

## 2008 Periodic Biosolids Program Performance Report

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### 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 49 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. During 2008 an internal audit was performed.

## **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**

- Began construction of a new storage and dewatering facility as part of the Grand Valley Regional Biosolids Authority.
- Completed a Odor Control study identifying strengths and on site effects of Odors at the facility. Possible improvements were indentified and may be implemented in the future.
- 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 of 100% for 2008.
- Moved Biosolids EMS and all SOP's into Microsoft Sharepoint which is now utilized for document management.

### **Relations with Interested Parties**

- Completed a plant odor control study in 2008. 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. The study determined that the Odor impact off site to residential areas was restricted to very rare occurrences.

### **Regulatory Compliance**

- Completed a study and began design of modifications to the primary effluent retention basin for utilization as a flow equalization basin.
- Completed design to add an additional final effluent screw pump to lift effluent out of the plant during elevated river levels.
- Replacement of 30 year old ferrous chloride storage tanks (6 @ 30,000 gals each) was completed.
- Upgraded the Industrial Pretreatment software for improve tracking of SUI's.
- Maintained greater than 100% compliance with all regulatory requirements.

### **Environmental Performance**

- Completed installation of a large rain garden to treat and manage stormwater runoff in a central area of the facility.

- Construction of the new Biosolids Facilities is being performed using LEED requirements. All storm water from these facilities is managed with no off-site migration. The dewatering facility will likely receive a LEED certification. Multiple waste bins are used to manage the waste/recycle streams from the construction site.



The dewatering equipment and polymer system is being fabricated less than 25 miles from the facility.

- 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%.
- In 2005, the City (including the Wastewater Plant) formed a Renewable Energy Team that began meeting with various community partners, companies, and energy experts in search of the best way to fulfill the 20% renewable energy goal set by Mayor George Heartwell. The City Commission approved a purchase that met the 20% goal in November, 2007. This purchase continues to significantly reduce Grand Rapids' carbon footprint by offsetting the greenhouse gasses (carbon dioxide, sulphur dioxide and nitrogen oxide) produced using non-renewable sources and qualifies the City for this recognition by the EPA.
- Over the last 18 years the City of Grand Rapids has worked aggressively to reduce Combined Sewer overflow volumes by 99.9% and is continuing work to remove the remaining 0.1%.

### **Biosolids Value Chain - Monitoring and Measurement Report and Progress**

Monitoring and measurement provides critical input to the organization relative to the effectiveness of its 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 2008, staff worked with industries and regulators to insure compliance with local, state, and federal discharge laws and tracked industrial reports to insure accuracy and completeness.
- *Commercial user discharges* – Staff reviewed survey questionnaires sent to commercial users and monitored new commercial facilities. Significant industrial user permits were issued to those dischargers meeting the criteria of significant user.
- *Discharge authorizations* – Discharge requests which are typically short in duration are handled through this process. This allows staff to characterize the nature of the proposed discharge to determine any detrimental impacts that might occur if discharge was allowed to the wastewater plant.
- *Pollutant minimization* – Efforts in this area have historically focused on the discharge of toxic metals, including mercury, into the wastewater collection system. The State of Michigan recently adopted new regulations for the management of Mercury for dentist offices. This restricts our ability of control mercury levels in wastewater. Wastewater plant influent mercury is still tracked to determine program effectiveness. Major trunk lines are also routinely 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* – Changed weir elevations in the South Secondary plant to improve the hydraulic performance of the North Primary Plant..
- *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. Initiated a project to convert the North Plant to BioP.
- *Changes in Flows* – The North Kent Clean Water Plant went online in early December 2008 reducing flows to the Grand Rapids

## Solids Stabilization, Conditioning, and Handling

- *Centrifuge dewatering* – Centrifuge operation went smoothly during 2008.
- *Centrifuge thickening (WAS)* – The WAS centrifuges were not utilized during the year.

- *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 worked great all year. The wastewater plant did not experience any odor complaints.

### **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. There were no spills in 2008.
- *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. South Kent landfill was used to dispose of Biosolids for a few months, after that test period they released an RFP for adding methane capture to the site.

### **Internal Audit**

An internal audit of the City's EMS was conducted during the first quarter of 2008. The NBP approved the use of the internal audit for the interim audit. There were no non-conformances identified during the audit.

### **Annual Operational Controls Review**

During October 2008 a review was conducted of Operational Control and Standard Operating Procedures (SOP's). Several minor changes were made to SOP's to improve the effectiveness. It was noted that SOP-2704 will need to be updated once the effectiveness of the tracking summary report is determined. The dewatering contractor's SOP for the Gravity Belt Thickener was update to include better coordination better the contractor operator and the City's operator.

### **Third Party Verification Audit**

The City completed its initial verification audit in October 2006 and its first interim audit in November 2007. In the fall 2009 the City plans to undergo it's next third party audit.

### **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 receive

- feedback from six (6) interested parties in 2008 and incorporated the comment into our goals and objectives.
- Held an annual 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.

#### **Implement odor control improvement in the Preliminary treatment building**

- During 2007-2008 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 and recommended abatement technologies. Based on the results of the study the plant does not negatively effect residential areas and the implementation of an abatement program has been discontinued.

#### **Construction new Biosolids Storage Tanks**

- Construction was started in 2007 and the tanks will be on line during the 3<sup>rd</sup> quarter of 2009.

#### **Construction of a new Biosolids Dewatering Facility**

- Construction was started in 2007 and the facility will be on line during the 3<sup>rd</sup> quarter of 2009.

#### **Maintain a Minimum 75% ratio of PM Versus CM Workorders**

- During 2008 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 2008 the Wastewater plant achieved 100% permit compliance record.

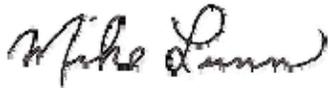
### **Summary of Non-Conformances**

- 2008-1
  - Periodic Management Review of Performance not completed by February 29<sup>th</sup>, 2008. Root cause in change in positions and EMS coordinator. Review completed 4/30/08 when non-conformance was identified during quarterly reviews.
- 2008-2

- A failure of the power supply for the transmitter on the scrubber well lead to centrate overflowing into the Ash Lagoon. Training in this area was added to the contractors list. Instrumentation changes were made to prevent operation of the sludge pumps in the event of a centrate pump failure.

## Summary

Implementing a Biosolids EMS has proven to be a worthwhile effort. 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 2009 which we feel will further improve our Biosolids quality and management practices.



Mike Lunn  
EMS Coordinator

Revision – During the internal audit it was noted that the Summary of Nonconformance did not appear in the annual report and during the management review other items for improvement were noted, subsequently the report was updated in March 2009.