

**GREENHOUSE GAS EMISSIONS REDUCTION FUND
Final Project Report Form**

1. Program Title (as displayed in your proposal)

Rochester, New Hampshire Municipal Wastewater Treatment Facility
Replacement of Aeration Blowers
Vendor No. 177467

2. Program Type (as listed in your proposal)

Category 5, Energy efficiency related industrial process and control systems.

3. Summary of work completed through the **duration of the grant.**

Task 1

Design the overall system for the replacement blower.

This task included the sizing and selection of the blower model; the identification of mechanical structural and electrical modifications that would be required to install the new blower; and the design of those modifications. The blower selected as the design basis is a Siemens model KA5SV-GK200.

Though not specifically design related, a power monitoring program was performed in December of 2010 to obtain base-line data for the existing positive displacement type blower.

There were no problems encountered during this execution of this task.

This task is 100% complete.

Task 2

Perform necessary system modifications for piping, control systems and structural support.

This task was complete by Apex Construction and included:

- The removal of sections of existing inlet and discharge piping to allow the new blower piping to be installed,
- The installation of the new blower piping,
- The installation of new conduit and wiring for power and controls,
- The installation of new structural supports for the new blower piping

Materials removed during this task were salvaged as scrap metal and sent to an approved metals recycler.

During the execution of this task, it was determined that there was a conflict between the record drawings for the facility and actual field conditions. The discharge piping was identified as 14-inch on the record drawings. During the installation of the new blower piping, it was determined that the connection point, approximately 15 feet above the finish floor, was actually a section of

12-inch pipe. A 12-inch by 14-inch stainless steel reducer was fabricated and the new piping was installed with this modification.

This task is 100% complete

Task 3

Remove one existing constant speed positive displacement blower.

This task was complete by Apex Construction and included the removal of the existing PD blower, motor and frame. These materials were salvaged as scrap metal and sent to an approved metals recycler.

There were no problems encountered during this execution of this task.

This task is 100% complete

Task 4

Install the new blower.

The new blower compressor was factory tested to confirm that the unit would meet the necessary volume and pressure requirements. The compressor was then sent to Missouri for final assembly where the compressor and motor were mounted to the frame. The control panel was constructed and also mounted to the frame and all interconnecting control and power wiring and monitoring components were installed. The full skid was then factory tested to ensure full functionality of all components.

The blower skid was then shipped to the project site where it was then disassembled from the skid to allow installation in the blower room. Disassembly was required due to spatial constraints at the project site. This work was performed by Siemens (Turblex) factory personnel with the assistance of Apex Construction.

The new blower was installed, all piping and wiring connections were completed and the blower was then tested in place to ensure functionality of all components. City staff were then provided training by Siemens technicians. The blower was placed into operation and has been running since June 23, 2011.

The power monitoring program that was done in December of 2010 was replicated in July of 2011 to establish the differential in energy use between the positive displacement blower and the new centrifugal blower. The results of this monitoring program are included as Attachment I. As presented in this attachment, the amperage draw for the positive displacement blower was approximately 240 amps, and the amp draw for the new high efficiency centrifugal blower is 140 amps.

This task is 100% complete

Through the execution of the project there were no deviations from the work plan, and there were no delays.

Benefits to all sewer users in Rochester, including low income residents, will be the reduction in energy use required to operate the aeration system. This will result a reduction in the overall operations and maintenance budget for the facility.

4. Summarize the overall project completed

This project replaced an inefficient positive displacement aeration blower with a high efficiency aeration blower at the City of Rochester’s wastewater treatment facility. This project has resulted in a reduction in energy consumption by approximately 42% for the aeration blower.

5. Please document any jobs created.

No full time jobs were created as part of this project.

6. Explain any obstacles encountered or any milestones not reached.

All milestones were reached. As with any retrofit construction project, minor changes to the design were required to address field conditions.

7. If applicable, in a section labeled Beyond the Contract (or some other well defined title), please report other activities, partnerships, funding or other synergies that have occurred as a result of this funding.

Please refer to Attachment I, *Rochester, NH Field Power Monitoring Evaluation Report*. This report documents a 42% reduction in energy required to operate the aeration blowers.

8. If applicable, please include brochures, pictures, announcements, or other materials developed to promote your grant activities. Attachments (and other documentation) are appreciated.

9. Budget vs. Actual Expenditures: Using the budget you submitted for the final approved grant proposal, please add a column and provide actual expenditures as well as match dollars to show how funding was spent.

Program Cost

Item	Original Budget	Grant Disbursement	Actual Cost	City Matching Funds	Payee
Design	\$ 45,000.00	\$ 50,000.00	\$60,000.00	\$10,000.00	Brown & Caldwell
Blower Purchase	\$218,600.00	\$220,610.00	\$441,220.00	\$220,610.00	Siemens
Construction	\$130,400.00	\$123,390.00	\$172,676.45	\$49,286.45	Apex Construction
TOTAL	\$394,000.00	\$394,000.00	\$673,896.45	\$279,896.45	

See Attachment II for supporting documentation.

10. Based on the results of your project, what additional steps are you now taking that you would have not otherwise taken had you not received the grant? Please be specific and provide details.

A second high efficiency centrifugal blower was installed as a backup to the blower installed under the grant. This provides the City with complete redundancy and allows the City to discontinue the use of the positive displacement blowers.

11. If you plan any press activities to announce your project, we would greatly appreciate the opportunity to attend.

At present, no press activities are planned, but should the City elect to do so, we will keep the PUC informed.