TABLE OF CONTENTS

2.3 Energy Conservation Measure/Cost Submittal

2.3-1 Energy Conservation Measures

- **a.** Every ECM described in Appendix document is either calculated into the project scope or the Proposer set forth a detailed justification for exclusion of the ECM
- **b.** Proposal provides a preliminary assessment of the ECMs, including a detailed estimate of implementation costs and energy cost savings (including detailed calculations) for each ECM
- **c.** Proposal thoroughly demonstrates the technical feasibility, suitability, reasonableness, comprehensiveness and acceptability of the proposed ECMs, including the proposed equipment and level of quality of the equipment for the proposed savings
- **d.** Proposal includes additional ECMs not already included in the project

2.3-2 Energy Audit

- **a.** Proposal clearly and thoroughly describes the scope of the Energy Audit, including systems covered, personnel, methodology and schedule milestones
- **b.** Proposal thoroughly discusses how the Proposer's approach to the Energy Audit will comply with DGS' Energy Audit format
- **c.** Proposer clearly and thoroughly describes a reasonable and transparent approach to pricing the costs to prepare an Energy Audit for this project

2.3-3 Costs

- **a.** Degree to which the proposed energy analysis demonstrates sound engineering principles and the reasonableness of the proposed savings
- **b.** Proposer established a reasonable cost for preparing an Energy Audit for this scope of work in compliance with the methodology discussed in the Cost Submission.
- **c.** Proposal provides annual financial projections for the length of the contract and each projection appears in the proper format listed in the RFP

2.3-4 Measurement and Verification

a. Degree to which the proposed Measurement & Verification (M&V) plan adheres to all M&V protocol standards and demonstrates scalability for measurement and verification of the proposed energy baseline, adjustment factors and energy cost savings

b. Proposal clearly and thoroughly describes a reasonable and transparent approach to pricing the costs to measure and verify the guaranteed savings for the entire duration of the project

c. Proposal clearly indicates the M&V pricing is premised upon design and construction in compliance with DGS' Design Manual and General Conditions and also in compliance with the International Performance Measurement and Verification Protocol (IPMVP)

d. Proposal thoroughly describes the methods, schedule, scope and personnel who will be performing the Measurement & Verification

APPENDIX

Energy Calculations
Lighting Line-by-Line
Weatherization Line-by-Line
Equipment Cut Sheets
ESG Financials – Electronic Copy (Back Cover Sleeve)

Cover image courtesy of Charlene Reinhart char@zbzoom.net

2.3-1 Energy Conservation Measures

a. Confirmation of ECMs in the Appendix or Why They Were Excluded

ESG has addressed all of the core Energy Conservation Measures (ECMs) listed in the Appendix L of the RFP. Details involving these ECMs are discussed in the following section of this proposal.

b. Preliminary Assessment of ECMs Including Implementation Costs and Energy Savings

The table below identifies each ECM and breaks down the cost of each. Detailed energy calculations are located in the Appendix.

PENNSYLVANIA - SMALL GESA-4 DCNR

ECM	Annual Guaranteed Energy and Cost Savings and Project Costs Summary						
	Electric (kWh/yr)	Electric ($/yr)	Heating Fuel (kBTU/yr)	Heating Fuel ($/yr)	Total Savings ($/yr)	Implementation Cost	Simple Payback (years)
Building Weatherization and Insulation Improvements	70,725	$ 6,304	2,247,465	$ 32,699	**$39,003**	**$383,210**	**9.8**
Controls Upgrades	71,463	$ 6,189	474,269	$ 6,900	**$13,089**	**$35,851**	**2.7**
Install Instantaneous Hot Water Heaters	72,790	$ 6,304	210,600	$ 3,064	**$9,368**	**$321,314**	**34.3**
Lighting Upgrades	1,829,279	$ 170,840	0	$ -	**$170,840**	**$1,466,098**	**8.6**
TOTAL (For ECMs Listed Above)	**2,044,257**	**$189,636**	**2,932,335**	**$42,664**	**$232,299**	**$2,206,473**	**9.5**

c. Technical Feasibility and Suitability of ECMs

ESG has performed a study of the technical feasibility and suitability of Energy Conservation Measures (ECMs) which would provide energy and cost savings to the Department of Conservation and Natural Resources (DCNR) facilities. This report provides a detailed preliminary assessment of the feasibility and cost effectiveness of such measures and indicates the potential for their implementation. The information used to develop the ECMs was obtained through building surveys to collect equipment information, interviews with operators and end users, and an inspection of the systems at the sites. The information obtained includes nameplate data, equipment age, condition, design of the system, actual load, operational practices, schedules, operations, and maintenance history. We divided the measures into separate categories to match Appendix L, "Core Energy Conservation Measures" in the RFP. In addition, we added two categories to include (1) ESG recommended ECMs that address DCNR's current needs and are cost effective to the overall project; and, (2) ECMs that will be considered during the Investment Grade Audit (IGA).

CORE ENERGY CONSERVATION MEASURES INDICATED IN THE RFP

TOM RIDGE ENVIRONMENTAL CENTER (TREC)

1. Retrofit the building and parks lighting systems to LED.
   ESG recommends converting many of the existing lighting fixtures to LED. Detail regarding the proposed lighting fixture upgrades can be found later in this section.

2. Correct the excessive negative pressure in the observation tower, eliminating or reducing the removal of treated air from within the TREC building.
   When the observation deck door is open, there is the potential for a negative pressure on the tower which could result in infiltration of conditioned air from the main building. The observation tower was designed to be isolated from the main building so there would be minimal infiltration from the main building when there is a negative pressure in the tower. However, if the doors from the TREC to the tower are left open, or, if there is a large enough negative pressure, then there is conditioned air infiltration. ESG recommends the reconfiguration of the existing dampers and exhaust fans in the observation tower to minimize conditioned air infiltration.
3. Repair/replace the failed fan powered reheat boxes located in the underfloor plenum.
   This repair would result in no energy savings benefit to DCNR and would not be a good fit under the PA Small GESA Program.
4. Determine the feasibility of adding individual private office temperature controls in lieu of shared controls.
   Adding controls to individual offices would require the installation of additional Variable Air Volume (VAV) boxes with reheat. This would require a significant redesign of the existing mechanical systems and would provide virtually no energy savings benefit to DCNR. ESG does not foresee a cost-effective solution for this type of conversion under the Small GESA Program.
5. Relocate thermostats located on outside walls to interior spaces. Utilize wireless devices where required.
   ESG has reviewed the drawings for the TREC and has identified the thermostats we can relocate from exterior walls to interior locations. Relocating these thermostats will eliminate the possibility of the thermostats not recording accurate temperatures of the spaces and reduce the heating and cooling demand on the AHUs.
6. Determine the existence of return air ductwork, and optimize the systems to provide outside air only when occupied and in amounts needed to satisfy ventilation requirements.
   There are currently energy recovery systems on the AHUs to recover energy from exhaust air for preconditioning the outside (ventilation) air. These systems are not capable of any further reduction in outside air based on their current design. Since there is already the capability for energy recovery, reducing the outside air flow would not yield appreciable energy savings. ESG will investigate ventilation air schedule in the building automation system during the IGA.
7. Evaluate the energy intensive lab equipment and determine if energy saving retrofits are possible. Consider flow control fume hoods.
   The lab equipment in use at TREC is designed for specific research and design purposes. The sensitive and specific nature of this equipment does not allow for any energy savings retrofits. ESG does not recommend including this work in the Small GESA due to a longer than 10-year Simple Payback.
   The fume hoods currently do not operate unless a user activates a switch to open the exhaust and make up air dampers when needed. Installation of variable flow control on the fume hoods would require the installation of VAV terminal boxes for the exhaust and makeup air and a redesign of the ductwork and mechanical systems. Further investigation of this ECM will be done during the IGA to determine the frequency and duration of usage accurately.
8. Repair or replace the heat recovery wheels and ensure they are operating as designed.
   At the time of the site survey, we discovered DCNR has already approved and funded a task order to repair the heat recovery wheels, thus we did not include it in our proposal.

9. Replace the existing exterior central station air handling units that utilize boiler water with new gas-fired equipment and variable outside air controls. This will improve the operating efficiency and reduce piping loses.
   Based on the current condition of the existing central station air handlers, ESG does not recommend upgrade or replacement to other technologies. The elimination of the heat losses through the insulated piping is minimal and the replacement of the equipment will not satisfy the financial requirements of a Small GESA.
10. Implement occupied/unoccupied temperature control schedules and ensure the HVAC systems are controlled with setback temperatures and reduced outside air ventilation.
    During our site survey we noted that the unoccupied controls within the current building automation system are not set properly The existing building automation system manufactured by TRANE is capable of performing advanced occupied and temperature setback controls, however, the system needs to be configured properly and recommissioned. ESG will implement the appropriate occupied/unoccupied schedules as well as temperature setback controls. This will result in energy savings by allowing the equipment to maintain unoccupied space conditions.
11. Replace the existing boilers with new, high efficiency units. The units are problematic and are likely costing the facility excessive service repair and operating costs. If the AHUs are replaced with gas fired heater, downsize the boilers to provide only the required capacity for the load served.
    At the time of the site survey, we discovered that DCNR had already approved and funded a task order to replace the existing boilers, and thus have not included them in this proposal.

MAINTENANCE BUILDING

1. Replace lighting with LED.
   ESG recommends converting many of the existing lighting fixtures to LED. Detail regarding the proposed lighting fixture upgrades can be found later in this section.
2. Install a gas-fired radiant tube heating system or bio mass boiler to eliminate the unit heaters.
   ESG does not recommend the installation of radiant tube heating systems, as this upgrade will not fit into the financial requirements of the Small GESA Program.
3. Replace the existing boiler and heating controls with occupied/unoccupied schedules.
   The boiler will be too costly to replace under Small GESA program as the Simple Payback will be well above the 10-year limit. The installation of HVAC controls is detailed further down in this document, after the detailed lighting table.

PRESQUE ISLE PARK – GENERAL

1. Consider LED lighting retrofits to all building, structures, and exteriors where lighting is used on a regular schedule.
   ESG recommends converting many of the existing lighting fixtures to LED. Detail regarding the proposed lighting fixture upgrades can be found later in this section.
2. Evaluate the individual wastewater treatment plant energy use and operating costs and determine if enough savings exist to help pay for installing pump stations and piping to a central wastewater treatment plant.
   At the time of the site survey, Presque Isle had already decommissioned the wastewater treatment plant and connected it to the local municipal wastewater system.

3. Evaluate the economic opportunity for wind power generation.
   Presque Isle already has a wind turbine installed at the Stull Interpretive Center. A recent storm has damaged the wind turbine beyond repair: high winds broke all three blades off of the turbine. Presque Isle would be a good location for more wind power generation, however this upgrade will not fit into the financial requirements of the Small GESA Program.

GENERAL ECMs FOR THE OTHER PARKS AND FORESTRY FACILITIES

1. LIGHTING AND LIGHTING CONTROLS
   Retrofit the buildings, parks forestry lighting systems to LED including lighting controls when applicable.
   ESG has include LED retrofits for all DCNR locations. LED technologies benefit DCNR facilities by reducing energy consumption used by lighting by as much as 50% and reduce peak demand. Lighting represents a major portion of DCNR's electricity use. In addition, lighting retrofit projects often improve the aesthetic appeal by providing brighter, whiter light and operating more quietly than older lighting systems, and maintenance costs are reduced due to the longer life of the LED equipment. Improvements to lighting will reduce electrical use, while meeting or exceeding existing light levels. The costs of material to maintain the current systems will also be reduced since these renovations replace items (i.e., lamps and ballasts) that are near the end of their life cycle with components capable of a significantly longer life cycle.

   Interior- The interior lighting design we propose for DCNR's park administrative buildings, such as park offices, marinas, maintenance buildings, and Bath Houses, consists predominantly of a 28 watt T8 to LED retrofit (with a small amount of 32 watt T8 and T12 to LED retrofits existing as well). Existing linear 4' T8/T12 fixtures are to be retrofitted from fluorescent lamps and electronic ballast, to Direct wire 12.5 watt LED T8 lamps. This system will eliminate the ballast and have the power run directly to the socket to power the LED lamps. This will result in a wattage reduction of approximately 50% and will eliminate the ballast as a maintenance concern.

   Incandescent and compact fluorescent light (CFL) screw-in fixtures make up a sizeable portion of the existing lighting system as well, especially in cabins. These fixtures will be re-lamped with new LED screw-in lamps that are a suitable replacement for the existing lamp wattage and the fixture/area application. These lamps will result in wattage reductions ranging from 23%-93% based on the existing technology being replaced. With a rated life of 1,500 hours for incandescent and 10,000 hours for CFL, the 25,000+ hour rated life of LED screw-in lamps will result in significant maintenance savings, too. CFL plug-in lamps will be replaced with LED plug-in lamps with similar energy and maintenance savings.

   Exterior -The existing exterior lighting system across all of the DCNR buildings are made up of HID lighting fixtures. These fixtures will be replaced with new LED fixtures that provide equal or better light levels, attractive return on investment (ROI), and maintenance reductions, while still providing high a quality product. Wattage reductions from these fixture replacements will range from roughly 50% to well over 70% across all fixture types. With rated life of 100,000+ hours compared to 10,000 hours of a HID lamp, these fixture replacements will see the most significant maintenance savings of any replacements or retrofits on the project. The color consistency and even distribution of light levels from LED compared to HID technology will also result in a much more secure and visually appealing environment for each exterior space.

Lighting Occupancy Controls
ESG recommends the installation of occupancy sensors in public spaces throughout the buildings. During our walk-through, we noted the lighting in individual spaces was fairly well controlled, but that significant savings could be generated by controlling the lighting with occupancy sensors in the common areas. The ESG energy analysis team has developed an occupancy sensor program for this proposal based on "Dual Technology" sensors which sense both motion and sound. ESG provided a facilities lighting upgrade to LED designed according to the following criteria:

- ESG specified superior product to maximize energy savings reduce maintenance requirements and provide the greatest warranty.
- ESG specified superior product to maximize Utility Rebate Incentives and provide the greatest life expectancy.
- This is a complete LED upgrade, with an exception to some places which already have LED retrofits.
- Standardized products utilized wherever possible in order to reduce inventory and ongoing maintenance costs.
- RFP specifications: Lighting levels shall be: Illuminating Engineering Society (IES) recommendations as maximum; and, 80% of IES standards as minimum. New fixtures shall be Energy Star rated.

The table on the following pages is a summary of the existing lighting conditions and the proposed solutions. A detailed lighting list can be found in the Appendix.

LIGHTING SUMMARY BY LOCATION

PARK AND BUILDING	EST. QTY.	EXISTING CONDITION	PROPOSED UPGRADE
CLEAR CREEK			
PARK OFFICE	55+	Linear 4' T12 fixture	Direct wire LED tube retrofit
		Incandescent screw in fixture	LED screw in lamps
		LED fixtures	No upgrade
MAINTENANCE BUILDING	40+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
WATER TREATMENT BUILDING	6	Incandescent screw in fixtures	LED screw in lamps
RESTROOMS, SHOWER HOUSES AND BATH HOUSES	50+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
CABINS	90+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
		HID fixtures	New LED fixture/LED retrofit
COOK FOREST			

PARK AND BUILDING	EST. QTY.	EXISTING CONDITION	PROPOSED UPGRADE
PARK OFFICE	40+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
WATER TREATMENT BUILDING	6	Incandescent screw in fixtures	LED screw in lamps
COOKS INN	80+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
BATH HOUSE	20+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
CABINS	60+	CFL screw in fixtures	LED screw in lamps
JENNINGS ENVIRONMENTAL CENTER			
ENVIRONMENTAL CENTER	100+	Linear 2' and 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
KEYSTONE			
VISITOR CENTER	140+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
MAINTENANCE BUILDING	30+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
PAVILION	20+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
BATH HOUSES AND SHOWER HOUSES	90+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
CABINS	140+	CFL screw in fixtures	LED screw in lamps
KOOSER			
PARK OFFICE	20+	Linear 2' T12 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
BATHROOMS	40+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
CABINS	180+	Incandescent and CFL screw in fixtures	LED screw in lamps
LAUREL HILL			
PARK OFFICE	70+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
MAINTENANCE BUILDING	40+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
WELL HOUSE	4	CFL screw in fixtures	LED screw in lamps
VISITOR CENTER	110+	Linear 4' T8 and T5 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps

PARK AND BUILDING	EST. QTY.	EXISTING CONDITION	PROPOSED UPGRADE
RESTROOMS	90+	Incandescent screw in fixtures	LED screw in lamps
COTTAGES AND LODGE	150+	Linear and U lamp 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
GROUP CAMPS	590+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
LAUREL RIDGE			
MAINTENANCE BUILDING	1	LED fixtures	No upgrade
LINN RUN			
PARK OFFICE	80+	Linear 2' and 4' T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
MAINTENANCE BUILDING	50+	Linear 2' and 4' T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
SHOWER HOUSE	15+	Incandescent and CFL screw in fixtures	LED screw in lamps
CABINS	50+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
MAURICE K GODDARD			
PARK OFFICE		LED fixtures	No upgrade
MAINTENANCE BUILDING		LED fixtures	No upgrade
WOOD SHOP	20+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
RESTROOM	70+	Incandescent screw in fixtures	LED screw in lamps
MCCONNELLS MILL			
MAINTENANCE BUILDING	50+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
MORAINE			
PARK OFFICE	60+	Linear U lamp, 2' and 4', T12 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
MAINTENANCE BUILDINGS	50	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
WATER TREATMENT BUILDING	40+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
RESTROOMS AND SHOWER HOUSES	30+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
BOATHOUSE AND FIRST AID STATION	20+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
CABINS	60+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
OHIOPYLE			
	250+	Linear 4' T8 fixtures	Direct wire LED tube retrofit

PARK AND BUILDING	EST. QTY.	EXISTING CONDITION	PROPOSED UPGRADE
MAIN OFFICE, EVIRONMENTAL CENTER		CFL screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
MAINTENANCE BUILDING	120+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
RANGER STATION	30+	LED fixtures	No upgrade
TRAIN STATION	15+	CFL screw in fixtures	LED screw in lamps
BATH HOUSES	80+	Linear 2' and 4' T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
CABINS	15+	CFL screw in fixtures	LED screw in lamps
OIL CREEK			
PARK OFFICE	30+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
MAINTENANCE BUILDING	50+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
TRAIN STATION	10+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
POINT			
PARK OFFICE AND MAINTENANCE	60+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
BATHROOM AND PUMP HOUSE	70+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
MUSEUM	500+	Linear 4' T12, T8, and T5 fixtures	Direct wire LED tube retrofit
		CFL plug in fixture	LED retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
PRESQUE ISLE			
TOM RIDGE ENVIRONMENTAL CENTER	680+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
		LED Exit signs	No upgrade
MAINTENANCE BUILDING	40+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
RANGER STATION	80+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
STULL INTERPRATIVE CENTER	20+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
MARINA AND BOATHOUSE	160+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
BATH HOUSES	70+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
PYMATUNING			
PARK OFFICE	40+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit

PARK AND BUILDING	EST. QTY.	EXISTING CONDITION	PROPOSED UPGRADE
		Incandescent screw in fixtures	LED screw in lamps
		Incandescent exit signs	LED exit sign
MAINTENANCE BUILDING	120+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
ENVIRONMENTAL LEARNING CENTER	70+	Linear 2' and 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
		Incandescent exit signs	LED exit signs
LAUNDRY, RESTROOMS AND BATHHOUSES	150+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
CABINS	120+	LED fixtures	No upgrade
RACCOON CREEK			
PARK OFFICE	70+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
MAINTENANCE AND CARPENTRY SHOP	100+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
WATER TREATMENT BUILDING	20+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
REC CENTER	20+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
		LED fixtures	No upgrade
LODGE AND CABINS	40+	CFL screw in fixtures	LED screw in lamps
RYERSON STATION			
PARK OFFICE	70+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
MAINTENANCE BUILDING	60+	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
WATER TREATMENT	2	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
PAVILION	7	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
CABIN	22	Linear 2' and 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
YELLOW CREEK			
PARK OFFICE	30+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
MAINTENANCE BUILDING	50+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps

PARK AND BUILDING	EST. QTY.	EXISTING CONDITION	PROPOSED UPGRADE
ENVIRONMENTAL LEARNING CENTER	30+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
BATHHOUSE	20+	Linear 4' T8 fixtures	Direct wire LED tube retrofit
COTTAGES AND YIRTS	50+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
FORBES FOREST DISTRICT FD#4			
OFFICE	110+	Linear 2' and 4' T12 and T5 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
MAINTENANCE GARAGES	320+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
GALLITZIN FOREST DISTRICT FD#6			
MAINTENANCE GARAGES	130+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
CLEAR CREEK FOREST DISTRICT FD#8			
MAINTENANCE GARAGES	60+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
COMPLANTER FOREST DISTRICT FD#14			
MAINTENANCE GARAGES	70+	Linear 4' T12 and T8 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
DCNR REGION 2 OFFICE			
OFFICE	100+	Linear 2' and 4' T12 and T5 fixtures	Direct wire LED tube retrofit
		CFL screw in fixtures	LED screw in lamps
MAINTENANCE BUILDING	50+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent screw in fixtures	LED screw in lamps
EXTERIOR – ALL PARKS			
EXTERIOR	70+	Linear 4' T12 fixtures	Direct wire LED tube retrofit
		Incandescent and CFL screw in fixtures	LED screw in lamps
		HID fixtures	New LED fixture/LED retrofit

2. Replace/install/upgrade HVAC Controls

During ESG's preliminary audits of DCNR's parks and buildings, we noted that many of the Park Offices, Visitor Centers, Learning Centers, and other administrative spaces did not utilize programmable thermostats or the programming features had been disabled. Programmable thermostats allow for the ability to program schedules based on the time of day and/or the week so that the HVAC systems maintain comfortable space temperatures when the spaces are in use. This allows for energy savings to be obtained by maintaining different temperature setpoints during unoccupied hours.

ESG recommends installing a seven (7) day programmable thermostats for Park Offices, Visitor Centers, Learning Centers, and other administrative spaces. These spaces are typically occupied between 7 AM and 5 PM with a few exceptions.

The new thermostats will be programmed to maintain the following temperature schedule.

TEMPERATURE SETPOINTS

Occupied Heating Setpoint	68° F
Un-Occupied Heating Setpoint	50° F
Occupied Cooling Setpoint	72° F
Un-Occupied Cooling Setpoint	80° F

3. Replace Pumps/Motors when applicable

Replacing old, inefficient motors and pumps that are greater than 5HP to high efficiency units is a good opportunity for energy savings. During our walkthrough we did not see any opportunity for pump or motor replacement. In locations where large pumps and motors greater than 5HP were located, the motor or pumps had already been replaced within the last 5 years or were a special application motor and replacement would not fit under the requirements of a small GESA.

d. Additional ECMs Recommended by ESG

1. Building Envelope and Building Weatherization Improvements

In buildings that are heated or cooled, significant energy losses can occur through poorly insulated walls, ceilings, and floors and through failing or missing seals around doors and windows. ESG noted locations at each park where seals and insulation can be improved. For locations where the spaces are heated and/or cooled, the following scope of work will be implemented:

- Use 2-part foam to seal roof-to-wall intersections.
- Install additional insulation on top of existing bat insulation adding R-Value.
- Replace and install weather stripping, sweeps, and astragals on single and double exterior doors.
- Use 1-part foam seal air leaks around windows, air conditioning units, and building penetrations.
- Replace and install weather stripping on garage doors.
- Install weather stripping and insulation around attic and roof hatches.

SUMMARY OF BUILDING ENVELOPE ITEMS
TO BE INSTALLED AT ALL DCNR REGION 2 PARKS AND FACILITIES
A detailed line-by-line descriptioncan be found in Appendix.

Existing Condition	QTY	UOM	Proposed Improvement
Worn out entry door weather stripping	520	each	Repair/replace weather strip on entry doors
Worn out entry door sweep	526	each	Install sweeps on entry doors
Existing roof wall gaps – interior	2915	ln ft.	Seal interior roof/wall intersection as part of compartmentalization
Worn out garage door weather strip	112	each	Replace garage door weather stripping
Missing or worn windows sealing	22,176	sq ft.	Seal exterior window perimeters

Existing Condition	QTY	UOM	Proposed Improvement
Missing or worn air conditioner sealing	3	each	Seal gaps around window air conditioner
Unsealed penetrations	21	SQ FT.	Seal penetrations at various locations above the drop ceiling and in mechanical rooms
Roof vents seal	4	each	Inspect and seal roof vents
Blown-in insulation	58,280	SQ FT.	Raise R-values using blown-in or loose fill insulation
Worn/missing astragal	46	each	Install new astrigal
Worn out double door weather stripping	48	each	Repair/replace weather strip on double doors
Worn out double door sweep	48	each	Install sweeps on double doors
Worn out and uninsulated attic hatch	10	each	Seal and insulate attic hatch

2. Install Instantaneous Tankless style Water Heaters
   Tank style storage water heaters use energy to maintain water temperature, even when there is not any hot water being used. Even tanks with very good insulation will need to energize to maintain the hot water temperature so that it's available when needed. Replacing these tank style water heaters with an instantaneous hot water heater will reduce standby losses associated with conventional tank style water heaters. Instantaneous water heaters energize as soon as there is a call for hot water and supply on demand.

ECMs REQUIRING FURTHER INVESTIGATION

1. Utilization of Existing Natural Gas Wells
   Presque Isle State Park and Keystone State Park have natural gas wells that could be utilized in each park. During the IGA, Energy Systems Group will investigate the possibility of utilizing these wells for heating fuel at those parks.

ECMS CONSIDERED BUT NOT RECOMMENDED

1. Water Conservation Measures. Most of the parks surveyed obtain water from on-site wells that is treated to the proper safety requirements. A survey of the current well water operations did not uncover any potential for savings at these parks. These parks also generally operate their own wastewater treatment plants. A survey of the current wastewater treatment operations did not uncover any potential for savings at these parks. The parks that utilize local municipalities for their water and sewer supply already utilize low flow fixtures and did not have any opportunity for savings.
2. Alternative Energy Sources. DCNR parks provide a good opportunity for the installation of alternative energy sources such as wind and solar power generation. However, the size of the systems required to provide benefit to DCNR will not fit into the maximum project size requirements of a Small GESA project.

2.3-2 Energy Audit

a. Proposal clearly and thoroughly describes the scope of the Energy Audit, including systems covered, personnel, methodology and schedule milestones

Energy System Group's Investment Grade Audit (IGA) will thoroughly investigate building systems, compile results, and provide comprehensive costs and savings analysis. Our investigation will detail the most cost effective measures in conjunction with any specific facility needs and goals to be included in the final list of recommended Energy Conservation Measures (ECMs). We will also include ECMs that were excluded due to underperforming economics so that DGS will understand all of the measures that were evaluated.

At the commencement of the IGA, ESG will request a building inventory list, obtain utility costs and other baseline information, and discuss the buildings and potential projects with park personnel. This study will include analyzing the applicable utility bills and rate schedules, and determining the appropriate incremental costs to be used in our savings analyses.

ESG will assemble a highly qualified team for the project from its staff and subcontractors. In addition to the subcontractors, the key ESG personnel that will have varied roles in the audit phase are Dan Khuu, Mike Lowery, Tony Prelec, Mahesh Bala and Scott Gracely. The subcontractors ultimately selected to assist with the facility audits and analysis will depend on the project size, key energy systems involved, and any preferences identified by DGS and DCNR. ESG will conduct the IGA, keeping in mind that the actual measurements obtained will be a critical part of the baseline and the Measurement & Verification (M&V) plan.

b. Proposal thoroughly discusses how the Proposer's approach to the Energy Audit will comply with DGS' Energy Audit format

ESG's systematic approach to implementing the detailed IGA includes a preliminary site visit to evaluate baseline equipment operations and conditions (Small GESA Project Design Manual - Chapter 2, Section 201). Following the preliminary survey, a list of existing conditions, including deficiencies or upgrades, are identified and a measurement and/or metering plan devised.

Short-term measurements, in combination with drawings, manufacturer's data, and ESG experience, are utilized to develop baseline energy budgeting for various building systems, such as lighting, cooling, heating, pumps and fans (Chapter 2, Section 201). The baseline energy budgeting is a critical step to establishing boundaries for realizable energy savings expectations through various ECMs. The total building energy use (utility bills or, in the absence of utility bills, calculated from benchmark data for similar facilities or systems) is then compared to the aggregate energy budget number to further validate the baseline values. ESG will adhere to all code and permitting requirements (Chapter 2, Section 202). If land surveys are required, ESG will adhere to requirements listed in Chapter 2, Section 203. Subsurface and related site investigations will be handled in accordance with Chapter 2, Section 204 and any design restrictions will be addressed according to the guidelines laid out in Chapter 2, Section 205.

c. Proposer clearly and thoroughly describes a reasonable and transparent approach to pricing the costs to prepare an Energy Audit for this project

ESG's approach to pricing the IGA is straightforward. We estimate the effort (man-hours) to perform all the necessary steps described above, the hourly rate for the individuals assigned, and any applicable per diem to develop a total projected labor cost for the IGA. Finally, we apply management labor, administrative labor, overhead and profit margin to determine the total cost of the IGA.

ESG is willing to share the cost breakdown with DGS prior to beginning the IGA to ensure agreement with the estimated man-hours and the time to perform the necessary functions. ESG's approach is totally transparent concerning pricing of the IGA for the PA Small GESA-4.

2.3-3 Costs

a. Degree to which the proposed energy analysis demonstrates sound engineering principles and the reasonableness of the proposed savings

ESG's Proposed cost savings for the Small GESA 4 Project reduces the baseline annual utility expenses by $219,696, or over 18 percent. This is well in line with our experiences at similar facilities.

ANNUAL UTILITY USE AND SAVINGS SUMMARY							
	Base		Post		Savings		% Energy Savings
Utility	Unit	Costs	Unit	Costs	Unit	Costs	
Electric	7,631,839 kWh	$ 990,225	5,587,582 kWh	$ 813,192	2,044,257 kWh	$ 177,033	26.8%
Heating Fuel	14,036,479 kBTU	$ 204,221	11,104,144 kBTU	$ 161,558	2,932,335 kBTU	$ 42,664	20.9%
Subtotal		$ 1,194,446		$ 974,750		$ 219,696	**18.4%**

b. Proposer established a reasonable cost for preparing an Energy Audit for this scope of work in compliance with the methodology discussed in the Cost Submission

Based upon the large geographic area in which DCNR Region 2 encompasses, ESG expects that the Investment Grade Audit (IGA) will take between 30-45 days at a cost of $32,500. This cost will be rolled into the funding for the project, providing DGS and DCNR agrees to move forward with the GESA project following IGA. If, after the IGA, DGS and DCNR decline to move forward with the overall GESA project, then ESG would bill the Commonwealth for the $32,500, cost of the audit, net 30 days.

c. Proposer provides annual financial projection for the length of the contract and each projection appears in the proper format listed in the RFP

The cash flow for Small GESA-4 is provided in this section. ESG guarantees that the total energy savings projected in final scope of work will be at least 95% of the savings projected in the proposal, and the actual ECM costs will be within 10% of the costs listed in the ECM Cost table. The project will be self-funding over the financial term of 12 years, per the RFP.

PENNSYLVANIA - SMALL GESA-4 DCNR

ENERGY PERFORMANCE CONTRACT CASH FLOW

Financials Updated	3/8/2017
Interest Rate (LLC)	**3.00%**
Loan Value	**$2,206,473**
Loan Repayment Period (yrs)	**12**
Payment Frequency	**Annual**
Energy Cost Esc./yr	1.0%
M&V Term (years)	**3**

	A	B	C	D	E	F	G	I	J	K
Starting Contract Years	Annual Energy Costs **without** Improvements	Annual Energy Costs **with** Improvements	**Annual Energy Cost Savings**	**Agreed-Upon Operational Savings**	**Total Including Guaranteed Savings**	**Payments for Financing equipment**	**Payment for monitoring and maintenance services**	**Net Annual Benefit**	**Cumulative Cash Flow**	**Net Present Cash Flow**
Agreed Upon Construction Savings			$ -	$ -	$ -	$ -	$ -	$ -		$ -
1	$ 1,194,446	$ 974,750	$ 232,120	$ -	$ 232,120	$ 215,211	$ 10,326	$ 6,583	$ 6,583	$ 6,583
2	$ 1,206,391	$ 984,498	$ 234,441	$ -	$ 234,441	$ 215,211	$ 10,635	$ 8,595	$ 15,178	$ 14,277
3	$ 1,218,455	$ 994,343	$ 236,785	$ -	$ 236,785	$ 215,211	$ 10,955	$ 10,620	$ 25,799	$ 23,718
4	$ 1,230,639	$ 1,004,286	$ 239,153	$ -	$ 239,153	$ 215,211	$ -	$ 23,943	$ 49,741	$ 44,184
5	$ 1,242,946	$ 1,014,329	$ 241,545	$ -	$ 241,545	$ 215,211	$ -	$ 26,334	$ 76,076	$ 65,829
6	$ 1,255,375	$ 1,024,472	$ 243,960	$ -	$ 243,960	$ 215,211	$ -	$ 28,750	$ 104,825	$ 88,550
7	$ 1,267,929	$ 1,034,717	$ 246,400	$ -	$ 246,400	$ 215,211	$ -	$ 31,189	$ 136,014	$ 112,252
8	$ 1,280,608	$ 1,045,064	$ 248,864	$ -	$ 248,864	$ 215,211	$ -	$ 33,653	$ 169,668	$ 136,842
9	$ 1,293,414	$ 1,055,515	$ 251,352	$ -	$ 251,352	$ 215,211	$ -	$ 36,142	$ 205,810	$ 162,235
10	$ 1,306,349	$ 1,066,070	$ 253,866	$ -	$ 253,866	$ 215,211	$ -	$ 38,655	$ 244,465	$ 188,349
11	$ 1,319,412	$ 1,076,731	$ 256,405	$ -	$ 256,405	$ 215,211	$ -	$ 41,194	$ 285,659	$ 215,108
12	$ 1,332,606	$ 1,087,498	$ 258,969	$ -	$ 258,969	$ 215,211	$ -	$ 43,758	$ 329,417	$ 242,439
TOTAL	**$ 15,148,571**	**$ 12,362,273**	**$ 2,943,860**	**$ -**	**$ 2,943,860**	**$ 2,582,527**	**$ 31,916**	**$ 329,417**	**$ 329,417**	**$ 242,439**

2.3-4 Measurement and Verification

a. Degree to which the proposed Measurement and Verification (M&V) plan adheres to all M&V protocol standards and demonstrates scalability for measurement and verification of the proposed energy baseline, adjustment factors and energy cost savings

Energy Systems Group (ESG) follows industry-accepted methods and approaches for measurement and verification associated with energy, operations and maintenance (O&M), and water projects. ESG complies with the International Performance Measurement and Verification Protocol (IPMVP), which is prepared and updated by the Efficiency Valuation Organization. ESG is currently utilizing the IPMVP, September 2010 in our GESA projects.

The IPMVP is widely adopted by national and regional government agencies, and by industry organizations, to help manage their programs and enhance the credibility of their implemented energy projects and reported results.

PROPOSED ENERGY BASELINE APPROACH

Our energy guarantees are based on a proven track record and a wealth of experience in establishing and calculating the customer's energy, water, and O&M baselines. We typically analyze up to three years of data to establish a true baseline.

One important aspect of establishing an energy baseline is to analyze the utility bills and energy-use profiles. Utility baseline profiles provide a foundational understanding of utility use and seasonal patterns. In turn, these patterns yield the potential ECMs and their realistic magnitude of opportunity for cost savings. Analysis of the electric demand, electric load factor, electric power usage, and gas usage during peak and lowest use months provides a wealth of knowledge to the trained eyes of ESG's energy engineers. The method utilized for determining energy savings within most of our projects is based on a model that starts with the utility bills, paired with the adage that "*you can't save what you aren't paying*."

Utility Cost and Usage Foundation

Once an energy baseline is established, we utilize a number of data gathering tools and processes to obtain all the relevant information required to calculate energy use (pre- and post-implementation) in order to assess the economic impact of recommended facility improvements. Such improvements are discussed in the remainder of this section.

We use similar data analysis techniques as it relates to water, O&M, and other project savings opportunities. Whether it is energy, water, or O&M opportunities we are evaluating, we work with our customers to obtain documented costs, rates, invoices, records, etc. and develop trend graphs and other analysis/reporting tools. ESG performs a thorough and detailed analysis of actual bills and invoices to profile client energy expenses, understand applicable rates and tariffs, unit pricing, and energy use.

Adjustments to Baseline Methodology

Proper analysis and comparison can only be achieved if the environmental and facility parameters are comparable to those of the base year. Examples of factors that affect the environment and facility parameters are weather, energy rates, facility schedules and changes in equipment.

b. Proposal clearly and thoroughly describes a reasonable and transparent approach to pricing the costs to measure and verify the guaranteed savings for the entire duration of the project

The pricing methodology utilized by ESG to determine the value of a M&V program for any Small GESA project is based on effort expended or value of resources utilized. Our typical nominal rates in Pennsylvania for personnel involved in measurement and verification are as follows:

Measurement and Verification Manager	$70.00 per hour
Energy Engineer	$95.00 per hour
Clerical	$45.00 per hour
Report Generator	$45.00 per hour

ESG estimates the manpower required to measure, calculate and report the savings based on factors such as type of ECMs, M&V protocol, number of meters and number of locations. For costing purposes, we also consider expenses such as travel, airfare, hotel, rental car, etc. for the staff. Once all these factors are calculated and costs are determined for the M&V program, Energy Systems Group applies 15% overhead and 10% profit to the costs to arrive at the total cost of the M&V program for each year M&V services are provided.

c. Proposal clearly indicates the M&V pricing is premised upon design and construction in compliance with DGS' Design Manual and General Conditions and also in compliance with the International Performance Measurement and Verification Protocol (IPMVP)

Our M&V program in Pennsylvania will follow all guidelines set forth in the DGS Design Manual, general conditions and administrative procedures, and the IPMVP.

As stated in Section b above, the M&V pricing is based on our estimated efforts for your given situation (i.e. types of ECMs and requirements of the PA Small GESA program).

Our guarantee ensures that ESG will pay any savings shortfalls, in full, directly to the customer. Any shortfall will be reconciled annually by ESG in an amount equal to the shortfall as calculated by the annual energy audit and accepted by our customer and their designated facilities representatives.

d. Proposal thoroughly describes the methods, schedule, scope and personnel who will be performing the Measurement and Verification

Measurement and Verification (M&V) is a vital component of any energy performance contract. ESG's M&V personnel will be involved with the project from conception to commissioning, and in every year of the contract term. M&V personnel are critical during the development phase to establish the most appropriate and cost effective M&V protocol. They play a crucial role in establishing corresponding plans and ensuring that post installation measurements are performed according to the chosen M&V protocol. Additionally, they ensure proper documentation and analysis of the measurements are performed. The Lead Engineer will serve as the contact point for M&V information and will utilize ESG's M&V resources to provide documentation that the installed systems are performing at or above the guaranteed levels. ESG's M&V team members have many years of M&V experience with applicable International Performance Measurement and Verification Protocol (IPMVP) standards.

The majority of our guarantees are based on utility bill comparisons (i.e., IPMVP Option C) and provide ongoing focus for our customers on operating their facilities in an energy-efficient manner. ESG guarantees energy savings using the most appropriate methodology for accuracy, customer risk mitigation and cost effectiveness. It is

common for guarantee contracts to use multiple methodologies and data collection techniques to arrive at the best process for each facility.

ESG's core competencies and focus are on providing our customers with "Building Upgrades That Pay for Themselves." A key activity of our partnership with our customers is the measurement and verification of savings results. Our customers have always received timely, accurate, and easy to understand documentation of the savings results.

M & V Personnel: ESG Lead Engineer Michael Lowery will serve as the contact point for M&V information and will utilize ESG's M&V resources to provide documentation that the installed systems are performing to the guaranteed levels. ESG M&V Manager, Donna Wicks has many years of M&V experience with applicable International Performance Measurement and Verification Protocols (IPMVP). She will oversee all M&V activities to ensure the plan is executed correctly. ESG has nine other professionally trained M&V experts whom are Association of Engineers Certified with Measurement and Verification professional credentials.

ESG's savings results for our customers have an average positive deviation of more than 10%, which clearly demonstrates our ability to accurately project and achieve the savings we guarantee.

Compliance with Customer Requirements: ESG will work with DGS to define a customized approach for M&V that best reflects the goals of the project, is accurate, is fair to both parties and is also helpful in maximizing savings results for the term of this performance contract.

M&V Schedule: ESG will work with DGS to define an M&V program and schedule that is a best fit for the ECMs chosen for the project.

Adjustment for Shortfalls and Windfalls: All savings above the project guarantee amount are entirely DGS' to keep. Each year's annual savings must meet/exceed DGS' debt service payments for that year. Any shortfall will be reconciled annually by ESG in an amount equal to the shortfall as calculated by the annual energy audit and accepted by customer representatives.

Regular Interval Post-Installation Verification: At regular intervals, ESG will verify that the installed equipment or systems have been properly maintained and are operating correctly. Although annual reports are required for establishing savings guarantees, reports should be prepared at least semi-annually to ensure systems are working properly, allowing for fine-tuning of measures throughout the year based on operational feedback.

Baseline development: The strength and foundation of all M&V reporting is the appropriate development of the baseline. For this response we have used the baseline data provided to us. However, upon selection, ESG will first begin a detailed review of utility bill data for the most recent three to four years of data.

Formal reports to Customer: We typically provide annual guarantee reconciliation report, however ESG can also customize the frequency as required by DGS.