



# The Commonwealth of Massachusetts

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**INDEPENDENT STATE AUDITOR'S REPORT ON CERTAIN  
ACTIVITIES OF THE  
MASSACHUSETTS WATER RESOURCES AUTHORITY (MWRA)  
MONITORING OF THE OPERATIONS OF THE RESIDUALS  
PELLETIZING PLANT  
QUINCY, MASSACHUSETTS**

**OFFICIAL AUDIT  
REPORT  
JUNE 3, 2008**

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### INTRODUCTION

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The Massachusetts Water Resources Authority (MWRA) was established by Chapter 372 of the Acts of 1984 to assume the duties and responsibilities of the Metropolitan District Commission's Water and Sewer Division. These responsibilities include providing water and sewer services to 61 communities and approximately 2.5 million people in the Commonwealth.

On September 5, 1985, the Federal District Court in Massachusetts ruled that waste water discharged into Boston Harbor was in violation of the 1972 Federal Clean Water Act requirements, and the court ordered MWRA to develop and implement a program to provide treatment of its wastewater as required by that law. In accordance with a court-ordered schedule, MWRA undertook a program of improvements to the wastewater collection and treatment facilities serving the metropolitan Boston area. The court order is primarily comprised of three major projects, the Deer Island Primary and Secondary Treatment Facilities, the Combined Sewer Overflow Program (CSO), and the Fore River Shipyard Residuals Pelletizing Plant. The first two projects have been reviewed by the State Auditor's Office, and a number of reports have been issued on these activities.

The residuals pelletizing plant constructed at the Fore River shipyard in Quincy, MA converts all solid waste transported from the Deer Island Treatment Plant into commercial pelletized fertilizer. The design and construction of the pelletizing plant was completed at a total cost of \$138 million. The operations and management of the plant has been subcontracted out under competitive bidding to the New England Fertilizer Company (NEFCO). NEFCO currently produces approximately 110 tons of fertilizer per day from the sludge transferred to the facility via a pipeline from Deer Island.

The objective of this review was to determine whether NEFCO is efficiently and effectively managing the pelletizing plant and adequately disposing of the final fertilizer product.

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### AUDIT RESULTS

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#### MONITORING OF PELLETIZING PLANT OPERATIONS NEED TO BE IMPROVED

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Monitoring of the pelletizing plant operations could be strengthened if contractual provisions governing formal annual evaluations are fully implemented and the results documented. MWRA's formal annual performance reviews should be submitted to the management of the New England Fertilizer Company (NEFCO), the contractor responsible for operating the plant, for written response, and the results provided to MWRA's top management and the Board of Directors for their consideration as part of their oversight monitoring responsibilities. In addition, the agreement between MWRA and NEFCO provides for MWRA to receive 900 tons of fertilizer annually free of charge. The product may be sold commercially or donated at MWRA's discretion. MWRA's efforts to market or donate the product has declined in recent years and should be renewed.

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## INTRODUCTION

### *Background*

The Massachusetts Water Resources Authority (MWRA) was established by Chapter 372 of the Acts of 1984 to assume the duties and responsibilities of the Metropolitan District Commission's Water and Sewer Division. These responsibilities include providing water and sewer services to 61 communities and approximately 2.5 million people in the Commonwealth. MWRA maintains 400 miles of water pipes, aqueducts, and tunnels, and 240 miles of sewers. MWRA's service area covers approximately 410 square miles and includes approximately 890,000 households and 5,500 businesses, which collectively produce approximately 350 million gallons of sewage each day. MWRA supplies drinking water to approximately 2.2 million people in 50 Massachusetts communities.

On September 5, 1985, the Federal District Court in Massachusetts ruled that waste water discharged into Boston Harbor was in violation of the 1972 Federal Clean Water Act requirements, and the court ordered MWRA to develop and implement a program to provide treatment of its wastewater as required by that law. In accordance with a court-ordered schedule, MWRA undertook a program of improvements to the wastewater collection and treatment facilities serving the metropolitan Boston area. This program became known as the "Boston Harbor Case." The court order is primarily comprised of three major projects, the Deer Island Primary and Secondary Treatment Facilities, the Combined Sewer Overflow Program (CSO), and the Fore River Shipyard Residuals Pelletizing Plant. The first two projects have been reviewed by the State Auditor's Office, and a number of reports have been issued on these activities.

The residuals pelletizing plant constructed at the Fore River shipyard in Quincy, MA converts all solid waste transported from the Deer Island Treatment Plant into commercial pelletized fertilizer. The design and construction of the pelletizing plant was initially completed in 1991, and was subsequently expanded and upgraded at a total cost of \$138 million. Unlike other Boston Harbor Projects, the plant design and construction was managed in-house by MWRA's Engineering and Construction Divisions. See Appendices I through IV for pertinent photos.

The operations and management of the plant has been contracted out under competitive bidding to the New England Fertilizer Company (NEFCO). Under the competitive bidding process, NEFCO

was rated by MWRA to be the best technical qualified contractor as well as the low bidder, and accordingly was awarded a 15-year contract to operate the plant. NEFCO also won the prior contract and has operated the plant since 1991.

NEFCO currently produces approximately 110 tons of fertilizer per day from the sludge transferred to the facility via a pipeline from Deer Island. Previously, the sludge was barged to the facility from Deer Island.

***Audit Scope, Objectives, and Methodology***

The purpose of our review was to determine whether NEFCO is efficiently and effectively managing the pelletizing plant and adequately disposing of the final fertilizer product.

Our audit included reviews of the various contracts and memorandums of understanding (MOUs) associated with the operation of the pelletizing plant and the landfill disposal areas. We met with the MWRA senior management including the Manager of Engineering Services, the Manager of Operations and Engineering stationed at the pelletizing plant, and with MWRA's Internal Audit Division (IAD) on several occasions to discuss plant operations and their monitoring roles. We also toured the pelletizing plant and the Deer Island Sewage Treatment Plant. Additionally, MWRA supplied us with various reports and filings that were submitted to EPA and DEP. These reports and filings were approved by those agencies.

Our audit was conducted in accordance with applicable generally accepted government auditing standards and included such audit tests and procedures, as we considered necessary under the circumstances.

At the conclusion of our review, we provided MWRA with a draft report for comment, and considered their responses in the preparation of this final report.

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## AUDIT RESULTS

### MONITORING OF PELLETIZING PLANT OPERATIONS NEED TO BE IMPROVED

Monitoring of the pelletizing plant operations could be strengthened if contractual provisions governing formal annual evaluations are fully implemented and the results documented. MWRA's formal annual performance reviews should be submitted to the management of the New England Fertilizer Company (NEFCO) for written response and the results provided to MWRA's top management and the Board of Directors for their consideration as part of their oversight monitoring activities. In addition, the agreement between MWRA and NEFCO provides for MWRA to receive 900 tons of fertilizer annually free of charge. The product may be sold commercially or donated at MWRA's discretion. MWRA's efforts to market or donate the product has declined in recent years and should be renewed.

The current contract to operate MWRA's residuals processing facility and market and distribute its output-- fertilizer pellets-- was awarded to NEFCO effective on March 1, 2001. The contract price of \$146,925,856, plus escalations and excess quantity charges, covers the 15 year period ending December 31, 2015. The contract agreement requires that NEFCO submit the following deliverables to the Authority:

- Facility Operation and Maintenance Manual
- Emergency Response Plan
- Computerized Information System with on-line access
- Annual inspection
- Annual Operating Plan- 60 days prior to the start of each operating year
- Monthly and annual operations report with all required data
- Monthly odor control report
- Maintenance repair and replacement plan
- Back-up disposal arrangements
- Record drawings
- Visitors log

Certain of these deliverables were to be submitted to the Authority during the first six months of the contract and are required to be kept current. Other deliverables are submitted on a monthly or annual basis during the term of the contract.

Completed documents addressing the operation, safety and maintenance of the plant are crucial to the Authority to ensure the efficient and effective operation of the plant.

Under the current contract with NEFCO, the sludge pellet facility has been available for operation continuously without interruption. There have been no major odor, noise, or traffic issues impacting the satisfactory operation of the facility.

### ***Annual Performance Review***

Article 6.2 of the Agreement states that the Authority will perform an annual review of NEFCO's performance, including performance standards, beneficial use requirements, odor control guarantees, and plant operations and maintenance.

Although the Authority's Residuals Manager is permanently stationed at the Quincy facility, a documented formal annual report of NEFCO's performance has never been issued. There are several distinct advantages to formalizing this annual review process.

- It would emphasize to NEFCO the importance of the contract to the Authority, and would lend support to MWRA's day-to-day oversight of operations.
- It would document to top management that all aspects of contract performance are being formally evaluated annually.

MWRA prepared a draft annual performance report for 2007 that pointed out several shortcomings in the plant operation. The report was not given to NEFCO, but reportedly the findings were verbally discussed with NEFCO. According to MWRA, some of the areas that were not up to standard have been addressed, and the remaining areas are in the process of being corrected. We found no evidence of written follow up for the shortcomings enumerated in the annual review. MWRA attributed these performance problems to prior NEFCO plant management who are no longer at the plant.

Some of the deficiencies identified in the draft report include:

- The facility should be capable of operating 24 hours per day, seven days per week. In commenting on this deficiency, MWRA advised us that NEFCO should develop a formal contingency staffing plan in the event that a sustained seven-day operation is needed.
- NEFCO has not repaired silos Nos. 6 and 9 despite numerous verbal and written directives to fix them. In commenting on this deficiency, MWRA advised us that NEFCO has taken steps to integrate the two silos back into service.
- NEFCO is required to submit an Odor Control Report together with its monthly operations report. In commenting on this deficiency, MWRA advised us that they will allow NEFCO to submit exception reports if odor control becomes an issue.
- In 2006 NEFCO failed to meet the requirement to capture no less than 90% of suspended solids in the waste product transported from Deer Island. In commenting on this deficiency, MWRA advised us that the capture rate was 88.5%, (for an eight month period in 2006).
- NEFCO has failed to comply with the no nuisance covenant described in section 8.12 of the agreement, which has resulted in poor housekeeping at the facility. In commenting on this issue, MWRA advised us that this deficiency was an occasional occurrence.

The agreement between MWRA and NEFCO provides for MWRA to receive 900 tons of fertilizer pellets free of charge annually. The product may be sold commercially or donated at MWRA's discretion. However, MWRA's efforts to market or donate the product has declined about 75% in recent years and should be renewed.

MWRA's Internal Audit Division recently completed a review of the operation and maintenance of the Fore River Pelletizing Plant. The audit report identified payment, performance, internal control and oversight issues that needed to be addressed by management to ensure contract compliance over the remaining term of the contract. We reviewed the audit report released on November 19, 2007 and noted that the report also recommended that a formal annual evaluation be completed. Some of the deficiencies in the report included:

- NEFCO invoiced MWRA for lesser quantities of excess product processed, resulting in an underpayment to NEFCO in the amount of \$122,745.
- NEFCO is required to capture not less than 90% of the suspended solids processed. The actual capture rate was 88.5%, resulting in an overpayment to NEFCO of \$163,044.

- NEFCO has not met their obligation to submit required deliverables in a timely manner or to submit all of them in final form.
- NEFCO had not met the escalation provisions of the letter of credit requirement under the terms of its contract.
- There is no documented formal annual review of NEFCO's performance.

***Conclusion***

MWRA has satisfied the court ordered program of improvements to clean up Boston Harbor, including the beneficial reuse of sludge previously released untreated into the harbor. Under the current contract with NEFCO, the sludge pellet facility has been available for operation continuously without interruption. There have been no major odor, noise, traffic, staffing or equipment issues impacting the satisfactory operation of the plant. However, the contractor has not met all the administrative requirements of its contract, and MWRA has not instituted a formal annual review of the plant operations. Also, MWRA should renew its efforts to market and/or donate its share of the fertilizer product made available under the terms of the NEFCO contract.

***Recommendation***

MWRA should conduct formal annual performance reviews of the pelletizing plant operations and submit the reports to NEFCO for written response. The results of this review should be provided to MWRA's top management and the Board of Directors for their consideration as part of their oversight monitoring responsibilities. MWRA should also renew its efforts to market and/or donate its tonnage of available fertilizer products to communities or other state and local entities having a need for the product.

***Auditee's Response***

MWRA's Executive Director provided us with the following comments relative to our report recommendations:

1. *Annual Performance Review – We have completed the formal written 2007 Performance Review and presented it to NEFCo on January 24, 2008. In addition, we have strengthened our formal documentation of the NEFCo operation with performance meetings on approximate six-week intervals with written minutes for the record. These minutes will in turn become the basis for the Annual Performance Review. Senior management will be reviewing the annual performance of NEFCo.*

2. *Silo Operation – All nine silos are now fully operational.*
3. *Underpayment/Overpayment – All payment issues have now been resolved through invoice adjustments.*
4. *MWRA Fertilizer Program – We will commit to renewing our efforts to market and/or donate the fertilizer product provided under the terms of the contract (900 tons annually). MWRA will once again notify all communities that the pellets are available for their use and are available for pickup at the Fore River Shipyard.*

***Auditor's Reply***

We are satisfied with MWRA's actions and plans to improve oversight and operation of the pelletizing operation.

## APPENDIX I

### Aerial View of Pelletizing Plant



## APPENDIX II

### Centrifuge Spinning Sludge to Remove Water



### APPENDIX III

#### Polymer Being Added to Unprocessed Sludge to Thicken it



## APPENDIX IV

### Completed Sludge Fertilizer Pellets

