

US EPA ARCHIVE DOCUMENT

**State Innovation Grant Project
Narragansett Bay Commission
Progress Report – 12
July 1, 2011 – September 30, 2011**

Project Title: Sustainable Energy Management Practices for Wastewater Treatment Facilities

Part 1 – Synopsis of Accomplishments

During the current Project Reporting Period July 1st through September 30, 2011 the following activities took place: the Project Partners (NBC, RIDEM, URI, National Grid, RIMES and EPA) continued to meet and participate on conference calls to discuss and plan activities associated with project development and implementation, NBC continued collecting energy use data from RI WWTFs for benchmarking, work on investigating the potential use of biodiesel glycerin as a wastewater treatment carbon source, NBC's Pollution Prevention Engineer continued to research renewable energy opportunities for RI WWTFs with a focus on solar energy applications and continued working with URI to investigate alternative sources of anaerobic digester feed (waste) materials to help improve biogas production, NBC and National Grid completed Technical Assessments of 11 WWTFs and planned a Phase II Technical Assessment process, and NBC worked on reformatting of the FOG-ERP Workbook for distribution to local restaurants.

Part 2 – Summary of Activities Accomplishments

I. WWTF Energy Focused Environmental Management System Project

EF-EMS Steering Committee

Throughout the Project Period (July 1, 2011 – September 30, 2011) the EF-EMS Steering Committee coordinated efforts with Rhode Island Office of Energy Resources (RIOER) to make additional ARRA funds available for Energy Efficiency Technical Assessments (TAs) and Wastewater Treatment Facilities Energy Efficiency Upgrades. NBC will be seeking approval from the RIOER to utilize \$23,000 in ARRA grant funds remaining from the first round of 11 TAs to pay for ½ the costs of conducting additional TAs of potential energy efficiency projects at participating RI WWTF. The other ½ of the TA costs will be provided by National Grid. The Phase II studies will include:

- Bristol - Solids handling
- East Providence - Pump station
- Fields Point - Bisulfite Building
- Fields Point - Pump Station
- Newport - Solids Handling
- South Kingstown - Pump stations and Solids Handling
- Warwick – Pump Stations
- West Warwick – Head-Works and Solids Handling
- Westerly – Pump Stations

Energy Audits/Scoping Studies and Technical Assessments

Throughout the last project period the following activities took place regarding organizing and coordinating on-going and future Energy Efficiency Technical Assessments:

- On Tuesday, August 9, 2011, NBC’s ESTA P2 Engineer attended a meeting at RIDEM regarding POTW Technical Assessments and RIOER ARRA Energy Grants
- On Monday, August 15, 2011, NBC staff met with USEPA Region 1 at NBC regarding Technical Assessments and Energy Grants
- During the month of August, 2011, NBC’s pollution Prevention Engineer worked with Eric Studer of TNZ to complete the Fields Point and Bucklin Point Energy Efficiency Technical Assessments
- On September 29th NBC ESTA Staff and Engineering staff met with National Grid and TNZ Energy Management to discuss Technical Assessments of Washington Park and Bucklin Point.
- On September 28th ESTA staff met with representatives from RIDEM, National Grid and the RIOER to discuss the second round of RIOER Grant funding. Three projects were awarded funding during this round – NBC did not receive any of these funds

To-date Scoping Studies and/or Phase I Technical Assessments have been conducted of the following WWTFs:

Facility	Date	Energy Team Leader
Jamestown WWTF	July 1, 2009	Action Energy
Narragansett WWTF (Scarborough)	July 14, 2009	Action Energy
Bucklin Point WWTF	July 22, 2009	Action Energy
QPDC WWCP	August 25, 2009	NBC
Burriville WWTF	February 23, 2010	DMI
Smithfield WWTF	March 10, 2010	DMI
Cranston WWTF	March 24, 2010	DMI
South Kingstown	April 7, 2010	DMI
Quonset Point	April 21, 2010	DMI
Newport	April 28, 2010	DMI
Warren	May5, 2010	DMI
East Greenwich	May 12, 2010	DMI
Bucklin Point	May 19, 2010	DMI
Jamestown	May 26, 2010	DMI
Westerly	June 9, 2010	DMI

Facility	Date	Energy Team Leader
West Warwick	June 16, 2010	DMI
East Providence	July 8, 2010	DMI
Bristol	May 2011	TNZ-TA
Bucklin Point WWTF	May 2011	TNZ-TA
East Providence	May 2011	TNZ-TA
Jamestown	May 2011	TNZ -TA
Scarborough	May 2011	TNZ -TA
Smithfield	May 2011	TNZ -TA
South Kingstown	May 2011	TNZ -TA
West Warwick	May 2011	TNZ -TA
Westerly	May 23, 2011	TNZ -TA
Woonsocket	May 2011	TNZ -TA
New Shoreham	June 29, 2011	TNZ -TA

Water Environment Federation Water and Energy Conference

On August 1st 2011 NBC's Environmental Program Manager presented a poster and Power Point presentation on the EF-EMS Project for the 2011 WEF Water and Energy Conference in Chicago.

North East Bio-solids and Energy Conference

Through the current Project Period NBC's Pollution Prevention Engineer prepared a presentation on Bucklin Point's Biogas Combined Heat and Power Project to be given at the North East Bio-solids and Energy Conference in Seekonk, MA.

ARRA Energy Efficient for Wastewater Treatment Facilities Grant Program

In August 2011, NBC's Pollution Prevention Engineer submitted six grant applications to Rhode Island Office of Energy Resources requesting a total of \$330,780 for the following energy efficiency and renewable energy studies and projects:

Round 2 Grant Project Description	Project Cost	ARRA Grant Requested	Other Incentives Requested	Annual Energy Savings (kWh)	Annual Cost Savings	NBC Funds	Number of Sites
Large PV Array - Ground Mounted Solar Project	\$198,720	\$198,720	\$0	36,800	\$4,784	\$0	1
Small Array Sites - Ground or Pole-Top Mounted Solar PV Projects	\$62,100	\$62,100	\$0	5,440	\$707	\$0	3
Gate, Diversion and Other Structures - Utility Pole Mounted Solar PV Pilot Projects	\$24,840	\$24,840	\$0	3,224	\$419	\$0	4
Permanent and CSO Metering Stations - Single Panel Solar PV Pilot Projects	\$10,120	\$10,120	\$0	806	\$105	\$0	4
Feasibility Study - High Efficiency Linear Mixer for Flat-Top Anaerobic Digester	\$20,000	\$20,000	\$0	91,453	\$11,889	\$0	1-3
Feasibility Study - Micro-Hydroelectric Turbine Systems Utilizing Treated Wastewater	\$15,000	\$15,000	\$0	411,263	\$53,464	\$0	8
Total		\$330,780					

II. FOG Environmental Results Program Project

Biodiesel/Glycerin

In response to a request from the NBC's Bucklin Point (BP) WWTF, investigations have been initiated into the feasibility of utilizing a glycerin by-product from the production of biodiesel as a carbon source within the BP WWTF's biological nutrient removal (BNR) process. The BP WWTF BNR process consists of nitrification in which ammonia nitrogen is oxidized to form nitrate nitrogen followed by de-nitrification in which nitrate nitrogen is reduced to nitric oxide, nitrous oxide and nitrogen gas. In an effort to improve the effectiveness of the de-nitrification step the NBC is conducting a pilot study using glycerin, generated as a by-product from the local production of biodiesel, as a carbon source within the BNR de-nitrification process. The glycerin is injected into the anoxic zone of one aeration tank treatment train at the surface mixer. This allows for adequate mixing of the glycerin at a point within the treatment process where available carbon is at a minimum. The effect of the glycerin on treatment operation is monitored through the use of in-line sensors and sample collection and analysis. Efforts associated with this project were halted due to low atmospheric temperatures which tend to slowdown the biological nitrification/de-nitrification process. A second sample collection pilot study was conducted in August 2011. No SIG grant funds are being used for this study.

Restaurant FOG Self-Certification Workbook

A reformatted FOG Self-Certification Workbook has been completed for distribution to local restaurants and food-service business.

URI Anaerobic Digestion Biogas Project

Throughout this project period NBC continued efforts with URI regarding research on anaerobic digestion by supplying URI with various samples of digester sludge from the BP WWTF.

III. Miscellaneous Activities

No Project Miscellaneous Activities to report for this Project Period.

Part 3 – Projection of Activities, Accomplishments, and Major Expenditures for Next Quarter Report

I. WWTF Energy Focused Environmental Management System Project

- Phase II Technical Assistance Energy Efficiency Assessments will be initiated
- Presentation on Biogas project will be made at NEBRA Conference

II. FOG Environmental Results Program Project

- Distribute FOG-ERP Workbook – Mail out workbook and certification checklists
- FOG-ERP Steering Committee – Form Steering Committee and schedule first meeting

Part 4 – Financial Report

Project Expenses

A summary of grant related expenses to-date is as follows:

[CBI Removed by EPA]

Attachments:

1. Project Milestone Summary Table