

US EPA ARCHIVE DOCUMENT

**State Innovation Grant Project
Narragansett Bay Commission
Progress Report - 10
January 1, 2011 – March 31, 2011**

Project Title: Sustainable Energy Management Practices for Wastewater Treatment Facilities

Part 1 – Synopsis of Accomplishments

During the current Project Reporting Period January 1st through March 31st, 2011 the following activities took place: the Project Partners (NBC, RIDEM, URI and 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 was put on hold due to low atmospheric temperatures (this work will pick-up in the spring months of 2011), NBC's Pollution Prevention Engineer continued to research hydroelectric energy opportunities for RI WWTFs and continued working with URI to investigate alternative sources of anaerobic digester feed (waste) materials to help improve biogas production; an EF-EMS Roundtable was held, a PSAT training session was held, NBC applied for and received \$90,000 in ARRA funds to conduct TAs of each WWTF in partnership with National Grid, and URI, RIDEM and NBC prepared the FOG-ERP Workbook, Informational Brochure and Certification Checklist for distribution to local restaurants.

Part 2 – Summary of Activities Accomplishments

I. WWTF Energy Focused Environmental Management System Project

EF-EMS Planning

EF-EMS Steering Committee

Throughout the current Project Period the EF-EMS Steering Committee continued to coordinate additional funding efforts with Mr. Ken Payne of the Rhode Island Office of Energy Resources (RIOER). On February 21st, 2011 the RIOER issued "Letters of Intent" (LOI) asking for energy project ideas to be considered for funding through the use of ARRA funds. These funds are being offered through two related programs:

- LOI# 7448309 – Wastewater Treatment Facilities – Energy Efficiency Technical Assessments
- LOI# 7448314 – Wastewater Treatment Facilities – Energy Efficiency Upgrades

In response to LOI 7448309 NBC has requested \$90,000 in ARRA grant funding to help pay for ½ the costs of conducting Energy Efficiency Technical Assessments (EETAs) of each participating RI WWTF with the other ½ of the TA costs being provided by National Grid. During the spring months of 2011 NBC will be coordinating and overseeing the performance of the EETAs by a professional energy management team.

In response to LOI# 7448314 NBC coordinated efforts with RIDEM and National Grid to encourage all RI WWTFs to request funding in order to implement “Prescriptive” Energy Conservation Measures (ECMs) identified as part of the Scoping Studies performed previously in cooperation with National Grid. Prescriptive ECMs are those measures that have known qualitative energy benefits and do not require the more detailed EETA study. At the time of this writing the actual number of responses to the LOI received by the RIOER is not available.

RIDEM WWTF Superintendents’ Meeting

On February 8th NBC staff attended a RIDEM WWTF Superintendents’ Meeting at the Warwick WWTF. During this meeting Barbara Cesaro from the Rhode Island Office of Energy Resources announced the release of ARRA funds that can be used for energy efficiency projects at WWTFs.

Roundtable Meeting

On Wednesday, February 16, 2011, NBC held an Energy Roundtable Meeting at the South Kingstown wastewater treatment facility. Speakers at the meeting included Ken Payne (RIOER), Joseph Megale (Synagro) and Wendy Carriero (National Grid). A live EPA Presentation on EPA’s Evaluation of Energy Conservation Measures for WWTFs, that prominently featured energy upgrades at Bucklin Point, was presented. The meeting concluded with a tour of new turbo blowers installed at the South Kingstown WWTF that were incentivized by National Grid.

During this meeting Dr. Ken Payne from the RIOER informed the group that \$3.1 M in ARRA funding is being made available to Rhode Island WWTFs for energy improvements. \$2 M is earmarked for the three WWTFs that were damaged during last year’s floods (Warwick, West Warwick, and Cranston), \$100,000 is earmarked to pay for ½ the cost of conducting Energy Efficiency Technical Assessments of each RI WWTF (the other half will be by National Grid), and \$1M is available to the other 16 WWTF’s for energy efficiency upgrades – no matching funds are required. Dr. Payne stated that project solicitations will be made available shortly on the Internet and must be submitted within 30 days of being issued. All projects must meet the ARRA March 31, 2012 timeline. As such projects that improve WWTF energy use and that are ready to move will be given funding priority. The RIOER Solicitation documents will ask for information on energy savings, project costs and installation/implementation timelines. In addition to the above funding opportunities Dr. Payne stated that between \$4 to 6 M in renewable energy ARRA funding that was committed to project that could not meet the 2012 deadline will soon be re-released to help fund both WWTF efficiency and renewable energy projects. Barry Wenskowicz from the NBC will be putting together information on potential renewable energy projects for the Roundtable.

At the conclusion of the meeting Joseph Megale from Synagro made a presentation on on-going and planned energy recovery projects involving sewage sludge and Jessica Cajigas from NIWPCC discussed planned efforts to assist WWTFs with addressing climate change impacts on their operations.

Roundtable Meeting/PSAT Work Shop

On Wednesday, March 9, 2011, NBC’s ESTA P2 Engineer arranged for Steve Bolles of Process Energy Systems to present a one-day hands-on training sessions on how to use the Department of Energy’s Pumping System Assessment Tool (PSAT) to assess the energy efficiency of operating pumping systems. Those in attendance included representatives from the wastewater treatment facility of Jamestown and various NBC departments including Interceptor Maintenance,

Engineering/Maintenance, Permitting and ESTA. The training included a classroom lecture and a demonstration of field measurements at the NBC Washington Park Pump Station and at the NBC Saylesville Pump Station. Steve Bolles generated useful results that showed how energy could be saved at each pump station.

Energy Audits/Scoping Studies

To-date Scoping Studies have been conducted and subsequent reports have been prepared for 17 of the 19 Rhode Island WWTFs (Woonsocket and Warwick studies were completed prior to start of the EF-EMS Program):

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
Burrville 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
West Warwick	June 16, 2010	DMI
East Providence	July 8, 2010	DMI

Hydroelectric Renewable Energy Applications

Throughout the current Project Period, NBC’s Pollution Prevention Engineer continued to compile information and facility drawings for the Field’s Point, Cranston, West Warwick and Woonsocket WWTFs to help develop a feasibility assessment on the potential use of renewable hydroelectric power.

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. The pilot study will resume in May of 2011. No SIG grant funds are being used for this study.

Restaurant FOG Self-Certification Workbook

During this project period the FOG-Self Certification Workbook was finalized and circulated to RIDEM, URI and the RI Hospitality Association for final review and comments.

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

National Grid Energy Conservation Workshop for Wastewater Treatment Facilities

On Wednesday, March 30, 2011, the NBC staff attended a National Grid sponsored Energy Conservation Workshop for Wastewater Treatment Facilities in Norwood, MA.

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

I. WWTF Energy Focused Environmental Management System Project

- A Roundtable Meeting will be scheduled for June/July 2011
- Initiate Energy Use Technical Assessments in cooperation with National Grid and the RIOER in May/June 2011

II. FOG Environmental Results Program Project

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

Part 4 – Financial Report

Project Expenses

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

	Salary	Fringe	Non-Classified Limited	Total Personnel	Operating	Travel	Overhead Expenses	Match Funds	Grant Funds
NBC	\$64,516	\$35,484		\$100,000				\$50,000	\$50,000.00
RIDEM									\$0.00
RIMES				\$16,200					\$16,200.00
URI	\$102,835.03	\$23,364.90	\$11,411	\$137,611.32	\$70.00	\$1,951.53	\$35,367.17	\$33,512	\$175,000.02
Total:				\$253,811.32	\$70.00	\$1,951.53	\$35,367.17	\$83,511.88	\$241,200.02

Attachments:

1. Project Milestone Summary Table
2. Final FOG ERP Workbook
3. Workshop Agendas
4. List of WWTF ECMs