Town of Petawawa

Corporate Energy Management Plan

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1. PURPOSE

The purpose of this plan is to identify the current situation of Energy Management for the Town of Petawawa and to set out clear goals for their improvement and an action plan to achieve these goals.

While the Town of Petawawa has initiated several energy efficiency projects that have reduced the overall energy consumption, the Ontario government's Green Energy and Green Economy Act has required an increase in the municipal energy management.

This results in the need to have a more formal structure in managing energy across the corporation and enhance current practices and develop new approaches.

2. APPROACH

This document has been developed to describe the elements of a Successful Energy Management Program. The framework and elements followed is based on NRCAN, ISO 50001 "Energy Management Systems", Energy Star – Guidelines for Energy Management and Industry Best Practice. The framework will provide the Town of Petawawa with a recognized framework to integrate energy performance into management practices. The framework is intended to accomplish the following:

- Lead the Town of Petawawa in making better use of their existing energy consuming assets
- Create transparency and facilitate communication on the management of energy resources
- Lead and execute several projects to reduce energy consumption, utilize cost effective energy streams and reduce greenhouse gas emissions.
- Promote energy management best practices and reinforce good energy management behaviour
- Promote the development of Champions with-in facilities for Energy Management Improvements as part of their Enhance Productivity and then lead the development and execution with the support of the facility.
- Provide a framework for promoting energy efficiency throughout the supply chain
- Allow integration with other organizational management systems such as environmental, and health and safety.

There are four vital pillars for a Successful Energy Management Program:

- **Top Management Support**
  - Make Commitment
- **Strategy Plan**
  - Assess Performance
  - Set Goals
  - Create Action Plan
  - Implement Action Plan
- **Monitoring System**
  - Evaluate Progress
  - Recognize Achievements
- **Technical Ability**

3. ENERGY MANAGEMENT PLAN OUTLINE – FOUR VITAL PILLARS

3.1 Top Management Support

Top Management shall make a commitment to allocate manpower and funds to achieve continuous improvement. To establish the energy management program, Town of Petawawa should:

- Council Endorsement
- Assign energy management responsibility
- Institute an energy policy

3.2 Strategy Plan

3.2.1 Assess Energy Performance

Understanding current and past energy use helps the Town of Petawawa identify opportunities to improve energy performance and gain financial benefit.

- Data Collection and Management
- Establish Baseline
- Benchmark
- Analysis and Evaluation
- Conduct Technical Assessments & Audits

3.2.2 Set Goals

Performance goals drive energy management activities and promote continuous improvement. Setting clear and measurable goals is critical for understanding intended results, developing effective strategies, and reaping financial gains.

- Determine Scope
- Estimate Potential Improvement
- Establish Goals

3.2.3 Create and Implement Action Plan

Once past performance has been assessed and the goals set, an Action Plan can be created. A detailed action plan is used to ensure a systematic process to implement energy performance measures. Unlike the policy, the action plan is regularly updated, most often on an annual basis, to reflect achievements, changes in performance, and shifting priorities.

- Define Technical Steps and Targets
- Determine Roles and Resources
- Create a Communication Plan
- Raise Awareness and Motivate

- Build Capacity

3.3 Monitoring Systems

3.3.1 Evaluate Progress

Evaluating progress includes formal review of both energy use data and the activities carried out as part of the action plan as compared to your performance.

- Measure results
- Gather tracking data
- Benchmark
- Review action plan

3.3.2 Recognize Achievements

Providing and seeking recognition for energy management achievements is a proven step for sustaining momentum and support for your program.

- Internal Recognition
    - Determine recognition levels
    - Individual / Team
    - Facility
    - Determine recognition type and action
- External Recognition

3.4 Technical Ability

Investments must be made in training and systems. Staff must have adequate technical ability for analysing and implementing energy saving options.

- Industry Seminars & Conferences
- Certified Director of Public Works
- Other Energy related training

4. ENERGY MANAGEMENT PLAN IMPROVEMENTS OUTLINE

4.1. Energy Improvements are limited to the following scope:

- Electricity
- Natural Gas
- Diesel (future)
- Water (future)

1. Process Improvements

Action	Description	Performance Measures	Lead	Estimated Completion
1.1 Operations:				
1.1.1 Develop a corrective maintenance program for Town Facilities	Develop a corrective maintenance program for all Town owned facilities. Components of the corrective maintenance program will be limited to HVAC, but will be expanded in the future.	Program created and implemented Addresses Vital Element 3.2.3	Director of Public Works	Q4 2014
1.1.2 Develop and implement a facility walk-through checklist to be used by facility managers	The walkthrough checklist will enable facility managers to optimize operations and use of mechanical equipment	Checklist created and completed on a regular basis – file in a central location Addresses Vital Element 3.2.3	Senior Staff	Future
1.2 Data Management:				
1.2.1 Receive electricity and natural gas billing information and track monthly	Receive and monthly input data from utilities into central database	Duty assigned to staff and tracking spreadsheet created Addresses Vital Element 3.2.1 and 3.3.1	Director of Public Works	Q2 2014
1.2.2 Create baseline	Create baseline with current data	Establishment of baseline Addresses Vital Element 3.2.1	Director of Public Works	Q2 2014
1.2.3 Determine gaps and create plan to address	Review the current data being gather and determine if there are any gaps. Create plan to address gaps and	Creation and implementation of plan Addresses Vital	Director of Public Works	Q4 2014

	additional data required for energy monitoring	Element 3.2.1		
1.2.4 Provide comprehensive energy data to senior management	Develop a process to report quarterly and annually the energy data to senior management	Number of reports issued Addresses Vital Element 3.2.3	Director of Public Works	Q3 2014
1.3 Energy Awareness:				
1.3.1 Develop an energy communication plan	The target audience of the communications plan include Town Council, Staff and community The purpose of the communications plan is to promote the Town's energy initiatives, energy use ad savings Established Energy Reduction Month "Turn out the lights" Challenge	Plan developed and communicated to all Addresses Vital Element 3.2.3	Director of Public Works	Ongoing
Develop Recognition Program	Develop clear recognition levels for Internal and External sources. Determine type and action	Number of persons / facilities recognized. Addresses Vital Element 3.3.2	Director of Public Works	Q4 2014
1.4 Resources:				
1.4.1 Add energy management under the responsible duties of the Director of Public Works	An identified gap in the organization is the need for a dedicated person to implement the energy management plan and coordinate energy initiatives in the Town	Director of Public Works role added to existing job description Addresses Vital Element 3.1	CAO	Q2 2014

2. Program Implementation

Action	Description	Performance Measures	Lead	Estimated Completion
2.1 Operations:				
2.1.1 Complete Facility Condition Assessments	Complete Facility Condition Assessments for all Town owned facilities.	Completion of all Assessments Addresses Vital Element 3.2.2	Director of Public Works	Future
2.1.2 Develop and implement operating procedures for applicable Town facilities	Develop operating procedures to optimize energy efficiency and usage at Town facilities Senior managers and staff will incorporate into their job function	Number of operating facilities developed and implemented Addresses Vital Element 3.2.2	Senior Staff	Future
2.2 Training:				
2.2.1 Implement training for identified staff on the Town's energy management plan	Provide training for staff on the implementation of the Corporate Energy Management Plan	Number of employees trained Addresses Vital Element 3.4	Director of Public Works	Q4 2014
2.2.2 Provide continual training for Energy Management Staff	Energy Management staff to attend one (1) training session or convention per year	Number of training sessions Address Vital Element 3.4	Energy Manger	Ongoing
2.3 Energy Planning				
2.3.1 Update the Corporate Energy Management Plan	Review and update the Corporate Energy Management Plan every five (5) years, with annual status updates. Receive approval and endorsement from Council and Senior Management	Update report to Council for endorsement Addresses Vital Element 3.1 and 3.3.1	Director of Public Works	Ongoing
2.3.2 Benchmark	Benchmark with similar Municipalities and Facilities Conduct one (1) benchmarking visit / activity per year	Number of Benchmark activities Addresses Vital Element 3.3.1	Energy Manger	Ongoing

3. Projects Implementation

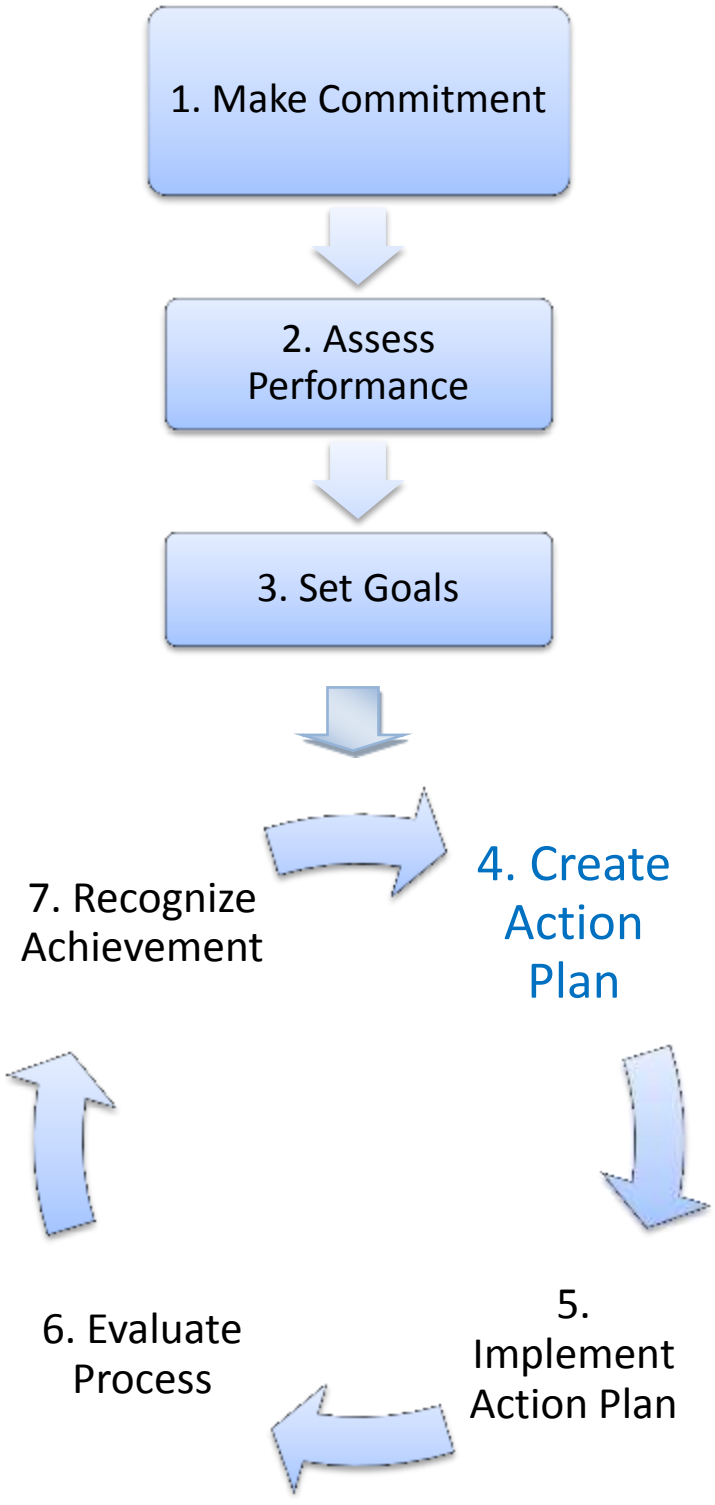
Action	Description	Performance Measures	Lead	Estimated Completion
3.1 Operations:				
3.1.1 Implement commissioning and recommissioning into facility maintenance program	Conduct commissioning and recommissioning at Town facilities Incorporate into regular facility maintenance program	kWh/cost saving realized from actions taken Addresses Vital Element 3.2.2	Director of Public Works	Future
3.2 Retrofits:				
3.2.1 Continue to implement mechanical and building system upgrades	Incorporate regular mechanical and electrical upgrades of system in Town facilities Implement energy efficient standards when replacing equipment	Number of system upgrades implemented Resulting impact on energy use & cost Addresses Vital Element 3.2.3	Senior Staff	Q4 2014
3.2.2 Partnership with utilities to ensure optimization of incentive funds	Network and communicate regularly with utilities on incentive programs	Amount of incentive funding provided by utilities Addresses Vital Element 3.2.2	Director of Public Works	On-going
3.3 Lighting:				
3.3.1 Convert old street lights	Convert or replace old street lights with new LED models Research replacing all Street Lights in one contract or systematically replacing a few a year LED (25 watts) vs HPS (150 watts)	Amount of Street Lights converts to LED Addresses Vital Element 3.2.3	Director of Public Works	Q4 2014

3.4 WTP and WWTP:				
3.4.1 Investigate and implement energy efficient project	Conduct Audits of the two facilities and implement project which demonstrate a return on investment of 8 years	Number of projects completed Resulting impact on energy use & cost Addresses Vital Element 3.2.3	Director of Public Works	On-going
3.5 Public Works Garage & Civic Centre:				
3.5.1 Investigate and implement energy efficient project	Conduct Audits of the two facilities and implement project which demonstrate a return on investment of 8 years	Number of projects completed Resulting impact on energy use & cost Addresses Vital Element 3.2.3	Director of Public Works Senior Managers	On-going

4.2. Recognize Achievements

- Internal Recognition – TBD.
- External Recognition – TBD.

Appendix A Energy Plan - Schematic



** In addition, there is a constant feedback loop to the top of the process for reassessment and Continuous Improvements.

Appendix B

Electricity

Table B-1
Electrical Consumption (MWh)

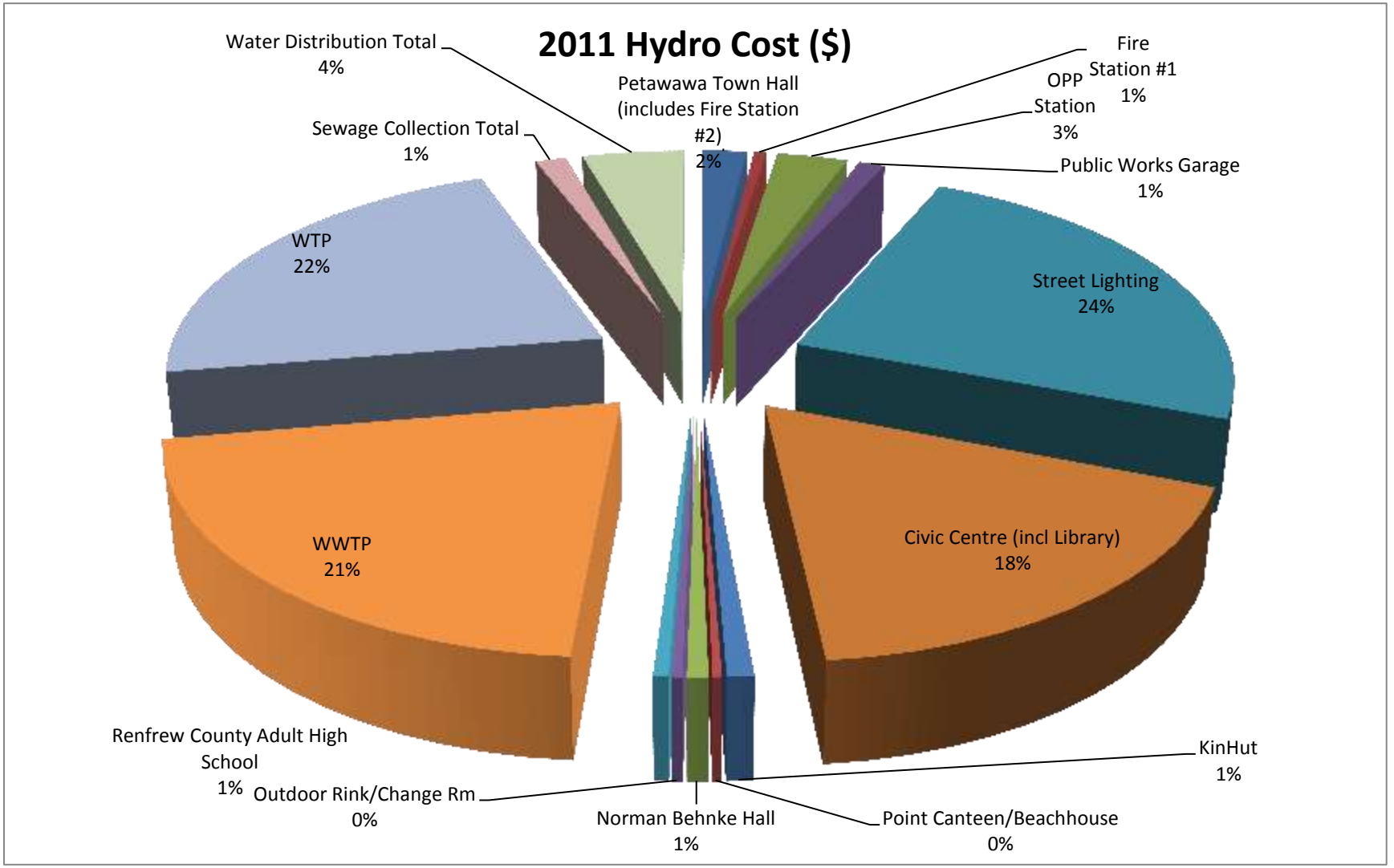
Facility	Address	2011 Hydro (kWh)	2011 Hydro Cost ($)	2012 Hydro (kWh)	2012 Hydro Cost ($)	2013 Hydro (kWh)	2013 Hydro Cost ($)
Administrative and Fire							
Petawawa Town Hall (includes Fire Station #2)	1111 Victoria Street	95,553	$ 11,421	95,027	$ 2,240	87,189	$ 11,701
Fire Station #1	23 Schwanz Rd.	77,457	$ 3,301	26,871	$ 4,132	27,763	$ 4,314
OPP Station	1913 Petawawa Blvd	131,223	$ 18,202	128,497	$ 19,170	120,166	$ 19,658
Public Works							
Public Works Garage	19 Industrial Dr.	45,754	$ 6,733	38,112	$ 6,087	33,281	$ 5,578
Street Lighting		957,440	$141,806	986,771	$159,123	896,115	$171,052
Parks & Recreation							
Civic Centre (incl Library)	16 Civic Centre Dr.	822,731	$103,983	834,611	$108,715	602,511	$ 82,509
KinHut	16 Civic Centre Dr.	42,588	$ 4,857	50,062	$ 6,022	34,824	$ 4,276
Point Canteen/Beachhouse	1073 Island View Dr.	3,5893	$ 1,645	3,105	$ 1,626	3,151	$ 1,577
Norman Behnke Hall	11 Norman Street	24,789	$ 3,804	27,508	$ 4,365	23,390	$ 3,881
Outdoor Rink/Change Rm	1913 Petawawa Blvd	7,268	$ 1,877	7,376	$ 1,936	8,806	$ 2,144
Renfrew County Adult High School	1064 Victoria Street	21,201	$ 2,737	20,512	$ 2,819	22,747	$ 2,763
Utilities							

WWTP	560 Abbie Lane	1,150,209	$124,909	1,105,137	$137,813	1,012,960	$133,753
WTP	270 Lieven Rd.	1,051,446	$128,867	1,108,626	$134,997	1,099,958	$187,477
Sewage Collection							
Harry Street Pumping Station	1 Harry Street	41,752	$ 3,822	39,940	$ 5,091	49,420	$ 6,438
Pet Beach East Pumping Station	Earl Street	11,937	$ 1,680	11,628	$ 1,630	11,084	$ 1,508
East Street Pumping Station	41 East Street	19,123	$ 2,013	15,625	$ 1,907	21,287	$ 1,606
Syphon Chamber	Albert Street	978	$ 334	1,012	$ 344	1,166	$ 293
Sewage Collection Total		**73,791**	**$ 7,849**	**68,207**	**$ 8,972**	**82,959**	**$ 9,845**
Water Distribution							
Water Tower		48,014	$ 6,599	48,061	$ 7,075	45,662	$ 7,230
Water Tower (DND)	Festuburt Road						$ 3,085
Water Booster Station #1	Brumm Road	42,652	$ 6,109	61,326	$ 9,260	40,440	$ 6,642
Water Booster Station #2 - Janet Street	2923 Petawawa Boulevard	99,594	$ 13,310	107,265	$ 15,250	94,683	$ 13,828
Water Distribution Total		**190,261**	**$ 26,019**	**216,652**	**$ 31,585**	**180,787**	**$ 30,785**

TOTAL		**4,695,304**	**$588,010**	**4,717,080**	**$639,603**	**4,236,613**	**$671,313**

- Forecast from National Energy Board and US Energy Information Administration - Oil 20% increase, Natural Gas 8.5% increase, Electricity 5% increase and Propane 5%

Figure B-1 Electrical Consumption (MWh)



Appendix D

Natural Gas

Table D-1
Natural Gas (m^3)

Facility	Address	2011 Natural Gas (m^3)	2011 Natural Gas Cost ($)	2012 Natural Gas (m^3)	2012 Natural Gas Cost ($)	2013 Natural Gas (m^3)	2013 Natural Gas Cost ($)
Administrative and Fire							
Petawawa Town Hall (includes Fire Station #2)	1111 Victoria Street	8,038	$ 3,115	9,221	$ 3,282	11,338	$ 3,847
Fire Station #1	23 Schwanz Rd.	5,972	$ 2,630	7,019	$ 2,947	6,416	$ 2,871
OPP Station	1913 Petawawa Blvd	3,630	$ 1,864	5,087	$ 2,279	5,615	$ 2,789
Public Works							
Public Works Garage	19 Industrial Dr.	17,044	$ 4,907	21,297	$ 6,095	25,985	$ 7,564
Street Lighting							
Parks & Recreation							
Civic Centre (incl Library)	16 Civic Centre Dr.	19,213	$ 6,578	20,675	$ 7,709	23,539	$ 9,192
KinHut	16 Civic Centre Dr.						
Point Canteen/Beachhouse	1073 Island View Dr.						
Norman Behnke Hall	11 Norman Street	3,151	$ 2,167	4,143	$ 2,441	4,422	$ 2,544
Outdoor Rink/Change Rm	1913 Petawawa Blvd						
Renfrew County Adult High School	1064 Victoria Street	4,246	$ 2,029	4,994	$ 2,245	2,948	$ 620
Utilities							

WWTP	560 Abbie Lane	43,821	$ 25,475		$ 26,171		$ 1,915
WTP	270 Lieven Rd.	69,408	$ 15,135	75,039	$ 15,354	75,035	$ 15,478
Sewage Collection							
Harry Street Pumping Station	1 Harry Street	1,608	$ 1,337	1,933	$ 1,509	1,573	$ 1,360
Pet Beach Est Pumping Station	Earl Street						
East Street Pumping Station	East Street						
Syphon Chamber	Albert Street						
Sewage Collection Total		**1,608**	**$ 1,337**	**1,933**	**$ 1,509**	**1,573**	**$ 1,360**
Water Distribution							
Water Tower							$ 2,605
Water Tower (DND)	Festuburt Road						
Water Booster Station #1	Brumm Road						
Water Booster Station #2 - Janet Street	2923 Petawawa Boulevard						
Water Distribution Total		0	$ -	0	$ -	0	$ 2,605

TOTAL		176,131.00	$ 65,237	149,408.00	$ 70,032	156,871.00	$ 50,784

- Forecast from National Energy Board and US Energy Information Administration - Oil 20% increase, Natural Gas 8.5% increase, Electricity 5% increase and Propane 5%

Figure D-1 Natural Gas Consumption (m^3)