



**HEALTHCARE**  
ENERGY  
LEADERS  
ONTARIO

# Conservation and Demand Management Plan

## Weeneebayko Area Health Authority Facilities



March, 2017



Submitted to:  
Weeneebayko Area Health Authority  
Moose Factory, Ontario

Submitted by:  
Canadian Coalition for Green Health Care  
Healthcare Energy Leaders Ontario  
[www.greenhealthcare.ca/HELO](http://www.greenhealthcare.ca/HELO)

## Executive Summary

The following Energy Conservation and Demand Management Plan is prepared for the Weeneebayko Area Health Authority (WAHA) by the HealthCare Energy Leaders team in accordance with sections 6 and 7 of the Green Energy Act, 2009, O. Reg. 397/11.

In October, 2010, the Weeneebayko Health Ahtuskaywin integrated with the James Bay General Hospital to form the Weeneebayko Area Health Authority (WAHA). At present, WAHA oversees the medical services and facilities of communities of Ontario's James Bay and Hudson Bay coastal regions. The Weeneebayko General Hospital in Moose Factory, the James Bay General Hospital in Moosonee, Fort Albany and Attawapiskat and the hospitals' associated agencies in the communities of Kashechewan and Peawanuck are committed to providing high quality health care within these Northern communities.

## Goals and Objectives

Our mission is to provide high quality health care as close to home as possible for the communities we serve. To continue to provide a holistic approach to health care and promote healthier lifestyles within the communities, we need to address to impact our facilities have on the environmental health and implement strategies to improve the environmental health of our communities and thus the public health.

## Introduction

The purpose of our Conservation and Demand Management Plan is to promote good stewardship of our environment and community resources. In keeping with our core values of providing high quality health care with a holistic approach catering to the distinct needs of all peoples in the Weeneebayko region, our energy management plan will aim to reduce our operating costs and increase our climate resiliency, while continuing to deliver high quality standards in every aspect of health care. The plan will also adhere to the requirements outlined in the Green Energy Act, 2009, O. Reg. 397/11.

To further strengthen and obtain full value from energy management activities, a strategic approach will be taken: WAHA will fully integrate energy management into its business decision-making, policies, and operating procedures across all facilities. The energy management program will ultimately result in reduced operating costs and enable the hospital to provide services to a greater number of persons in the community.

## Facility Surveys

In September 2016, the WAHA facilities were audited by the Canadian Coalition for Green Health Care’s HealthCare Energy Leaders – Ontario (HELO) Energy Auditor. The HELO team worked with a WAHA representative to investigate opportunities for energy conservation and climate change resiliency projects within the buildings portfolio in the communities of Attawapiskat, Fort Albany, Kashechewan, Moose Factory, Moosonee, and Timmins.

### Attawapiskat Facilities

The Attawapiskat Hospital is one of the three inpatient facilities offering acute care services in obstetrics, medical/surgery services, pediatrics, palliative care, and special care unit. The Attawapiskat Ambulance Base is one of the five bases operated by JBAS, which provides pre-hospital care and support services for WAHA’s First Response Team for surrounding communities.

Table 1 Attawapiskat Hospital, Ambulance Base, Nurses Residence and Hospital Housing facility information.

<b>Attawapiskat Hospital</b>	
Year Constructed:	1985
Address:	972 Riverside East, Attawapiskat, Ontario P0L 1A0
Square Footage:	19,403
Facility Use:	7 acute care beds, 8 CCC
<b>Attawapiskat Ambulance Base</b>	
Year Constructed:	2002
Address:	905 Maple Street, Attawapiskat, ON P0L 1A0
Square Footage:	4,880
Facility Use:	Emergency services
<b>Attawapiskat Nurses Residence</b>	
Year Constructed:	1974 and 1988 addition
Address:	988 Riverside Road East, Attawapiskat, ON P0L 1A0
Square Footage:	-
Facility Use:	Nurses accommodation
<b>Attawapiskat Hospital Housing</b>	
Year Constructed:	-
Address:	972 Riverside East, Attawapiskat, ON P0L 1A0
Square Footage:	-
Facility Use:	Residential residence

## Fort Albany Facilities

The Fort Albany facilities were modeled after the Attawapiskat facilities. Fort Albany Hospital is one of the three inpatient facilities offering acute care services in obstetrics, medical/surgery services, pediatrics, palliative care and special care unit. The Fort Albany Ambulance Base is one of the five bases operated by JBAS, which provides pre-hospital care and support services for WAHA's First Response Team for surrounding communities.

Table 2 Fort Albany Hospital, Ambulance Base, Nurses Residence and Hospital Housing facility information.

<b>Fort Albany Hospital</b>	
Year Constructed:	1987
Address:	5 Airport Road, Fort Albany, Ontario P0L 1H0
Square Footage:	21,212
Facility Use:	8 acute care beds, 9 CCC
<b>Fort Albany Ambulance Base</b>	
Year Constructed:	2005
Address:	250 Seventh Avenue, Fort Albany, ON, P0L 1H0
Square Footage:	4,880 square feet
Facility Use:	Emergency services
<b>Fort Albany Nurses Residence</b>	
Year Constructed:	1974 and 1988 addition
Address:	5 Airport Road, Fort Albany, ON, P0L 1H0
Square Footage:	-
Facility Use:	Nurses accommodation
<b>Fort Albany Hospital Housing</b>	
Year Constructed:	-
Address:	5 Airport Road, Fort Albany, ON, P0L 1H0
Square Footage:	-
Facility Use:	Residential residence

## Moose Factory Facilities

The Weeneebayko General Hospital (WGH) in Moose Factory, is the third facility providing inpatient treatment for acute care. The WGH receives patients from Fort Albany and Attawapiskat hospitals who require more complex care. Patients requiring additional care are transferred from WGH to Kingston General Hospital or Timmins District Hospital. The Moose Factory hospital is one of the five locations operating pre-hospital care through ambulance and First Response Team services.

*Table 3 Weeneebayko General Hospital and Moose Factory Hospital Housing facility information.*

Weeneebayko General Hospital	
Year Constructed:	1948, with major renovations completed in 2008
Address:	19 Hospital Drive, Moose Factory, Ontario P0L 1W0
Square Footage:	112, 969 (including out buildings)
Facility Use:	37 acute care beds
Moose Factory Hospital Housing	
Year Constructed:	1940s-1990s
Address:	Throughout community
Square Footage:	Approximately 150 housing units with varying square footages
Facility Use:	Residential residence

## Moosonee Facilities

The Moosonee Health Centre provides out-patient services such as the James Bay Community Mental Health Program, Community Counselors, dental services, and emergency services. The Ambulance Base is one of the five bases operated by JBAS in WAHA communities, which provides pre-hospital care and support services for WAHA's First Response Team for surrounding communities.

Table 4 Moosonee Health Centre, Ambulance Base, Administrative Building, and Hostel facility information.

<b>Moosonee Health Centre</b>	
Year Constructed:	1994, with major construction completed in 2012
Address:	5 Percy's Way, Moosonee, Ontario P0L 1Y0
Square Footage:	7,126
Facility Use:	Primary care
<b>Moosonee Ambulance Base</b>	
Year Constructed:	1993
Address:	78 Bay Road, Moosonee, ON P0L 1Y0
Square Footage:	2,443
Facility Use:	Emergency services
<b>Moosonee Administrative Building</b>	
Year Constructed:	1954
Address:	78 Ferguson Road, Moosonee, ON P0L 1Y0
Square Footage:	4,025
Facility Use:	NHIB administrative offices
<b>Moosonee Hostel</b>	
Year Constructed:	2010 (purchased), believed to be constructed in 1960's
Address:	6 Bay Road, Moosonee, ON P0L 1Y0
Square Footage:	-
Facility Use:	Patient residence

## Kashechewan Facilities

The Kashechewan Ambulance Base is one of the five bases operated by JBAS in WAHA communities, which provides pre-hospital care and support services for WAHA's First Response Team for surrounding communities.

*Table 5 Kashechewan Ambulance Base facility information.*

Kashechewan Ambulance Base	
Year Constructed:	2010
Address:	197 James Street, Kashechewan, ON P0L 1S0
Square Footage:	7, 546
Facility Use:	Emergency services

## Timmins Facilities

The Timmins Kapashewekamik Hostel is a split-level house that provides single or multi-night accommodation for western James Bay residents who must travel to Timmins District Hospital for medical treatment.

*Table 6 Timmins Kapashewekamik Hostel facility information.*

Timmins Kapashewekamik Hostel	
Year Constructed:	2005 (purchased)
Address:	3255 Airport Road, Timmins ON P4N 7C3
Square Footage:	-
Facility Use:	Patient residence



## Completed Energy Conservation Projects

WAHA has undertaken several energy management projects. Following the major renovations to the WGH facility in 2008, the WGH staff and management completed the following energy management projects at the facility:

- LED lighting retrofit of the outdoor lighting,
- LED light retrofit in interior laundry services room,
- Steam trap maintenance program (in progress),
- Repair of condensate return infrastructure,
- Installation of a summer boiler,
- PRV replacement,
- Interior lighting T8 retrofit underway as of March 2017.

WAHA has completed the following energy management projects at the Fort Albany Hospital facility:

- Upgrades to the computer server room,
- Installation of a domestic hot water system,
- Installation of oil tank farm and supply system.

The Moosonee Health Clinic has completed the following energy conservation measures;

- Installation of Geothermal Heating System,
- Retrofit of exit lighting with LED 'Green – Running Man' fixtures,
- Installation of occupancy lighting controls.

These projects have been successfully completed at these facilities, with positive results.

## Facility Energy Consumption

### Energy Supply Management

WAHA has contracted the ECNG to meter electricity consumption at the Moosonee and Moose Factory facilities, and metering for Attawapiskat and Fort Albany is provided through Hydro North. Oil is provided to facilities by either Harwood Oil or Paytahpun Oil.

### Energy Use in Facilities

Utilities supplied to WAHA consists of oil, and electricity. At this point, annual electricity consumption and annual oil consumption for the WAHA facilities has not been monitored for the same calendar across all facilities. To, establish the total annual consumption rate, consistent monthly oil and electricity consumption metering must be established for a full calendar year.

### Attawapiskat Facilities

The table below outlines the annual utility consumption for 2015 and ekWh equivalent for each energy source at the Attawapiskat facilities. The 2015 estimated electricity charge for Attawapiskat area was \$0.42/kWh. At this time, oil data has not been consistently metered for all facilities in the Attawapiskat area.

Table 7 2015 Annual utility consumption and ekWh equivalent for electricity and oil sources at Attawapiskat facilities.

Energy/Utility Source	Annual Consumption in Units	Annual Consumption (ekWh)
Electricity (kWh)	769,867.00 kWh	769,867.00
Oil (L)	Not available	Not available
Total Annual Energy Consumption:		

### Fort Albany Facilities

The table below outlines the annual utility consumption for 2015 and ekWh equivalent for each energy source at the Fort Albany facilities. The 2015 estimated electricity charge for Fort Albany area was \$0.40/kWh. At this time, oil data has not been consistently metered for all facilities in the Fort Albany area.

Table 8 2015 Annual utility consumption and ekWh equivalent for electricity and oil sources at Fort Albany facilities.

Energy/Utility Source	Annual Consumption in Units	Annual Consumption (ekWh)
Electricity (kWh)	733,780.00 kWh	733,780.00
Oil (L)	Not available	Not available
Total Annual Energy Consumption:		

## Moosonee and Moose Factory Facilities

The table below outlines the annual utility consumption for 2016 and ekWh equivalent of each energy source at the Moose Factory and Moosonee facilities, based on the ECNG. The estimated electricity charge rate for Moosonee and Moose Factory area was \$0.15/kWh. At this time, oil data has not been consistently metered for all facilities in the Moose Factory and Moosonee areas.

*Table 9 2016 Annual utility consumption and ekWh equivalent for electricity and oil sources at Moosonee and Moose Factory facilities.*

Energy/Utility Source	Annual Consumption in Units	Annual Consumption (ekWh)
Electricity (kWh)	3,645,106 kWh	3,645,106
Oil (L)	Not available	Not available
Total Annual Energy Consumption:		

## Additional Facilities

At this point, the annual utility consumptions for the Kashechewan Ambulance Base and Timmins Kapashewekamik Hostel are not available.

## Energy Benchmarking

From an energy benchmarking standpoint, it is important to be able to apply detailed energy accounting and benchmarking practices to ascertain how a facility is performing compared to its peer group and the industry standards. Determining WAHA's energy use compared to industry standards, can provide valuable insight into opportunities for energy efficiency improvement. For this to happen there needs to be an accurate history of monthly consumption numbers for electricity, and heating fuel across all WAHA's facilities. At this point, it is difficult to establish the annual consumption (ekBtu/ft<sup>2</sup>) for WAHA.

The 2007 industry average provided by Natural Resources Canada is 228.95 ekBtu/ft<sup>2</sup>, however this standard may not be comparable for Northern Ontario sites as it is estimated these facilities use up to 23% more energy to heat facilities on an area basis.

## Energy Use Index Analysis

The Energy Use Index (EUI) is a key metrics used in energy benchmarking to express the energy use per square foot per year. It is calculated by dividing the total energy consumed by the building in one year by the total gross floor area of the building. In general, a low EUI signifies a good energy performance. The Ontario Hospital Average EUI produced by the Natural Resources Canada in 2008 was calculated at 3.11 GJ/m<sup>2</sup>.

At this point, EUI is unknown for WAHA's facilities. To establish EUI, all energy use consumptions must be consistently metered for one calendar year. The EUI for WAHA's facilities could be weather corrected for comparison to the Ontario Hospital Average EUI.

## Greenhouse Gas Emission Reporting

Greenhouse Gas emissions are expressed in terms of equivalent tons of Carbon Dioxide. A large proportion of Ontario's Electricity from the grid is derived from low-GHG hydroelectricity, and nuclear power plants releasing minimal greenhouse gases. Reducing a facility's electricity draw through retrofitting lighting systems with LED lights will reduce the annual tons of CO<sub>2</sub> produced by the facility. To further reduce electricity GHG emissions, WAHA can install roof mounted PV systems to generate solar power for the facilities.

At this point, oil GHG emissions for WAHA cannot be determined without consistent metering at all facilities for one full calendar year.

*Table 10 Summary of available GHG emissions for WAHA facilities based.*

Facilities	Year	Utility Type	Units/Year	Tons of CO <sub>2</sub>
Attawapiskat	2015	Electricity (kWh)	769,867.00	139.4992231
		Oil (L)	Not available	Not available
Fort Albany	2015	Electricity (kWh)	733,780.00	132.9602905
		Oil (L)	Not available	Not available
Moosonee & Moose Factory	2016	Electricity (kWh)	3,645,106.00	660.4900006
		Oil (L)	Not available	Not available

## Portfolio Manager

The ENERGY STAR Portfolio Manager®, is an online tool to measure and track energy and water consumption, as well as greenhouse emissions. Once a facility has begun tracking using the service, Portfolio Manager will automatically benchmark the performance of one building or a whole portfolio of buildings relative to industry standards. In addition, Portfolio Manager® can be used to set energy use targets and compare energy conservation measures relative to similar buildings nationwide.

## Energy Management Vision

WAHA's vision statement is to 'distinguish itself as a provider of quality health services with a holistic approach that reflects the distinct needs of all peoples in the Weeneebayko region.'

Therefore, we consider our facilities an integral part of the communities of James Bay and Hudson Bay region. To continue to provide the highest quality services, our facilities must operate as efficiently and effectively as possible, thus resulting in our ability to direct more resources towards patient care. In addition, our emphasis on a holistic approach to health care will be improved when we create a healthier environment by reducing our energy footprint.

WAHA's energy management vision is to eliminate energy waste, wherever possible, through infrastructure improvement, policy and process changes, improved operations management, and embracing best practice and technology changes.

## Guiding Principles for Strategic Energy Management

WAHA's energy management plan will be guided by these principles:

**Taking A Strategic Approach:** By acting strategically, the WAHA can significantly improve its energy-related performance. Internalizing energy and utility management into our organization's every-day decision-making, policies, and operating procedures will help assure substantial and long-lasting reductions in energy use throughout WAHA facilities.

**Supporting Mission-Critical Goals:** Strategic energy management will directly support WAHA's mission-critical goals of providing high quality health care for the communities in James Bay and Hudson Bay. It will also help the facilities to optimize the healing and working environment; improve the hospital's financial bottom line by reducing unnecessary energy and utility costs; and optimize the capacity of existing energy systems to meet current and expanding operational needs. The impacts of WAHA's energy management efforts on those goals will be tracked and reported wherever possible.

**Pursuing Long-Term Change to Core Business Practices:** The core of a strategic approach is the consistent incorporation of energy and utility management into our organization's core practices and decision making, such as the strategic planning and budgeting processes. Change in energy-related business practice will cover all applications of energy management – new construction and major renovations, existing facility operations and upgrades, and economic analysis and procurement practices.

**Fostering Organizational Commitment and Involvement:** Executive and organizational commitment and involvement is critical to successful strategic energy management. WAHA's upper management will work with facility managers and other key staff to ensure that adequate organizational support and resources are provided to maximize the benefits of energy and utility management. Energy and utility management will be integrated into the strategic planning and capital budgeting processes.

**Obtaining Solid Economic Returns:** Energy management investments will yield solid economic returns that meet WAHA's expectations on Internal Rate of Return and Return on Investment. WAHA will apply consistent financial analysis methods that consider life-cycle costs that reduce total cost of facility ownership and operation.

**Using Available Resources and Assistance:** WAHA will use national, regional, and local sources of strategic, technical, and financial assistance to help achieve our energy management goals. These include programs through local distribution companies, the Ontario Power Authority, ENERGY STAR®, saveONenergy, the Canadian Coalition for Green Health Care, The Canadian Healthcare Engineering Society, and EnerCan.

## Business Case for Strategic Energy Management

Below are the central business arguments for WAHA's pursuit of strategic energy management.

### ***Strengthened Community Leadership and Environmental Stewardship***

Energy management is a visible, public commitment to the community and environment. Through aggressive energy management, WAHA can provide leadership in promoting sustainable communities, efficient business practices, and environmental stewardship. This is an excellent opportunity to provide leadership and reduce costs at the same time.

### ***Enhanced Healing and Working Environment***

In existing facilities, efficient operating practices improve patient as well as employee comfort with more stable air temperature, better indoor air quality, and lighting. By way of an example, recent research has found that daylight eases surgical pain and contributes to substantial savings in pharmaceutical costs.

### ***Improved Financial Health and Operating Cost Reduction***

Strategic energy management presents a highly leveraged opportunity to reduce operating costs and positively impact WAHA's bottom line. Dollars of operating cost savings directly improve the operating margin. Further, investments in energy projects typically have a lower risk of performance over time relative to other investments and savings from energy projects are easier to forecast reliably than savings or revenue increases expected from more variable types of investment.

### ***Optimization of Capacity to Meet Current and Expanding Operational Needs***

Energy efficiency optimizes overall equipment/system operation so that system capacity can be reclaimed for current and expanding operational needs. This "free capacity" can eliminate the need to add major new infrastructure is far less expensive.

## Proposed Energy Conservation Measures

The energy audit conducted at WAHA's facilities revealed several conservation strategies for the facilities. Energy Conservation Measure Summaries prepared for each facility provide annual energy savings, annual financial savings, CO<sub>2</sub> emission reductions, estimated cost of measure, estimated payback period, and estimated incentives. The CDM plan provides a summary of the proposed energy conservation measures to be implemented across all WAHA facilities.



## WAHA Facilities Proposed Energy Measures Summary

Table 11 Summary of proposed energy conservation measures for WAHA facilities. See Appendix I for WAHA facility reference numbers.

	Proposed Energy Conservation Measure	WAHA Facilities																	
		1	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
Interior Lighting Infrastructure Upgrades	Retrofit ceiling pot light fixtures with new LED lampping	x	x				x	x	x		x	x	x		x	x	x		
	Complete retrofit of existing 32W T8 lampping with 12W LED lampping			x	x	x		x	x	x		x	x	x		x			
	Complete retrofit of existing T12 lampping with LED lampping	x			x	x													
	Replace exit lighting with 1.2 watt LED lampping technology	x		x	x	x		x	x	x		x	x	x		x			
	Install occupancy sensor controls for lighting systems	x		x	x	x		x	x	x		x	x	x		x			
Exterior Lighting Infrastructure Upgrades	Complete retrofit of 100W exterior wall pack fixtures with 26W wall pack fixtures			x	x	x		x	x	x		x	x	x		x			
	Complete retrofit of 240W pole mounted fixtures with 80W LED pole mounted fixtures			x															
	Complete retrofit of recessed incandescent soffit lamps and porch lamps with 15W LED lamps							x				x							
Mechanical Infrastructure Upgrades	Install programmable thermostats		x		x	x	x		x	x	x		x	x	x	x	x		
	Install insulation on heating system pipes		x	x	x	x	x		x		x		x	x	x	x	x		
	Install timed controls for all exhaust systems and HRVs										x					x			
	Re-commission electric duct heaters					x					x					x			
	Complete steam trap audit	x																	
	Replace manual control valves with thermostatically controlled valves	x																	
	Install instantaneous hot water heaters	x																	
	Complete audit study of Outside Air and Heat Recovery Ventilator System												x						
	Re-pipe boiler system with injection loop and dedicated circulator								x				x						
	Complete coil cleaning of HVAC system	x																	
	Re-commission HVAC controls			x					x				x						
	Replace all fan and pump motors, and refrigeration compressors with ultra-high efficient equipment at end of life								x				x						
	Install low-flow faucet aerators		x		x	x	x		x		x		x		x	x	x		
Electrical Infrastructure Upgrades	Replace block heater receptacles with Smart block heater receptacles	x		x	x	x		x	x	x		x	x	x		x			
	Complete study of roof mounted PV system	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
	Retrofit refrigeration system to be based on air cooled condenser technology	x																	
	Retrofit existing walk in cooler with; ECM motors, floating heat pressure controls, new door seals, and/or air-cooled condensers								x				x						
	Purchase second generator	x																	
Building Envelope Infrastructure Upgrades	Upgrade exterior wall insulation and roof insulation values	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
	Retrofit windows with high performance windows	x							x				x				x		
	Replace weather-stripping and sweeps of man doors and overhead doors	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		
New Facility Construction Upgrades	Complete engineering study of Geothermal Heating System					x		x	x	x		x	x	x		x			
	Apply for High Performance New Construction incentive	x		x					x	x	x		x						
Facility Operation Upgrades	Consider sending staff to Building Operator Certification and Energy Management Training courses	x		x	x	x		x	x	x		x	x	x		x			
	Make changes to purchasing policy	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
	Develop standard practice of meter reading	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		

## Appendix I

Table 12 Proposed energy conservation measures WAHA facility reference numbers.

WAHA Facility Reference Number	WAHA Facility Name
1	Moose Factory Hospital
5	Moose Factory Hospital Housing
6	Moosonee Clinic
7	Moosonee Ambulance Base
8	Moosonee Administration Building
9	Moosonee Hostel
10	Fort Albany Hospital
11	Fort Albany Nurses Residence
12	Fort Albany Ambulance Base
13	Fort Albany Hospital Housing
14	Kashechewan Ambulance Base
15	Attawapiskat Hospital
16	Attawapiskat Nurses Residence
17	Attawapiskat Ambulance Base
18	Attawapiskat Hospital Housing
19	Timmins Hostel