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Matthew L. Snyder, E.I.T., LEED AP O+M
Sewer Project Coordinator
City of Chattanooga Public Works
455 Moccasin Bend Road
Chattanooga, TN 37405

July 14, 2015

Re: Continued Platinum Level Certification

Dear Matthew,

On behalf of the National Biosolids Partnership (NBP), we once again congratulate you and all of the staff of the City of Chattanooga Public Works on completion of your 2015 NBP Biosolids Management Program audit for continued Platinum Level Certification. Congratulations!

This designation recognizes that your BMS meets the NBP program requirements and supports excellence in biosolids management practices, augments regulatory compliance, advances environmental performance, and provides meaningful opportunities for public participation.

Your biosolids management system is a model of continuous improvement and dedication to the program. The 2015 findings and strengths of the Chattanooga program are impressive. We are pleased to continue to have the City of Chattanooga as a part of this international program, demonstrating excellence and leadership in biosolids management.

Sincerely,

Vince De Lange
Chair, NBP Advisory Committee

Lisa McFadden
Senior Program Manager
WEF Water, Science & Engineering Center

Cc:
Mike Patrick, Director
Jeff Rose, Deputy Director



TIER



REPRESENTING ACHIEVEMENT IN
BIOSOLIDS MANAGEMENT AND ENVIRONMENT STEWARDSHIP

PLATINUM LEVEL AWARD

This organization,

City of Chattanooga
Moccasin Bend Wastewater Treatment Plant,
Chattanooga, TN

has successfully met the Platinum Level requirements for the

National Biosolids Partnership
Biosolids Management Program

that supports excellence in biosolids management practices, augments regulatory compliance obligations, environmental performance and provides meaningful opportunities for public participation.

A handwritten signature in black ink, reading "Vince De Lange".

Vince De Lange, Chair, NBP Advisory Committee



2015



National Biosolids Partnership

BMP Audit Report

City of Chattanooga Moccasin Bend Wastewater Treatment Plant

Chattanooga, TN

2015 Internal Audit

Audit Dates: March 9-13, 2015

Audit Conducted by: City of Chattanooga ISS BMS Internal Auditor

Auditor: Matthew L. Snyder

Report Written by: Matthew L. Snyder E.I.T, LEED AP

Report Date: March 14, 2015 (FINAL)

Technical Content Review by: M. Patrick, Director-Waste Resources Division, and
S. Barbee, BMS Coordinator (ending Feb. 2015)

EXECUTIVE SUMMARY

The City of Chattanooga Interceptor Sewer System BMS Internal Auditor conducted an internal audit of its Biosolids Management System in early March of 2015. The purposes of the audit were

- to determine if the Chattanooga ISS is complying with its Biosolids Management Policy, the NBP Code of Good Practice, and program requirements as found in the Chattanooga BMS Manual.
- to determine if the Chattanooga ISS is making satisfactory progress toward its BMS Goals and Objectives.
- to evaluate the effectiveness of the City of Chattanooga's Biosolids Management System by reviewing selected processes from within the Biosolids Value Chain.

This internal audit was conducted in preparation of the year 6 third party interim audit expected to occur in May 2015. As such, a review of Management System Dynamics including Examination of Outcomes was also conducted to meet the standards of the third-party audit.

Audits were conducted for all processes and associated elements in the biosolids value chain: Pretreatment & Collection; Wastewater Treatment & Solids Generation; Biosolids Preparation (incl. stabilization, conditioning, & handling); Solids Storage & Transportation; Biosolids Use-Land Application-Tennessee; Communication (internal & external); Competency, Awareness, & Training; Compliance (with legal & other requirements); Contractor Control; Corrective and Preventive Action; Critical Control Points & Operational Controls (identification); Document Control & Recordkeeping; Emergency Preparedness; BMS Documentation; BMS Planning; Engineering (incl. process design); Goals & Objectives; Internal BMS Audits; Laboratory; Maintenance; and Management Involvement (incl. Policy, Mgmt. Review); Maintenance Safety

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Subject / Process	Key BMS Elements *	Internal Audit 2015	Internal Audit 2016	Internal Audit 2017	Internal Audit 2018
			Interim		Interim
Management System Dynamics					
Review of Significant Changes			✓		✓
Examination of Outcomes	-		✓		✓
Effectiveness Reviews: Corrective & Preventive Action Status Goals & Objectives Status Management Review			✓		✓
Policy commitments			✓		✓
Communication Program (incl public participation)			✓		✓
Review of Internal Audits (& related corrective action)			✓		✓
Verification of corrective action for open Third Party Audit nonconformances			✓		✓
Process Audits					
Pretreatment	3,7,10,13	✓			
Collection System	3,7,10,13			✓	
Wastewater Treatment & Solids Generation	3,7,10,13			✓	
Biosolids Preparation (incl stabilization, conditioning & handling)	3,7,10,13		✓		
Solids Storage & Transportation	3,7,10,13		✓		
Biosolids Use – Land Application - Tennessee	3,7,10,13	✓			
Communication (internal + external)	6,9,15		✓		

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Subject / Process	Key BMS Elements *	Internal Audit 2015	Internal Audit 2016	Internal Audit 2017	Internal Audit 2018
			Interim		Interim
Competency, Awareness & Training	7,8			✓	
Compliance (with legal & other requirements)	4,13,14		✓		
Control of Contractors & Suppliers	various	✓			
Corrective and Preventive Action	14	✓		✓	
Critical Control Points & Operational Controls	3		✓		
Document Control & Recordkeeping	12				✓
Emergency Preparedness	11			✓	
BMS Documentation	1				✓
Engineering / Process Design incl mgmt of change)	3,4,10	✓			
Goals, Objectives & Action Plans (setting)	5,13	✓		✓	
Internal Audits	16	✓			
Laboratory	13	✓			
Maintenance	10	✓			
Management Involvement (incl Roles & Responsibilities, Mgmt Review)	2,5,7,17			✓	✓

* - applicable requirements of all BMS Elements will be audited for each process. "Key elements" are shown for reference to demonstrate that all 17 NBP Elements are covered during the interim audits cycle, as required.

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The audits consisted of interviews with City of Chattanooga ISS staff members with responsibility in the processes/elements covered by the audit, a review of applicable records, and, where required, direct observation of operations.

The BMS internal audit identified a number of strengths in the City of Chattanooga's program, two findings for which corrective action is required, and two opportunities for improvement, which are summarized below. Corrective and preventive action plans addressing findings from the previous internal/interim audits were also reviewed and all were found to be adequate.

Based on the results of the internal audit, the City of Chattanooga ISS is complying with its Biosolids Management Policy and the National Biosolids Partnership Code of Good Practice, is making satisfactory progress toward achieving its biosolids program goals and objectives, and its Biosolids Management System is working effectively.

SUMMARY OF AUDIT FINDINGS

BMP Strengths

- A study was completed by consulting engineers for a Green Infrastructure Program Plan which includes controls for the combined sewer system sub-basins which will reduce I&I flows to the wastewater treatment facility.
file://mbfileserv1/bmp/Biosolids%20Management%20Team/Matthew%20Snyder%20-%20Sewer%20Project%20Coordinator/Projects/Collection%20System/Consent%20Decree%20Documentation/GI%20Master%20Plan_3_18_15_Public%20Review%20Submittal.pdf
- **Fats, Oils, and Grease ("FOG") Management** CMOM Program to establish methods to identify persistent sources of FOG causing problems in the WCTS and the best method or mechanism for addressing those sources; Established a Performance Measure to Maintain 100% trained staff to monitor the number of Pretreatment Program employees trained on FOG Management Program.
- Evaluate the effectiveness of the FOG Program and identify new goals and Key Performance Indicators (KPIs); Monitor cost of regulatory fines for SSOs due to FOG, and Established Performance Measure to < 15% ratio of

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noncompliance/inspections to measure the number of annual Noncompliance Notifications versus the total FSE inspections.

file:///mbfileserv1/bmp/Biosolids%20Management%20Team/Matthew%20Snyder%20-%20Sewer%20Project%20Coordinator/Projects/Collection%20System/Consent%20Decree%20Documentation/Annual_Report_No_2_-_2014.pdf

- MBWWTP Process Controls Program: The MBWWTP Process Controls Program is being developed pursuant to Paragraph 25 of the CD. The purpose of this project is to minimize the frequency, duration, and volume of any bypass and violation of an effluent limit at the MBWWTP through proper management, operation and maintenance controls. This program was submitted to the PDR for public review and comment on October 13, 2014, followed by submittal to the EPA and TDEC on November 18, 2014. Pending comments and any required revisions, EPA and TDEC approval is anticipated early in 2015.
- Establishment of an Inter-Jurisdictional Agreement Program The inter-jurisdictional agreement program was developed in accordance with the Consent Decree. This program will govern the renewal of existing agreements or the entering of new agreements that cover the collection, conveyance, and treatment of sewage by the City from municipal satellite sewer systems. The program, among other things, sets forth provisions including flow limitation requirements, management and maintenance requirements, compliance requirements for industrial users, and mechanisms for modification and enforcement of the agreements.
 - The City initiated renegotiation of agreements with the following regional customers during the reporting period:

- Windstone, TN & GA

The City plans to initiate renegotiation of agreements with the following regional customers during the upcoming reporting period:

Hamilton County, TN WWTA
East Ridge, TN
Soddy Daisy, TN

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Red Bank, TN
Rossville, GA
Walker County, GA

Renegotiations of the agreements with the following regional customers should be completed during the upcoming reporting period:

Hamilton County, TN WWTA,
East Ridge, TN
Soddy Daisy, TN
Walker County, GA

- The MBWWTP Bar and Fine Screen Replacements project is being performed this year. Existing screening facilities at the MBWWTP influent pump station are inefficient and at the end of their useful service life. In addition to their age, the fine screens blind often due to rags in the influent. The purpose of this project is to design and construct a solution which will correct the screening issues at the plant.
- The MBWWTP Effluent Disinfection System Upgrade project also is being performed this year. This project involves the design and construction of a new bulk sodium hypochlorite system to replace the existing chlorine gas system at the MBWWTP which will drastically increase safety to the operators and public by eliminating the need for Chlorine Gas.
- In order to increase Environmental Performance, the SSES Work Plan is being developed in accordance with the CD. The purpose of the SSES Work Plan is to assess, analyze, and rehabilitate the infrastructure of City's Sanitary Sewer System in order to address I&I, structural defects, and other conditions which currently cause or which may cause SSOs. The work plan will establish procedures for prioritizing problem areas within the sewer system and for setting schedules which will allow for the efficient undertaking of the assessment and rehab.

[http://mbfileserv1/bmp/Biosolids%20Management%20Team/Matthew%20Snyder%20-%20Sewer%20Project%20Coordinator/Projects/Collection%20System/Consent%20Decree%20Documentation/Semi-Annual Work Progress Report No 3 - 2nd Period - 2014%20\(1\).pdf](http://mbfileserv1/bmp/Biosolids%20Management%20Team/Matthew%20Snyder%20-%20Sewer%20Project%20Coordinator/Projects/Collection%20System/Consent%20Decree%20Documentation/Semi-Annual%20Work%20Progress%20Report%20No%203%20-%202nd%20Period%20-%202014%20(1).pdf)

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Findings

- **Finding IAT/15-01** BMS Manual Section 6.4 MANAGEMENT REVIEW purpose states that the BMT will evaluate the suitability, adequacy and effectiveness of the Biosolids Management System and provide direction for continually improving performance of the biosolids program consistent with the Biosolids Management Policy. The BMT did not hold meetings in the 3rd and 4th quarters of 2014, and no documentation was available to audit. The Policy is also in a state of review because of the incomplete Solids Economic Study which may or may not change the goal to meet Class A standards.
- **Correction/Corrective Action:**

Responsibilities

BMS Management Team – evaluates, reviews, and reports the performance, effectiveness, and adequacy of the Biosolids Management System and its related processes.

Process Description



Procedure

Management Reviews are scheduled by the BMS Coordinator to occur at least quarterly.

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Management Reviews are conducted by the BMS Management Team using the following agenda:

- Follow up from previous management reviews
- Program performance indicators and results
- Status of progress towards goals and objectives
- External Communication and public relations
- Audit results (as necessary)
- Corrective and Preventive Action
- Review of Biosolids Policy
- Changing Circumstances (MOC)

Management review meeting minutes are prepared, recorded and communicated as directed by the BMS Coordinator and include conclusions reached during the management review related to the suitability, adequacy, and effectiveness of the BMS based on:

- Biosolids activities that are working well and those that are not working well
- Areas for improvement, including documentation and communication of any changes
- Performance against biosolids policy commitments

Subsequent to management review, changes and follow-up actions to policies, plans, procedures, practices, and other BMP elements that occur as a result of findings and evaluations are documented in the management meeting minutes and tracked by the BMS Coordinator.

- **Finding IAT/15-02** BMS Manual Section 6.1 BIOSOLIDS OBJECTIVES FOR IMPROVEMENT procedure states that the BMT will develop a progressive step-by-step action plan for each objective, outlining the timeline and responsibilities for each step of the action plan. Monitor, measure, and review progress toward goals and objectives at least quarterly during Management Review meetings or other meetings. If progress is determined to be inadequate, the management team may use the Corrective and Preventive Action Process to evaluate the problem. The BMT did not hold meetings in the 3rd and 4th quarters of 2014, and no documentation was available to audit from or after those quarters.

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Correction/Corrective Action: A plan will be developed by the responsible party named in section 6.1 Responsibilities to complete the following:

Responsibilities

Director-Waste Resources Division

- Approves the adoption of biosolids goals and objectives and the associated action plan; reviews performance toward goals.

BMS Management Team –

- Establishes the goals and objectives and monitors and tracks performance toward said goals and objectives.

Procedure

Biosolids objectives are established at least annually by the BMS Management Team and include consideration of:

- Strategic plans
- Policy commitments, biosolids goals and other direction from the Director-WRD
- Input from management reviews, including changing circumstances –
- Input from interested parties, as submitted by the BMS Coordinator;

Objectives can also consider:

- Improvement of environmental performance of biosolids management activities
- Best management practices
- Critical Control Points
- Occupational Safety and Health
- Technological Options
- Financial, operational, and business requirements

Ensure objectives use SMART criteria (specific, measurable, achievable, relevant, and time-bound).

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Develop a progressive step-by-step action plan for each objective, outlining the timeline and responsibilities for each step of the action plan.

Monitor, measure, and review progress toward goals and objectives at least quarterly during Management Review meetings or other meetings. If progress is determined to be inadequate, the management team may use the Corrective and Preventive Action Process to evaluate the problem.

Opportunities for Improvement

- Again, perhaps more of the daily process and production monitoring (that is already taking place) could be used to generate more meaningful and outcome-relevant KPIs; for instance, **percentage of biosolids that couldn't be land applied**, or **percentage of biosolids that had to be re-stabilized**.
- ISO 14001, 18001, & 50001 could be used to develop new Goals & Objectives for the BMS.

AUDIT SCOPE AND METHODOLOGY

The City of Chattanooga Interceptor Sewer System BMS Internal Auditor conducted an internal audit of the City's Biosolids Management System in early March of 2015. The purposes of the internal audit were to determine if the Chattanooga ISS was complying with its Biosolids Management Policy, the NBP Code of Good Practice, and program requirements as found in the Chattanooga BMS Manual, making progress toward its BMS Goals and Objectives, to evaluate the effectiveness of the City of Chattanooga's Biosolids Management System by reviewing Management System Dynamics including Examination of Outcomes, and prepare for the year 5 third party reverification audit by reviewing all processes and associated elements in the Biosolids Value Chain.

Currently the internal audit team has been dissolved but has previously consisted of four City of Chattanooga ISS staff members selected by the Director-Waste Resources and the staff members' respective supervisors. Those individuals were chosen based on their knowledge of the organization's operations and their ability to objectively gather evidence. Mr. Snyder, a new lead auditor trainee, received BMS audit direction from Mr. Ed Wellman of the City during this 2015 audit, and has participated as the BMS Coordinator through three internal audits and three third party audits prior to his year and a half hiatus. This was the first year that the City adopted a single auditor approach out of necessity. It has been brought to the attention of management that auditor training and additional audit staff is needed.

The scope of the audit covered the following processes and associated elements of the Chattanooga biosolids value chain. Audits were conducted for the following processes: Pretreatment; Biosolids Use-Land Application-Tennessee; Contractor Control; Corrective and Preventive Action; Engineering (incl. process design); Goals & Objectives; Internal BMS Audits; Laboratory; Progress toward resolving previous findings from the most recent internal audits was also evaluated in this year's internal audit.

The process audits consisted of interviews with City of Chattanooga ISS staff members with responsibility in the processes covered by the audit, a review of applicable records, and, where required, direct observation of operations. Staff

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members interviewed were identified by the internal audit team, and along with documents reviewed are listed in the Appendix.

Conformance with City of Chattanooga's Biosolids Management Policy

1. Managing biosolids in an environmentally sound, sustainable, socially acceptable, cost-effective, and safe manner, in accordance with the ten principles of the NBP Code of Good Practice—In 2014, Chattanooga once again beneficially reused virtually all of the biosolids generated, which were land applied in Tennessee, thus saving landfill space and costs of about \$2.1 million per year and reducing the City's carbon footprint. No lost time accidents related to biosolids were incurred in 2014. Biosolids again met the EPA's criteria for Class B material. There continues to be a very high level of satisfaction with Chattanooga's product among end users, attributable to the quality of the product and the fertilizer cost savings realized by the farmers in the program.
2. Complying with all applicable federal, state, and local laws and regulations pertaining to biosolids including management, transportation, storage, and beneficial use and disposal of biosolids—The City of Chattanooga and their contractors were not cited for any 503 violations (air, metals, TDOT, etc.) and did not receive any NOVs in 2014. Procedures were established in 2014 to evaluate trends in lab analysis results, with specific emphasis on metals and vector attraction reduction, to ensure product quality prior to field distribution.
3. Requiring land appliers of biosolids to comply with the provisions of the NBP Manual of Good Practice as well as local, state, and federal laws, rules, regulations, and guidelines governing land application practices—The City's agreement with Synagro spells out the required conduct of the land application contractor, and their compliance with those requirements continues to be outstanding. Synagro has collaborated as partners with the City in most aspects of the program improvements undertaken during the year, such as production of Class A product, vector attraction reduction improvements, and research toward the new TDEC permitting requirements for 2015. Application rates are derived with a long term view that allows for

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multiple applications over a period of several years. Safety factors are incorporated so that biosolids are applied on permitted land application sites at lower rates than the specific agronomic loading rates prescribed by the University of Tennessee Agricultural Extension office for the specific crop being planted. There were no NOVs or violations of the federal 503 regulations in 2015.

4. Implementing a Biosolids Environmental Management System that conforms to the NBP BMS Program—Chattanooga's **Biosolids Management Team** continue to effectively implement the quality management philosophy and commitment to continual improvement. Also, the introduction of the new state permitting requirement amplifies the benefits of being an NBP certified organization, where permits for each individual application location will no longer be required, but will be covered by the general permit.

Conformance with the NBP Code of Good Practice

1. Compliance: To commit to compliance with all applicable federal, state, and local requirements regarding production at the wastewater treatment facility, and management, transportation, storage, and use or disposal of biosolids away from the facility—This commitment is contained in **Chattanooga's Biosolids Management Policy**. Chattanooga has suffered no violations of the federal 503 code and received no NOVs in 2014.
2. Product: To provide biosolids that meet the applicable standards for their intended use or disposal—**The City of Chattanooga's biosolids product** is well established as meeting Class B requirements for land application.
3. Environmental Management System: To develop an environmental management system for biosolids that includes a method of independent third-party verification to ensure effective ongoing biosolids operations—Chattanooga has elected to remain in the NBP program and continue the certification process. The latest (year 5) reverification preparation/internal audit was completed in January 2014. All findings needing correction were **addressed through Chattanooga's Corrective and Preventive Action** procedure. The interim/internal **audit verified that Chattanooga's biosolids** program met the expectations and requirements of the NBP and as a result,

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Chattanooga continues with the designation of their BMS at Platinum level. The five year third party reverification audit took place sometime in the first quarter of 2015.

4. **Quality Monitoring:** To enhance the monitoring of biosolids production and management practices—The City of Chattanooga continues to conduct analytical laboratory tests beyond requirements to ensure product quality. A program of trend analysis was implemented in the last year with specific emphasis on metals content and vector attraction reduction. The City conducts biweekly inspections of application sites to ensure quality land application, and random inspections of land application contractor and subcontractor vehicles.
5. **Quality Practices:** To require good housekeeping practices for biosolids production, processing, transport, and storage, and during final use or disposal operations—Chattanooga has implemented new handling procedures for first-in first-out land application and for cold weather filter cake handling to minimize water vapor generation upon release of the cake from the filters. Procedures remain in place to keep the biosolids staging area clean and free of debris.
6. **Contingency and Emergency Response Plans:** To develop response plans for unanticipated events such as inclement weather, spills, and equipment malfunctions—Chattanooga’s BMS Emergency Preparedness and Response Plan, with emergency contact information in case of chemical release, fire, severe weather, or other unplanned event, was last updated effective January 8, 2015. **Synagro personnel have been trained in the city’s BMS EP&RP;** they also have their own spill response plan.
7. **Sustainable Management Practices and Operations:** To enhance the environment by committing to sustainable, environmentally acceptable biosolids management practices and operations through an environmental management system—**This commitment is contained in Chattanooga’s Biosolids Management Policy.** Since mid-2005, virtually all biosolids generated at the MBWWTP were beneficially reused by land applying at agricultural farmland and special locations such as Hiwassee Wildlife

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Refuge, Williams Island, and Prentice Cooper State Forest, thus saving landfill space and costs of about \$2 million per year, and reducing the City's carbon footprint. In addition, having been originally certified by a third party verification audit completed in February 2009, Chattanooga retained its BMS Platinum level certification by completing a reverification audit in January 2014.

8. Preventive Maintenance: To prepare and implement a plan for preventive maintenance for equipment used to manage biosolids and wastewater solids— Chattanooga completed implementation of the Maintenance and Reliability program, and as a follow up to that program, Chattanooga is providing training for mechanics and electricians through Chattanooga State Community College in preventive and lean maintenance practices. Plant assets used for biosolids processing and treatment are managed through Chattanooga's Computerized Maintenance Management System (CMMS), Cityworks, which has been modified to improve the work order system. A significantly bolstered staff is working hard to improve workflows, planning, and organization of preventive and corrective maintenance efforts.
9. Continual Improvement: To seek continual improvement in all aspects of biosolids management—Chattanooga is more effectively using the CAPA process by implementing problem-solving committees to address operational issues, e.g. filter press drain line problem. Going forward in 2015, the drive for continual improvement will focus on cost effectiveness of the processes involved in the biosolids value chain, primarily energy efficiency, potential revenue or cost offset, and reduction of offsite management costs.
10. Communication: To provide methods of effective communication with gatekeepers, stakeholders, and interested citizens regarding the key elements of each environmental management system, including information relative to system performance—Chattanooga has implemented the following methods to maintain open channels of communications with interested parties in the community:

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- The Sustainability Committee, comprised of farmers, environmental interest groups, regulatory agencies, MBWWTP management, land application contractor management and staff, industrial users, and other interested parties, receives all relevant correspondence from the Chattanooga BMS and is convened annually.
- Annual biosolids factsheet is published each February, and the annual newsletter is published each fall and distributed to all ISS department employees and interested parties. Both publications are also posted on the city's website.
- Annual Performance Report is published by May 1 each year, and is distributed to all employees, Sustainability Committee members, and other interested parties, and posted on the city website.
- Plant tours for classes from local schools are scheduled year-round, and a feedback questionnaire intended to solicit constructive criticism is provided to each school group leader.
- Exhibits are displayed at Miller Plaza and First Tennessee Pavilion/Farmers Market as part of Public Works week during the third week of May each year.
- The verification and interim audit reports are posted on both the city website and the NBP website (biosolids.org); internal audit reports are also posted on the city website.

Progress Toward Biosolids Program Goals & Objectives

Chattanooga established four overarching goals that are aligned with the NBP's four key outcomes, with several key objectives related to each goal. Quantitative measures indicative of progress to date (Key Performance Indicators) continue to be developed and reviewed by the Biosolids Management Team. Objectives and quantitative measures are revised each year.

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- **GOAL** Relations with Interested Parties.
- **OBJECTIVES & PROGRESS** Increase outreach attempts—all planned actions achieved except contact with area farm agency; Continue annual biosolids Sustainability Committee meetings—all planned actions achieved; Continue Moccasin Bend Wastewater Treatment Plant newsletter—planned action achieved.
- **GOAL** Biosolids Regulatory Compliance.
- **OBJECTIVE & PROGRESS** Achieve zero land application non-compliances—all planned actions achieved.
- **GOAL** Quality Management Practices in Biosolids
- **OBJECTIVE & PROGRESS** Cost effectiveness evaluation.
- **GOAL** Environmental Performance
- **OBJECTIVE & PROGRESS** Reduction of carbon footprint & reduce energy use

MANAGEMENT SYSTEM DYNAMICS & EFFECTIVENESS REVIEWS

Review of the management system dynamics and outcomes is intended to verify that the biosolids management system is functioning effectively and generating positive outcomes and that as the program matures it implements the changes brought about through the continuous improvement processes.

Significant Changes

The following personnel changes occurred over the last year at the Moccasin Bend facility: As of January Alice Cannella, who was previously appointed to the permanent position of Director-Waste Resources Division, retired. Mike Patrick was appointed to the permanent position of Director-Waste Resources Division.

Revisions to the Management System and Related Documentation

No structurally significant revisions other than the personnel changes noted above have been made in the Chattanooga Biosolids Management system since the previous audits. Minor edits for clarification and specificity have been made in the Manual to correctly reflect the Chattanooga management system.

Examination of Outcomes

The Chattanooga biosolids management system strives for continuous improvement in how biosolids activities are conducted and how those activities promote the four key outcomes.

Environmental Performance

The Modifications so that both digester boilers are able to use digester gas as an energy source continue, and the usage target for the digester gas was exceeded.

Implementation of the Strategic Energy Management Plan in the form of more efficient lighting, occupancy sensors, and other energy saving measures has resulted in reduction of the plant's energy costs and carbon footprint.

Use of plant water as a substitute for potable water in foam suppression of chlorine contact tanks saved over four million gallons a year of potable water.

Quality Management Practices

In 2014, Chattanooga implemented trend analysis focusing on metals concentrations and vector attraction reduction to ensure consistently high product quality.

Regulatory Compliance

Once again, in 2014, Chattanooga received no NOVs or violations of the federal 503 code in association with its biosolids management program. Chattanooga is well positioned to comply with the new state permitting requirements going forward in 2015.

Interested Party Relations

Biosolids BMS 2015 Internal Audit Report

City of Chattanooga Moccasin Bend Wastewater Treatment Plant, Chattanooga, TN

Chattanooga's outreach efforts far exceeded most of the annual targets, and continue to be particularly effective with plant tours for school groups, and collaboration with Chattanooga's Water Quality group in delivering presentations emphasizing the importance of clean water in today's society.

Correction of Nonconformances and Findings from Previous Audits

Two (2) of three (3) nonconformances and findings from previous audits remain open. Previous audits called for review of the effectiveness of the corrective actions taken.

- **Minor Nonconformance JS 14-01/8** The NBP BMP element 8 requires the organization to establish training program(s) to ensure employees are competent in performing their assigned biosolids management tasks and duties. There is evidence that employees are considered to be fully trained and qualified with some training noted as "incomplete".

Correction/Corrective Action: Locate any "incomplete" data on training forms – determine extent of problem – appropriate supervisor to retrain and re-document as necessary.

Effectiveness Review: TBD

- **Minor Nonconformance JS 14-02/8** The NBP BMP element 8 requires the organization to establish training program(s) to provide general awareness of the BMP and how each employee's assigned roles and responsibilities relate to the entire biosolids value chain, including new or reassigned employees. Employees hired or re-assigned since November 2013 have not received the necessary training.

Correction/Corrective Action: Train within 30 days all new hires that have yet to receive BMS training.

Effectiveness Review: The 6 employees have now been trained along with 6 new/reassigned employees starting after 4/3/2014 along with the EPRP training.

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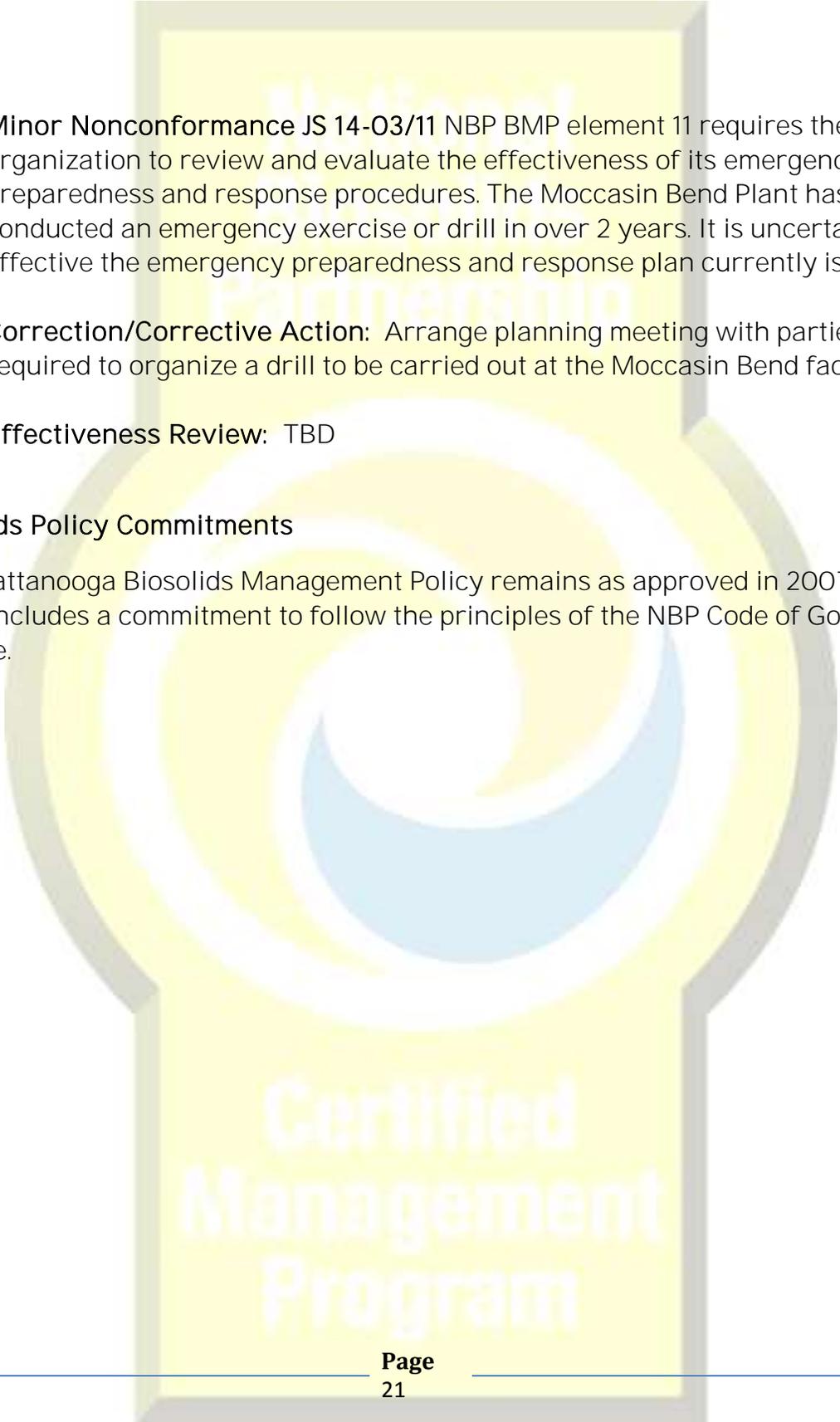
- **Minor Nonconformance JS 14-03/11** NBP BMP element 11 requires the organization to review and evaluate the effectiveness of its emergency preparedness and response procedures. The Moccasin Bend Plant has not conducted an emergency exercise or drill in over 2 years. It is uncertain how effective the emergency preparedness and response plan currently is.

Correction/Corrective Action: Arrange planning meeting with parties required to organize a drill to be carried out at the Moccasin Bend facility.

Effectiveness Review: TBD

Biosolids Policy Commitments

The Chattanooga Biosolids Management Policy remains as approved in 2007. The Policy includes a commitment to follow the principles of the NBP Code of Good Practice.



Certified
Management
Program

Appendix

Documents Reviewed

Pretreatment Standard Operating Procedures
Maintenance Job Safety Briefings
WRD Filter Press Operator Training Checklists
Solids Operations Standard Operating Procedures book
Laboratory Standard Operating Procedures Master List & book
Laboratory Employee Training checklist
Synagro Land Application Site Compliance Inspection Report
CoC Sustainability Committee Meeting Information Packet
Synagro Daily Truck Report
Synagro Safe Work Permit Hazard Identification & Risk Assessment Checklist
Synagro Standard Operating Procedures
Synagro Biosolids Spill Response Plan
2015 Chattanooga BMS Management Team meeting minutes
Chattanooga BMS Management Team agendas
RFP and Phase #1 Report for Economic Analysis and Planning of Solids Operations for MBWWTP
Synagro-MBWWTP Public Relations Plan for Biosolids Land Application
Chattanooga 2014 Biosolids Fact Sheet
MBWWTP BMS Newsletter, Vol. 5, September 2014
MBWWTP BMS Training Log
2014 BMS Inquiries Log
2014 BMS Complaints Log
BMS Emergency Preparedness & Response Plan training presentation
2014 BMS KPI log
MBWWTP BMS Information Stations
Management of Change form-State of TN Biosolids Land Application Permit (1/3/14)
State of TN Biosolids General Permit
March 2014 Filter Press Operator Data Report
Weekly Reports of 503 Laboratory Analysis
Monthly Biosolids Characteristics Reports

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Reference Documents

City of Chattanooga BMS Manual and Appendices
City of Chattanooga Biosolids Management Policy Statement
City of Chattanooga WRD Employee Health & Safety Handbook
TDEC Guidelines for the Land Application and Surface Disposal of Biosolids May 2010
NBP Biosolids EMS Guidance Manual
NBP Manual of Good Practice & Code of Good Practice
NBP Third Party verification Auditor Guidance
Reports from previously conducted independent third-party and internal audits

List of Participants

Mike Patrick	Director-Waste Resources Division, City of Chattanooga
Sandy Barbee	BMS Coordinator-City of Chattanooga ISS
Jo Miller	Occupational Safety Specialist-City of Chattanooga ISS
Jimmy Spence	Maintenance Supervisor-City of Chattanooga ISS
Marty Knight	Solids Ops. Supervisor-City of Chattanooga ISS
Rick Tate	Pretreatment Supervisor-City of Chattanooga ISS
Paul Patterson	Laboratory Manager-City of Chattanooga ISS
Charles Blow	Solids Operator 2-City of Chattanooga ISS
Aaron Loyd	Technical Services Manager-Synagro
Charlie Rains	Truck Driver-Synagro