0	342,917	\$138,575	3548	\$138,575	\$1,143,885
19	0	341,043	\$141,953	3530	\$141,953	\$1,285,838
20	0	339,169	\$145,408	3512	\$145,408	\$1,431,246
21	0	337,295	\$148,943	3495	\$148,943	\$1,580,189
22	0	335,421	\$152,559	3477	\$152,559	\$1,732,747
23	0	333,548	\$156,257	3460	\$156,257	\$1,889,005
24	0	331,674	\$160,041	3442	\$160,041	\$2,049,046
25	0	329,800	\$163,911	3425	\$163,911	\$2,212,957
					\$3,114,832	\$14,046,682

Net Present Value	\$914,745
Internal Rate of Return	10%

RENEWABLE ENERGY ANALYSIS - COMBINED HEAT AND POWER

Facility has electric heating in the maintenance shop and oil heating in the wet phase structures.

Electric Heating Energy Calculations

Estimated Total Heating Coil Capacity	200,000	Btu/h
Annual Heating Degree Days	4184	Base 60F (2013-2014)
Load Factor	60%	
Heating System Efcy	100%	
Estimated Annual Heating Energy	502	MMBTUs
Cost	\$36.62	/MMBTU

#2 Fuel Oil Heating Energy Calculations

Facility Total Natural Gas Usage	15,000	Gallons
Heating System Efcy	80%	
Estimated Annual Heating Energy	1740	MMBTUs
Cost	\$18.57	/MMBTU
Average Heating Fuel Cost	\$27.60	/MMBTU
Total Heating Energy Consumption	2242	MMBTUs

System Selection	150 kW engine	(2 x 75 kW)
Generation Efficiency	40%	
Heating Efficiency	40%	
Heat Generation	204.78	MBH
Monthly Heat Generation	147.4	MMBTU
6-Month Heat Generation	885	MMBTU
Annual Electricity Generation	648,000	kWh/Yr
Annual Gas Consumption	2,212	MMBTUs
Fuel Cost	\$8.00	/MMBTU

*The proposed system is to run during winter only due to lack of thermal load during summer

RENEWABLE ENERGY ANALYSIS - COMBINED HEAT AND POWER

CHP/COGENERATION FEASIBILITY ANALYSIS		
<u>Simple Payback</u>		
System Size	150 kW	
Total Installed Cost	\$3,000 /kW	\$450,000
State Grant	\$1,000 /kW	(\$150,000)
Federal Investment Tax Credit	\$0 /kW	\$0
Net Installed Cost		\$300,000
<u>Year 1 Annual Savings</u>		
Avoided Electric Energy:	648,000 kWh	\$81,000
Avoided Heating Fuel:	885 MMBTU	\$24,415
Avoided Cooling:	0 kWh	\$0
CHP Gas:	2,212 MMBTU	(\$17,693)
Service Contract:	2.7 ¢/kWh	(\$17,496)
Net Annual Savings (Year 1)		\$70,226
Simple Payback		4.3