2007 Periodic Biosolids Program Performance Report

Issued: February 2008

Introduction

The Grand Rapids Wastewater Treatment Plant (GRWWTP), located in Grand Rapids, MI, provides wastewater collection and treatment for the City of Grand Rapids and 14 surrounding communities totaling approximately 360,000 customers within a 200 square mile geographical area. The wastewater plant has a design capacity of 61 MGD and currently has an average daily flow of 51 MGD. The facility was constructed in the 1920's and treatment consisted of primary clarification, anaerobic digestion, and drying beds. The Biosolids from the drying beds was bagged and sold to businesses and homeowners for fertilizer for many years. In the mid 1950's the plant was expanded to include secondary treatment capability utilizing activated sludge as the biological treatment process along with increased primary treatment capacity and disinfection. In the 1970's the facility was again expanded to increase flow capacity and solids handling processes. Solids handling converted from anaerobic digestion to thermal heat treatment using low pressure oxidation. In 2005 the plant converted from Chlorine as a disinfectant to UV disinfection.

The GRWWTP was part of a third round of agencies participating in the National Biosolids Partnership (NBP) Environmental Management System (EMS) for Biosolids. Development of our EMS program started in early 2005 with the creation of an internal EMS team. Team members attended four (4) NBP sponsored workshops which helped guide the development of our EMS. The GRWWTP Biosolids EMS was formally certified by the NBP in December 2006 and successfully completed our first annual interim audit in November 2007.

Outcomes Matter

The NBP has identified key outcomes which serve as good indicators of successful and well managed Biosolids management practices. Efforts undertaken by GRWWTP during the past year in support of these outcomes are detailed below.

Quality Management Practices

- Installed emergency backup power supply generator in the Wastewater plant preliminary treatment building to help assure continuous operation of this critical control point.

- Revised Significant Industrial Users (SIU) compliance inspection practices and procedures to better address current industrial processes and regulatory requirements.
- Tracked maintenance activities to better determine program effectiveness. By monitoring the ratio between corrective work and preventive work we are able to determine how effective our maintenance programs are.
- The degree of compliance with our NPDES permit is an indicator of how effectively the facilities are being operated and managed. The plant maintained a compliance record exceeding 99.9% for 2007.

Relations with Interested Parties

- Conducted a plant odor control study in 2007. The study analyzed odor emissions from all plant treatment processes to help identify sources. Sources were ranked and included recommended abatement technologies and budgetary information. This will establish an action plan for upcoming odor abatement efforts at the Wastewater plant.

Regulatory Compliance

- Installed emergency power generator in the preliminary treatment building. This will help the Wastewater plant achieve the requirement of uninterrupted service and exceed regulatory requirements by maintaining not only a plant wide redundant power supply but a localized power supply for the preliminary treatment building due to its critical nature.
- Revised SIU permit compliance and inspection procedures to better address current industrial processes and regulatory requirements.
- Maintained greater than 99.9% compliance with all regulatory requirements.

Environmental Performance

- Installation of emergency power generator in preliminary treatment building will help ensure continuous treatment and better protect the environment from accidental spills.
- Maintaining an effective maintenance management program at the Wastewater plant helps ensure reliable equipment and operations and helps to prevent accidental spills.
- A motivated staff striving to achieve 100% compliance with all regulatory requirements is focused on protecting the environment. The Grand Rapids staff operates the Wastewater plant in a highly effective and professional manner and consistently achieves regulatory compliance in excess of 99.9%.

Biosolids Value Chain - Monitoring and Measurement Report and Progress

Monitoring and measurement provides critical input to the organization relative to the effectiveness of it operational controls. This information helps to identify any weaknesses or other areas in which the program can be improved.

Wastewater Collection and Pretreatment

- *Significant industrial users* – During 2007 staff worked with industries and regulators to implement new compliance inspection procedures.
- *Commercial user discharges* – Staff reviews discharge permit applications and issues discharge permits.
- *Discharge authorization permits* – Discharge requests which are typically shorter in duration are handled through this process. This allows staff to characterize the nature of the proposed discharge to determine any detrimental impacts it may have on the Wastewater plant.
- *Pollutant minimization* – Efforts in this area have historically focused on Mercury discharges into the Wastewater collection system. Staff works with dental offices and other possible Mercury sources to reduce discharges into the collection system. Wastewater plant influent Mercury is tracked to determine program effectiveness. Major trunk lines are monitored to help identify sources.

Wastewater Treatment and Solids Generation

- *Solids screening and grit collection* – Recently installed "fine" bar screens in the Wastewater plant head works has significantly reduced screening type debris in the Biosolids.
- *Scum* – This product consists of greases and oils which enter the Wastewater plant through the collection system. A proactive program to capture and remove grease and oil at lift stations has helped reduce grease and oils contained in the Biosolids. The captured grease and oil is collected and transported to local landfills for disposal.
- *Primary treatment* – Some of the work accomplished in 2007 includes: 1) Structural improvements to clarifiers, 2) Scum removal equipment replacement, 3) Biosolids pumping algorithm optimization.
- *Raw sludge storage* – Biosolids are held in 1 of 4 storage tanks prior to dewatering. Level monitoring equipment has been replaced to more accurately measure tank level and prevent any accidental spills.
- *Secondary treatment* – BioP facilities started up in the South aeration plant have proven exceptionally effective. Bio selector features incorporated into the South plant design have dramatically reduced filamentous organisms and resultant operational problems.

Solids Stabilization, Conditioning, and Handling

- *Centrifuge dewatering* – Centrifuge operation was impacted when a contractor dropped a centrifuge bowl/scroll assembly during routine maintenance/repair. The dewatering contractor utilized a smaller trailer mounted centrifuge while repairs were being completed.
- *Centrifuge thickening (WAS)* – The WAS centrifuges were not utilized during the year except for test/exercise purposes.
- *Gravity belt thickener* – The contractor utilizes the gravity belt thickener prior to centrifuge dewatering. Equipment operation was as expected with no process upsets during the year.

- *Odor control* – Odor control system experienced some difficulties when a replacement ORP probe shipment was delayed. The contractor operated the odor control equipment in a manual mode utilizing best approximate system settings to maintain adequate odor control.

Solids Storage and Transportation

- *Truck loading* – The contractor maintains logsheets and inspects each truck before departure from the site to ensure that there is no leakage or tracking issues.
- *Truck cover* – All trucks are covered during transport to the landfill site in accordance with State law.
- *Truck transport to landfill* – The contractor maintains records of dates, drivers, landfill sites for each load leaving the site.
- Truck Washing Procedures – The contractor maintains procedures to wash and inspect trucks to minimize odors and tracking issues.

Biosolids End Use or Disposal

- *Landfill* – The Contractor works with the landfill to properly incorporate the Biosolids into the municipal trash. This augments the decomposition process and maximizing the potential for methane gas which is recovered and beneficially used.

Internal Audit

An internal audit of the City's EMS was conducted during the first quarter of 2007. Nonconformances identified during the audit are noted below.

- Element 4 Table 4.1 was found to be out of date following the issuance of a new NPDES permit. The Table was revised for consistency with the NPDES permit.
- Element 6 Table 6.1 is inconsistent with Table 6.2 and one public contact reference was found to be out of date. Table 6.1 was removed from Element 6 as it was redundant. Contact information for WMEAC was corrected.
- Element 11 Table 11.2 Emergency Equipment Inventory was found to be out of date. Removed Table 11.2 from Element 11 which is a redundancy from SOP 3510.
- Element 13 Figure 7.2 refers to Figure 3.1 "CCP Quarterly Review". Figure 3.1 is actually titled "CCP Periodic Review". Reference to Figure 3.1 was corrected.
- Element 17 – There was no indication as to how management input would be acted on. Revised Element 17 to include response to management input and revised Table 17.1 to include a section on the form to address how input was responded to.

Third Party Verification Audit

- The City completed its initial verification audit in October 2006 and its first interim audit in November 2007.

Interested Parties Input/Participation

- During the last quarter of each year the City develops a list of goals and objectives for the next year. As part of this process we seek input from our interested parties regarding concerns and issues they may have. We did not receive any feedback from interested parties in 2007.
- Held a meeting with industrial users to discuss new compliance inspection procedures. Industries impact on Biosolids quality was discussed as well as the City's Biosolids EMS.
- The City will continue to keep interested parties apprised of our efforts and will continue to seek input as part of our continuous improvement process.

Current Year Goals & Objectives

An important component of our Biosolids EMS is continual improvement. Annually goals are identified based on key outcomes, Biosolids value chain, or EMS improvements. During the past year staff determined the following goals would help us achieve these objectives.

Conduct Odor Control Study at Wastewater Treatment Plant

- During 2007 the City conducted a study at the Wastewater plant to identify odor sources, characterize type and concentrations, develop a priority list, develop budget cost information, recommended abatement technologies, 5 year capital improvements plan to implement odor control technologies.

Install Emergency Generator in Preliminary Treatment Building

- During 2007 an emergency standby generator was installed to service the preliminary treatment building and the Wastewater plant administrative offices.

Revise SIU Annual Compliance Inspection Procedures

- During 2007 staff worked with industries and regulators to develop new inspection procedures more closely aligned with current industrial practices and regulatory requirements.

Maintain a Minimum 75% ratio of PM Versus CM Workorders

- During 2007 staff achieved greater than 80% preventive maintenance (PM) versus corrective maintenance (CM). This indicates a well operated maintenance department which is operating in a highly proactive versus reactive mode.

Maintain 100% NPDES Permit Compliance

- During 2007 the Wastewater plant achieved a greater than 99.9% permit compliance record. During June 2007 there were two permit violations for Ammonia. This was tracked to an industrial discharge. The company was placed on a compliance schedule and has since corrected all deficiencies identified by staff.

Summary

Implementing a Biosolids EMS has proven to be a daunting task but a worthwhile one. Success was achieved only through the hard work and dedication of staff and our contractor as well as support from administration and the National Biosolids Partnership. Continual improvement of our Biosolids management practices and EMS are an ongoing process which will only improve as new practices developed as part of the EMS are utilized and refined. We have already identified new goals for 2008 which we feel will further improve our Biosolids quality and management practices.

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