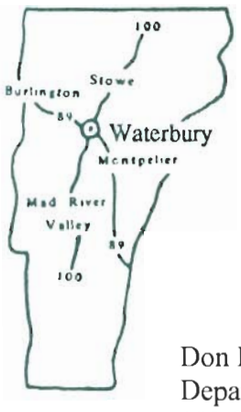

WATERBURY MUNICIPAL OFFICE

WATERBURY, VERMONT 05676
51 South Main Street • P.O. Box 9
(802) 244-7033 (802) 244-5858
FAX (802) 244-1014

January 26, 2009

Don Einhorn
Department of Environmental Conservation
103 South Main Street, West Office Building
Waterbury, VT 05671

Dear Mr. Einhorn:

I am writing on behalf of the entire Waterbury Selectboard to express our enthusiastic support for the application being submitted to for a Vermont Community Climate Change Grant by Waterbury LEAP (Local Energy Action Partnership), the Village of Waterbury, and the Town of Waterbury.

The volunteer members of Waterbury LEAP have been very active in recent years in helping our local residents, businesses and our municipality reduce emissions, increase energy efficiency, and consider renewable energy sources. We have been impressed with the various projects they have undertaken on behalf of our community.

In mid-2007, Waterbury LEAP approached Efficiency Vermont and arranged for an expert to perform energy efficiency audits of all Waterbury municipal buildings. Our community eventually received a summary of the expert's findings, and we learned dozens of steps we could take to become more energy efficient. Many of the recommended changes have already been made, but some have yet to be addressed due to the significant expenditures that would be required.

The Efficiency Vermont expert reported that Waterbury could save 1,125 gallons of fuel each year by upgrading the boilers in three municipal buildings: 1) the Town Library; 2) the Municipal Offices; and 3) the Village Water Treatment Plant. Given the challenging financial situation we all face, Waterbury would not be able to make these important upgrades without your grant.

The Waterbury Public Works Director, Alec Tuscany, is a strong advocate for increasing our community's energy efficiency, and he will do everything he can to ensure the upgrades of the three boilers are completed successfully.

Thank you for considering Waterbury's grant request. Please let me know if you have any additional questions.

Sincerely,

Rebecca Ellis
Chair, Waterbury Selectboard

VERMONT COMMUNITY CLIMATE CHANGE GRANT APPLICATION

1. **Project Title:** Waterbury Municipal Facility Boiler Replacement Project

2. **Applicant Name (include all partners):** Town of Waterbury: Waterbury Selectboard, Village Trustees, and Waterbury LEAP (Local Energy Action Partnership)

3. **Primary Applicant Address:** Post Office Box 9, 51 South Main Street
Waterbury, Vermont 05676

4. **Authorized Contact Name, Phone and Email:** Bill Shepeluk (Town Manager)
wshepeluk@waterburyvt.com (802) 244 - 7033

5. **Project Location:** Town of Waterbury: Municipal Offices, Town Library, and Waste Water Treatment Plant

6. **Brief Project Description (fifty words or less):** The Town of Waterbury intends to replace three old and inefficient boilers with new, energy-efficient boilers in three of its municipal buildings; the Town Offices, the Town Library, and the Waste Water Treatment Plant.

B. PROJECT WORK PLAN AND BUDGET

The project includes the replacement of old and inefficient heating systems with new, significantly more energy-efficient heating systems at three municipal facilities in the Town/Village of Waterbury:

- Town Library
- Town/Village Municipal Office Building
- Village Wastewater Treatment Plant (WWTP) Control Building

The Town/Village Public Works Director will serve as municipal project manager (MPM). Working with the current municipal heating contractor, Bourne Inc., the MPM will select the specific heating system components, define the scope of work, and develop a cost estimate for each municipal facility.

Prior to the heating contractor ordering materials and equipment and commencing work the MPM will review the scopes of work and cost estimates with the Municipal Manager. The Municipal Manager will present the project scopes of work and cost estimates to the Town of Waterbury Board of Selectmen, Village of Waterbury Trustees and Village of Waterbury Water/Sewer Commissioners for final approval. Both the Selectboard and the Village Trustees offered initial approval of the project and pursuit of the grant proposal at the January 22nd joint meeting.

The MPM will represent the Town/Village of Waterbury during the project, complete all required paperwork, review heating system component submittals, provide periodic inspection of the work, review and recommend approval of invoices, review change orders if needed and observe commissioning of each facility's new heating system.

No State permits (electrical, plumbing, or Fire & Safety) are required since the work involves replacement of existing systems with equivalent sized heating systems. No local permits are required since no exterior or interior physical changes are planned in any of the three municipal facilities.

Project Timeline

The proposed project can be completed in 3 to 4 months.

Week 1 &2

MPM and Bourne, Inc confirm scope of work, boiler/burner selection, ancillary components, and cost estimate for each municipal facility. Orders placed at end of week #2.

Week 3,4,5,6
Boiler/burner and ancillary components ordered and delivered.

Week 7,8,9
Boiler/burner systems installed. Assume one week for each municipal facility.

Project Budget

Municipal Facility	Equipment Cost	Installation Cost	Total Cost
Library	$4,000	$4,000	$ 8,000
Municipal Office Building	$3,000	$3,000	$ 6,000
WWTP	$2,500	$2,500	$ 5,000
	Total Project Cost		**$19,000**
	VCCCG Grant		**$12,000**
	Local Share		**$ 7,000**

As shown above, Local Share is $7,000 which represents 36.8% of the total project cost therefore meeting the 10% minimum local share requirement.

Contact Information:
Public Works Director (MPM)
Alec Tuscany, P.E.
Tel 802-241-4129
Cell 802-373-8710
Fax 802-244-1014
EMAIL-publicworksdirector@waterburyvt.com

Municipal Manager
William A. Shepeluk
Tel 802-244-1010
Cell 802-839-6235
Fax 802-244-1014

EMAIL-wshepeluk@waterburyvt.com

Bourne's Heating Fuels & Service, Inc
Marvin Bourne
17 North Main Street
Waterbury, VT
802-244-8667

1. Measurable reductions in energy consumption and/or greenhouse gas emissions

In 2007 Waterbury LEAP and the Town and Village of Waterbury requested Efficiency Vermont to conduct an energy evaluation of Waterbury municipal facilities. Included in the Efficiency Vermont Energy Evaluation Report were recommendations to consider replacing existing heating system boilers in the Town Library, Village Wastewater Treatment Plant (WWTP) Control Building, and the Municipal Office Building.

Location	Existing Condition	Recommended Upgrade	Estimated Cost (Boiler/Burner)	Approximate Annual Savings
Library	75% Efficient	87% Efficient	$4000	375 gallons
	200 MBH	200 MBH		
	Steam Boiler	Steam Boiler		
WWTP	70% Efficient	87% Efficient	$2500	250 gallons
	110 MBH	110 MBH		
	Boiler	Boiler		
Municipal	75% Efficient	87% Efficient	$3000	500 gallons
Offices	144 MBH	144 MBH		
	Boiler	Boiler		
			Est. Fuel saved/year:	**1,125 gallons**

These fuel saving estimates will vary on use but will be able to be evaluated over time based on comparisons with energy bills from previous years.

2. Transferability

One of the most effective efforts in the reduction of carbon emissions is the investment in increasingly efficient technologies. As data and evidence from projects like these increasingly become available locally to residents and businesses, and regionally to other

towns, the positive results will increase the likelihood that additional similar infrastructural improvements will be made by families, businesses and municipalities.

Bill Sheleluk, Waterbury Municipal Manager, and Alec Tuscany, Waterbury Public Works Director, will inform colleagues from other Vermont communities of the results of this equipment upgrade, and the impact this investment had on Waterbury's fuel usage.

Waterbury LEAP is recognized as one of the most active and effective town energy committees in all of Vermont, and it has completed many local energy efficiency projects since 2007. Among other roles, LEAP serves as a networking and information-sharing group in Waterbury focused on energy conservation. Members of LEAP frequently reach out to the community, attend conferences, and host events specifically geared towards sharing information and providing opportunities that businesses, individuals and municipalities may benefit from as they pursue energy conservation.

LEAP, in coordination with the Town of Waterbury, will follow up with this project to share the savings realized and the process taken to successfully complete the project. It will do so through several venues:

- Annual Waterbury Energy Efficiency Rally (175-200 attendees)
- Waterbury Town Fair
- In local newspaper articles (e.g., *Waterbury Record, Valley News*)
- At environmental conferences throughout the state (in 2008 Waterbury LEAP leaders spoke at three statewide conferences)
- In addition to this, the 70+ LEAP members will share results of this project through their involvement in conservation commissions, energy groups, schools and the other various networks represented by LEAP members.
- Through the marketing efforts of the Waterbury Energy Coordinator (a part-time position, to be hired by LEAP in late summer, 2009)

3. Viability of project approach

Upon receiving the energy audit report from Efficiency Vermont in 2007, the Town of Waterbury began implementing projects outlined as potential steps for energy conservation. By mid 2008, the Town of Waterbury had changed out all of the lighting in the town buildings as outlined in the audit report. Next on the list of projects in order of energy efficiency improvements was the replacement of boilers in 5 of the town buildings. Of the 5 buildings and boilers on the list, 2 of the buildings (the fire stations) will likely be torn down and rebuilt within the next few years making the investment in boilers for these buildings a short-term investment and not suitable for this grant request. The remaining three buildings will likely utilize any heating system for the life of the system and as such

will maximize the return on energy efficient technologies. The expected return on these boilers in terms of energy and dollar savings makes this step practical and necessary for the Town of Waterbury. The implementation of this project, as outlined in the Work Plan, is fairly straight forward. The success of this project is ensured by the strong support of project by the governing bodies and the proven effectiveness of the person in charge of managing the project, Alec Tuscany.

The Context of the project: The Town of Waterbury

Waterbury has its eye on utilizing new energy sources and energy conservation behavior, but must invest in our existing technologies to improve energy efficiency. By making this investment to ensure our buildings are more efficient we will maximize the potential return of future energy saving projects. The innovative nature of this project lies in the town's willingness to pursue practical, effective measures to save energy and dollars, to lay down a strong secure foundation for a community dedicated to the goal of reduced energy consumption and the projects that goal requires. The coordination with Waterbury LEAP will ensure dissemination of information related to the project's success to residents and towns and expand the benefits of the project beyond the walls of the buildings to be improved.

The community of Waterbury is a diverse community in respect to political and economic standing, but the community comes together on conservation of energy, fiscal responsibility and stewardship of the environment. These ideals are represented well in the long list of goals outlined in the Energy, Transportation, Natural Resources and Land Use sections of the Town Plan. Through outreach efforts by LEAP and the town, Waterbury residents will be reminded of the responsibility and positive steps the town has taken to respond to the increasingly threatening environmental and economic climate. The residents will benefit from reduced greenhouse gas emissions, dollar savings, and the evidence that is mounting that Waterbury is truly a "green" town. Moreover, any town residents and employees who use the Town Library, Village Wastewater Treatment Plant (WWTP) Control Building, and the Municipal Office Building will be ensured more reliable and energy efficient heating systems.

4. Cost-effectiveness

Next to electricity, the burning of fuel by the boilers in Waterbury's municipal buildings results in the greatest addition of green house gases to the atmosphere. Having already changed out all of the light bulbs in the municipal facilities and improving their electrical efficiency, the next step is to improve the fuel efficiency of the buildings. According to the Efficiency Vermont energy audit, the estimated fuel savings resulting from this project are 1,125 gallons per year. At an estimated $3/gallon, the town would save $3,375/year and $33,750 over the course of 10 years, and would avoid the purchase of 11,250 gallons of fuel

over the next decade.

Some other options were considered, such as replacement of the boilers in the existing fire stations and contribution to the photovoltaics on a new fire station design. The replacement of the boilers in the existing fire stations was decided against because of the uncertain timeframe for the replacement of the stations. The photovoltaics project, though innovative and highly visible, was not pursued because of rescission of the bond vote funding the construction of the fire stations.

5. Public Education and Involvement

Waterbury LEAP and the Town of Waterbury coordinated with Efficiency Vermont in 2007 to have audits performed for all of the municipal facilities in Waterbury. The results of those audits have been reviewed and available to LEAP members for quite some time. During the course of LEAP meetings since 2007 many municipal projects have been considered including improvements to street lighting, capture of methane from the land fill, and wind or solar demonstration project at the school among others. The selection of the Waterbury Municipal Facility Boiler Replacement Project is the result of this long term conversation and its selection was closely tied to the documentation and support identified in the Efficiency Vermont energy audit.

Upon learning of the grants that may be available to the towns, LEAP approached Alec Tuscany, the Public Works Director in the town of Waterbury to feel out the potential of the Town to pursue this project and to identify other projects. Ultimately, the boiler replacement project was determined have the greatest potential benefit and be the most feasible at this point in time. The project has been enthusiastically supported by Alec Tuscany and at subsequent meetings by the Town Manager, Bill Shepeluk, and all members of the Waterbury Selectboard, and the Village Trustees.

During the replacement of the three boilers, and after the project is completed, LEAP will inform local residents, business owners, and municipal employees about the project's progress and success. We hope this example will encourage others to make similar upgrades in their homes and facilities. We will communicate this news through articles in local papers, e-mails, and communications at town-wide events (e.g., the Waterbury Town Fair, the Waterbury LEAP Energy Efficiency Rally).

D. ATTACHMENTS

1. For municipal entities, attach a resolution of the governing body authorizing the application.

2. In the space below, list all other attachments that are being submitted in support of this application.

A. E fficiency Vermont energy audit
B. Selectb oard letter of support

ATTACHMENT A

July 23, 2007

Mr. Alec Tuscany, P.E.
Public Works Director
Waterbury Municipal Office
PO Box 9
Waterbury, VT 05676

Re: Efficiency Opportunities for Waterbury Municipal Buildings.

Dear Alec:

I'm writing to summarize my energy evaluation of the Waterbury municipal. We looked at the building envelope, lighting and heating systems for the Municipal Offices, Village Fire Station, Library and Town Fire Station. In addition I've also included the information from our visits to the Highway Garage, Water Treatment Plant (WTP) and Waste Water Treatment Plant (WWTP). This letter summarizes the site visits and includes possible efficiency upgrades that would reduce the buildings' energy consumption.

Village Fire Station:
This is a 1950's masonry building, asbestos interior wall panels and little if any insulation in the walls. The building heating is provided by a 1970's vintage 420,000 BTUH oil fired furnace in an attached room off the back of the building. There are (2) 275 gal fuel tanks that per Fire Chief Garry Dillon are filled approximately 1 to 2 times per week in peak heating season.

Based on discussions with Chief Dillon, the occupants are doing their part to operate the building as efficiently as they can. Since the space is largely unoccupied the heating is set back to 64°F and all lighting is turned off. The truck bay area utilizes paddle fans that are interlocked with the furnace to force the warm air down to the occupant level when the heating system is on. The upper level is also kept at a lower temperature when the space is not used.

I understand the town is trying to determine how much longer this station will be operational and that this will have an impact on the level of investment for energy efficiency improvements. The building envelope, heating system and lighting can all be improved upon.

Envelope:
There were apparent cracks in the exterior walls where daylight could be seen. As you know, you can save fuel and improve occupant comfort when buildings are properly weatherized. The station is already having new double paned windows installed and part of this installation should include caulking around the window frame to make an air tight seal. This alone will help reduce the infiltration of outside air into the building. If you were interested in doing a complete building weatherization the first step is to have a full building energy audit using advanced diagnostic techniques and equipment to pinpoint current air leakage and building insulation levels. Once the evaluation is complete, select a contractor to seal the leaks and increase insulation levels in the spaces that are the most cost-effective to improve. Full weatherization can save 15-30% on a building's annual fuel bill with an average of 22% savings. However this is a significant investment if you don't plan to operate this building for a long period of time.

Heating System:
There are a few of ways the efficiency of this system can be improved, one of which the occupants are already doing. Utilizing unoccupied temperature set back is a great way to obtain savings without significant investment. The general rule for savings is for every degree you set the temperature back over an 8 hour period, you save one percent of your annual heating bill.

Performing annual service and cleaning on the furnace will improve the efficiency of the existing equipment. You could also consider replacing the furnace with a newer more efficient model; again, depending on the duration of time this building will continue to be operational will determine the cost effectiveness of replacement. Assuming that the existing furnace is only 70% efficient and replacing it with an 87% efficient model the expected savings are listed in Table 1.

Lighting:
The current T12 (1 ½ inch diameter bulb) linear fluorescent lighting throughout the building can be replaced with a new linear fluorescent fixture called High Performance T8 (1 inch diameter bulb) lighting. Savings and incentive information for replacing the current 21, T12 fixtures with high performance T8 fixtures, assuming 2,000 hrs/yr of operation, is listed in Table 1. The new lighting fixtures would also improve the lighting quality in the building.

Old Street Garage and Small Truck Garage & Office:
The primary opportunity in these two buildings would be to replace the T12 lighting with High Performance T8 lighting. The savings would not be significant since the use hours in these spaces are very low.

<u>Municipal Office:</u>
This building is wood frame residential construction on a field stone foundation with slab on grade basement floor. You believe there to be minimal fiberglass batt insulation in the above grade walls. We observed both 6" batt insulation plus maybe 4" of blown-in cellulose insulation in the attic space over the town clerk and police station area. The basement has no surface insulation but you did mention that you'd had obvious openings through the foundation spray foamed to seal them against both water and air infiltration. The building is heated with hot water base board with a 144,000 BTUH boiler in the basement and a (1) 275 gal fuel oil tank in the basement. Frequency of tank re-fills was unknown.

Envelope:
This building could benefit from installing spray foam insulation on the interior surface of the foundation walls. This will provide both thermal benefits and reduce the potential for surface condensation on the wall and therefore reduce moisture issues in the basement. The savings for adding R15 foam with an approximate surface area of the foundation wall at 1,800 sf is listed in Table 1.

The existing windows are single pane double hung with storm windows only on the upper portion of the window. If you were able to have storm windows installed on the lower portion of the window as well this would also assist with the thermal integrity of the building.

Heating System:
Recommendations for this heating system are the same as those for the Village Fire Station. Assuming that the existing boiler is 75% efficient (since it's a bit newer) and a new boiler at 87% efficiency, estimated savings data is listed in Table 1.

Lighting:
There were many incandescent lamps (bulbs) in this building, primarily in the basement. Simply replacing these with compact fluorescent lamps (CFL's) is recommended. CFL's use 1/3 of the energy of an incandescent lamp and they last 10 times longer.

This building also uses T12 linear fluorescent fixtures in the conference rooms and office areas. Savings for upgrading these to High Performance T8 lamp and ballast combination fixtures are listed in Table 1.

Vending Machine:
There is a beverage vending machine in the upstairs conference room. Refrigerated vending machines use about $300 a year in electricity. You can install a controller called "VendingMiser" on a vending machine and, depending on the use of the building; you can save almost half of the energy use on the vending machine. The controller uses an infra-red sensor to sense occupancy and then cycles the cooling and lighting in the vending machine accordingly. It also has a function that can cycle the machine in 1 to 3 hour intervals. The Vending Miser costs about $180 and Efficiency Vermont offers a rebate of $45 per controller.

New Office Equipment:
As you replace office equipment be sure to specify ENERGYSTAR certified printers, faxes, copiers, computers, mailing machines, scanners, external power adapters and monitors. This equipment can save 40-70% of the electricity used over non-ENERGYSTAR models and the printers, faxes and copiers will save paper through automatic 2-sided print modes.

Power management for existing computers and monitors:
ENERGY STAR Power Management, standard in Windows and Macintosh, features place inactive monitors and computers (CPU, hard drive, etc.) into a low-power sleep mode. A touch of the mouse or keyboard "wakes" the computer and monitor in seconds. Monitor power management (MPM) can save $10 to $30 per monitor annually by placing your inactive monitors into a low-power sleep mode and Computer power management (CPM) places inactive computers into a low-power sleep mode, which can save $15 to $45 per desktop computer annually.

Library:
The library is combination of brick and wood frame construction. Based on our discussion there is very poor if any insulation in the walls and roof. The windows are single pane double hung with storm windows only on the top half. The librarian Mary Kasamatsu indicated that it's almost impossible to keep the building perimeter spaces warm enough to use in the peak of the heating season.

The heating system in this building is a steam system with each of the radiators in series. This means that each radiator down the line gets a little less heat than the one before it. The challenge with this system is there isn't really any individual space control without turning down individual radiators. The boiler is served by (1) 275gal fuel oil tank, re-fill frequency unknown.

Envelope:
To address the comfort issue in this building and since this building is occupied "full time" and is likely to be in use for the foreseeable future I'd recommend a full building energy audit using advanced diagnostic techniques and equipment to pinpoint current air leakage and building insulation levels. Once the evaluation is complete, select a contactor to seal the leaks and increase insulation levels in the spaces that are the most cost-effective to improve. Again, full weatherization can save 15-30% on a building's annual fuel bill with an average of 22% savings.

Heating System:
It's likely that due to the age of this heating system that the space temperatures that the system was originally designed to maintain have increased and therefore the system is having trouble keeping up with the current demand. In addition the minimal insulation causes high heat loss. By performing a full weatherization on the building the heating system may then be able to meet the building's heating load. In addition regular maintenance and cleaning will keep the boiler efficient. The boiler tag was no longer attached to the boiler so capacity information was unavailable. However, I assumed that the existing boiler maybe slightly larger than that used in the municipal office building, so assuming 200 MBH and 70% efficient and a new boiler at 87% efficiency, estimated savings data is listed in Table 1.

Lighting:
As in the other buildings the library also uses T12 linear fluorescent fixtures. Upgrade to High Performance T8 lamp & ballast combination fixtures is recommended; savings and incentive values are listed in Table 1.

Domestic Water:
During the walkthrough we noted a 2.75gal electric domestic water heater in the basement under the bathroom area. There are a couple of issues with this heater; one is that it was powered using an extension cord rather than hard wired to the building power with the cord resting on the damp basement floor. The other consideration is that since it's a bathroom with a hand sink and no shower I'd recommend an instantaneous heater rather than one with any storage. The current heater is constantly keeping the 2.75 gallons hot even when the building is unoccupied and instantaneous heater only uses power when the hot water is used.

New Office Equipment:
Same recommendations as are noted for the Municipal Office

Power management for existing computers and monitors:
Same recommendations as are noted for the Municipal Office

<u>Town Fire Station:</u>
This station building is a prefabricated metal panel building with steel frame. There is significant metal rot along the base of the building as water from the roof is not directed away from this area. The building is heated with a 227,000 BTUH propane fired furnace.

Envelope:
If possible cutting the bottom few feet of the exterior metal panels and retrofitting with new sections would increase the integrity of the building shell and reduce the infiltration of outside air into the building. I recommend consulting with a general contractor to investigate this possibility.

Lighting:
This building uses T12 linear fluorescent fixtures. However preliminary analysis indicates that due to both the low usage and low number of fixtures it would not be cost effective to upgrade this lighting.

Heating System:
Again the best recommendation for the existing system is regular maintenance and cleaning to improve the efficiency of the furnace. Assuming that the existing furnace is only 70% efficient and replacing it with an 87% efficient model the expected savings are listed in Table 1.

Waste Water Treatment Plant:
This is a wood frame 1978 building and it is assumed that it has typical batt insulation in the walls and attic. The building is heated with the original HB Smith oil fired hot water boiler. The boiler tag did not clearly indicate how many sections this boiler had but 3 sections was 75 MBH capacity and 4 sections would be 109 MBH. This boiler is close to its expected life of 30 years and would likely benefit from replacement. If this boiler were replaced with a new oil fired boiler the expected efficiency would be 87%, a standard propane boiler would provide efficiency closer to 90%. Assuming that the existing boiler is only 70% efficient and replacing it with an 87% efficient model the expected savings are listed in Table 1.

The building also makes use of a window air conditioning unit. The current unit efficiency is 9.8 EER this is fairly typical of a standard unit. Higher efficiency ENERGY STAR units are available and when replacing or purchasing widow unit it is recommended to look for the ENERGY STAR label.

Lighting:
Since this location already uses standard efficiency T8 lamps and fixtures and has fairly low annual use hours it is not cost effective to upgrade these fixtures. However, if a renovation of this space is planned at some future date the fixtures could be upgraded at that time.

Water Treatment Plant:
It was noted that the building was built in 1991-92 with masonry construction and 2" continuous rigid wall insulation per the design documents. The windows appeared to be double pane, metal frame type. The Control Room and office areas are served by a 2 ton, approximately 11.3 SEER/9.5 EER, Carrier heating and air conditioning unit with 56 MBH propane fired furnace section at 80.2% AFUE (efficiency). The main plant area is served by a dehumidification unit and propane fired Reznor forced hot air 120 MBH heating unit which also serves the chemical room and shop areas.

The emergency generator only runs 1/week for testing purposes, however when looking at the outside air/combustion air damper for the generator it was noted that it was not closed tightly. It wasn't clear if this was intentional for summer ventilation or if the damper needed adjustment to close properly. During the heating season and when the generator is off it is recommended that this damper close tightly to avoid running the space unit heater more than necessary. The damper is equipped with blade and jamb seals and insulated wall sleeve as is appropriate for our climate.

Heating & Air Conditioning:
At this time replacing the heating and air conditioning equipment is not recommended as it would not be cost effective as the equipment is only 2/3's through it expected life. As it fails and needs replacement I recommend contacting Efficiency VT to determine the minimum

recommended equipment efficiencies to qualify for incentives. To maintain the efficiency of the units I do recommend annual maintenance of all of the HVAC equipment including cleaning of the gas furnaces, filter changes, refrigerant charge check, and economizer cycling to verify operation. It is important to note that for the Carrier unit that serves the control room and offices, that the efficiency of this unit is dependent on matched indoor and outdoor components. Therefore if only one component fails you may want to consider replacing both indoor and outdoor units at the same time, to insure total system efficiency.

Lighting:
As in most of the municipal buildings the WTP also uses T12 linear fluorescent fixtures. Cost savings and incentive information to upgrade these fixtures to a High Performance T8 (HPT8) fixture is listed Table 1.

Highway Garage:
This is a large high bay structure for truck storage and maintenance. The building was constructed in 1990's and is a steel frame metal building with "sag & bag" insulation.

The building has hot water heat with a 1998 HB Smith 250MBH oil fired boiler. The boiler service both the radiant slab and the domestic water uses of the building. There are also 4 paddle fans in the high bay space for circulation.

Heating:
Again the best recommendation for the existing system is regular maintenance and cleaning to maintain the efficiency of the boiler. Assuming that the existing boiler had been maintained on an annual basis it is still 80-82% efficient replacing it at this time would not be recommended since the boiler is only 1/3 through its life expectancy. When replacement is required standard propane fired boilers would produce a slight gain in efficiency 87-90% however a propane fired condensing boiler would provide efficiencies in the 90%+ range. Condensing boilers are more costly, due to materials of construction, than standard boilers and operate with lower discharge water temperatures. Therefore if the town were to consider a condensing boiler for this facility it would be recommended to have an engineer review the design parameters of the system to ensure proper sizing of the boiler for this system.

Lighting:
The existing lighting fixtures are a mixture of 400W metal halide for primary lighting and standard T8 linear fluorescent for task lighting. Upgrading the metal halide fixtures to High Output T5 (T5HO) high bay fixtures has a number of benefits in addition to cost savings:

- T5 fixtures are 25-45% more efficient than the metal halide
- No inconvenient slow startup and long re-strike time of metal halides, which promotes leaving the MH's on even during low use times
- Can utilize multi-level switching of the lamps in each fixture or multi-circuiting of the fixtures so you can have only a few fixtures on during low use times

Below is a chart indicating the efficiency upgrade incremental cost, annual savings and the approximate incentives associated with each. As discussed the costs listed below are only the incremental increase between a standard efficiency option and the high efficiency option, not the total cost of the project. (For example the **difference** or **delta** between a standard T8 and a high performance T8 fixture, not the total cost of fixture and installation) Note incentives are only applicable for actual installation of options. The values in the table are only estimates for

budgeting purposes, actual project/equipment costs should be obtained from contractors and suppliers.

TABLE 1.						
Location	**Existing Condition**	**Recommended Upgrade**	**Estimated Incremental Cost**	**Approximate Incentive**	**Approximate Annual kWH savings**	**Simple Payback Period**
Village Fire Station	T12 Fluorescent (industrial strip)	High Performance T8	$1,000	$600	2,000	1.6 years
Village Fire Station	70% Efficient 400 MBH Furnace	87% Efficient 400 MBH Furnace	$4,000 (boiler/burner cost)	None available through EVT	1,200 gallons	N/A
Municipal Offices	Un-insulated stone foundation	R15 Spray Foam Insulation	Need contractor quote	None available through EVT	200 gallons	N/A
Municipal Offices	T12 Fluorescent (industrial strip)	High Performance T8	$900	$375	4,000	1.0 year
Municipal Offices	75% Efficient 144 MBH Boiler	87% Efficient 144 MBH boiler	$3,000 (boiler/burner cost)	None available through EVT	500 gallons	N/A
Library	T12 Fluorescent (industrial strip)	High Performance T8	$900	$400	3,600	1.0 year
Library	75% Efficient 200 MBH steam boiler	87% Efficient 200 MBH steam boiler	$4,000 (boiler/burner cost)	None available through EVT	375 gallons	N/A
Town Fire Station	70% Efficient 300 MBH Furnace	87% Efficient 300 MBH Furnace	$3,000 (boiler/burner cost)	None available through EVT	665 gallons	N/A
WWTP	70% Efficient 110 MBH Boiler	87% Efficient 110 MBH boiler	$2500 (boiler/burner)	None available through EVT	250 gallons	N/A
WTP	T12 Fluorescent (industrial strip, vapor tight & troffer)	High Performance T8	$3,000	$1,500	4,822	3 years
Garage	400W Metal Halide (MH) & Std. T8 (industrial strip & troffer)	High Output T5 High Bay for the MH and High Performance T8 for the Std. T8	$1,800	$900	9,244	1 year

Next Steps:
There are several opportunities for Waterbury to save money on operating costs through reduced energy use. Below are recommended next steps to move forward.

1. Lighting: If the town is interested in replacing lighting in some or all of the buildings and has the funding to do so, the next step would be to get an electrical contractor to provide their opinion on what type of lighting should be installed in all of the buildings and to get an estimate of the costs. If you then provide this information to Efficiency VT we can provide feedback and incentive information to aid the town in budget and project decisions. If the town does not have the funding for the lighting, there may be a way to lease the fixtures and pay for the lease cost through the energy savings. If you are interested in leasing, please let me know and I can provide more information.

2. If you would like to pursue building weatherization you can speak with Central Vermont Community Action Council who sometimes performs both the full building energy audit and weatherization (air sealing and insulation). They are located in Berlin and their phone number is (800) 639-1053. There would be a fee associated with their work. There are also for profit weatherization companies. If you would like a list of those companies, please let me know.

Efficiency Vermont has cash flow tools that can be used to help with budget planning to show how these projects would impact monthly cash flow. This would require us to spend time putting together more detailed cost information, but if the town is committed to making a project happen we are happy to help you.

Please let me know how I can help you with any next steps to reduce Waterbury's energy consumption. I am available to present this report to your select board and assist with prioritizing options. As you choose to proceed with specific projects we can refine the estimated incentives to let you know exactly how much you could expect for rebates from Efficiency Vermont.

Sincerely,

Amy KC Patenaude, P.E.
HVAC & Refrigeration Market Coordinator
888-921-5990, Ext. 1167

CC: File

E. APPLICANT REPRESENTATIONS AND SIGNATURE

The applicant(s), by signing and submitting this application, make(s) the following representations with the understanding that the Department of Environmental Conservation will rely on these representations for the purpose of evaluating this application. The applicant(s) understand(s) and acknowledge(s) that should any of these representations be untrue, the Department may rescind any award of assistance and, in the Department's sole discretion, pursue any other appropriate remedy or relief:

1. All information contained in this application, including attachments, is true and complete to the best of the applicant's knowledge and belief;
2. The applicant(s) has read and understands the grant background and guidance and grant terms and conditions and agrees to comply with them;
3. The primary applicant is a Vermont municipal entity or a non-profit organization, and if a non-profit, is in compliance with all requirements for maintaining its non-profit status; and
4. The applicant(s) will be ready to proceed with the project within 60 days of notification of the award.

NAME OF PRIMARY APPLICANT: Town of Waterbury, Vermont

NAME OF PARTNER: Waterbury Local Energy Action Partnership

AUTHORIZED SIGNATURES

PRIMARY APPLICANT: 1/30/09
William Shepeluk (Town Manager)

PARTNER: 1/30/09
Duncan McDougall (Co-Director LEAP)

PARTNER: 1/30/09
Keith Thompson (Co-Director LEAP)