

**NATIONAL BIOSOLIDS PARTNERSHIP  
INTERIM AUDIT REPORT**

**Louisville and Jefferson County  
Metropolitan Sewer District**

**Louisville Green Management System**

**Louisville, Kentucky**

**Audit conducted by**

**NSF-International Strategic Registrations**

**William R. Hancuff, Lead Auditor**

**References:**

**National Biosolids Partnership (NBP) *BMP Elements*  
NBP *Third Party Verification Auditor Guidance – November 2001*  
*(Latest Revision August 2011)*  
*NBP Code of Good Practice*  
**Louisville Green Management System Manual**  
**(Developed July 2006, Updated January 28, 2022)****

**FINAL INTERIM REPORT – February 2, 2023**

## **INTRODUCTION**

The purpose of the Biosolids Management Program (BMP) interim audits are to verify through regular reviews the system's health and effectiveness between verification audits. The third party on-site interim audits provide independent reviews and support credibility between re-verification audits. The goal of the audit is to collect and evaluate objective evidence related to a portion of the BMP such that over the course of the four interim audits conducted between verification audits all 17 elements are addressed.

The goal of this audit is to determine whether the Louisville and Jefferson County Metropolitan Sewer District (MSD) Louisville Green Management System (LGMS) is functioning as intended, that practices and procedures are conducted as documented, and that the BMP as implemented conforms to the NBP's Code of Good Practice and the BMP requirements of the National Biosolids Partnership (NBP) program objectives.

## **RECOMMENDATION**

The results of the LGMS eleventh interim audit is positive, and it is the recommendation of the audit team that the Louisville and Jefferson County Metropolitan Sewer District LGMS maintain its Platinum Plus Level Recognition Certification status.

## **AUDIT SCOPE**

The (NSF-ISR) conducted a third party interim audit of the MSD's LGMS from January 10 through January 12, 2023. The on-site audit team consisted of Dr. William R. Hancuff, Lead Auditor.

The primary objective of the annual interim audit was to ensure the environmental management system health by reviewing:

- Progress toward goals and objectives,
- Corrective and preventive action requests and responses.
- Actions taken to correct minor non-conformances,
- Management review process, and
- EMS outcomes (environmental performance, regulatory compliance, interested party relations, and quality practices)

The first four items identified above involved reviewing procedures, activities, processes and products that have general requirements found in the NBP standard elements 5, 14, 15, 16 and 17. The fifth item, BMP outcomes, had the potential of involving other NBP standard elements, namely: 1, 2, 4, 6, 9, 10 and 13.

In addition to evaluation of the system as outlined above, the present interim audit scope included the review and verification of the maintenance and implementation of the LGMS relative to standard elements 3, 10, and 13.

The physical biosolids facilities included in the audit and visited during the interim audit included the Morris Forman Water Quality Treatment Center and the Jackson Sod Farm in Shelby County. The physical biosolids facilities at the Morris Forman plant included in the audit and visited during the audit included the following biosolids value chain process area critical control points: preliminary/primary treatment, secondary treatment, digestion, digested solids dewatering, and solids heat drying.

The following individuals were interviewed or otherwise participated in meetings as part of the audit process:

Daymond M. Talley	Director Treatment Facilities
Amber Burdin	Process Support Supervisor
Robin Burch	Biosolids Manager
John Kessel	Assistant Director Treatment Facilities
James Skinner	Process Manager
Mike Scott	Operations Supervisor
Douglas Arthur Crurry	Operator, Process Technician III
Mathew “Bobo” Scott	Operator, Process Technician III
Kevin Darnell	Operator, Process Technician III
Harry Goodman	Operator, Process Technician II
Rich Jackson	Maintenance Planner
Kelly Rhodes	Training Manager
Sheryl Lauder	Communication Program Manager
Mike Hext	Waste Management (landfill contractor)
Steve Mink	Jackson Sod Farm – Shelby County, owner & farmer – user of biosolids product
Robin Green	Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste

## **INTERIM AUDIT FINDINGS**

The interim audit included review of the latest versions of relevant LGMS manual element procedures dated January 2022, and employed the most recent version of the NBP Third Party Verification Auditor Guidance dated August 2011. The audit found 2 positive observation, no major non-conformances, no minor non-conformances and 8 opportunities for improvement.

The following is a review of the positive observations made during the interim audit. The opportunities for improvement follow, and are listed by item number, which correspond to the element minimum conformance requirements found in the NBP Third Party Verification Auditor Guidance. These findings are presented in the sequence of the NBP standard elements.

## **Positive Observations**

The MSD management and all plant personnel involved in the biosolids environmental management system development should be recognized for their outstanding achievements, and the exceptional features of their Louisville Green Management System. The following is a summary of those positive observations made during the audit.

Element 1 – A number of changes have taken place in the MSD management and the organization of the Biosolids Management System. The Odor Control and Biosolids Program Manager, Robin Burch, has done an excellent job in transitioning her former responsibilities as the Louisville Green Management Representative to the Process Support Supervisor, Amber Burdin, who has excelled at fulfilling that leadership role in carrying out the responsibilities of the position.

Element 9 – The Communication Department continues to excel in providing relevant information about the biosolids management activities to interested parties and the general public through its “Streamline” monthly publication, and to employees and contractors through its “Current” monthly publication.

## **Opportunities for Improvement**

Requirement 5.6 – Consider morphing measurability of Objective 4 from producing 70 dry tons per day of biosolids to reducing the quantity of biosolids sent to landfill to zero.

Requirement 5.6 – Consider rewording the Objective related to pretreatment to: *Avoid landfill costs and reduce risk to end user of Biosolids by creating a training program for the Industrial Department by Dec 31<sup>st</sup> 2023 and measure results after training, to reflect the originally intended goal of Reducing the Concentration of Molybdenum at the influent to the plant to less than 0.15 mg/l.*

(Note: it was observed that if the influent is below this concentration level the molybdenum concentration in the pellets does not exceed the value requiring it to be diverted to the landfill.)

Requirement 5.6 – Consider at some time in the future establishing a goal and objective for optimizing the production of methane gas from the digesters. The gas produced by the digesters and used at the plant represents a cost savings associated with expenditures for natural gas.

Requirement 5.6 – Consider having the public relations personnel develop a goal and objective that directly relates to the “relations with interested parties” outcome area. This was first identified as an opportunity for improvement in the external audit of June 2018 and then again in the external audit of November 2019. Due to the failure to produce product it was decided to delay this goal until the startup of production again, which occurred in 2022.

Requirement 5.6 – Consider developing a goal and objective for specifically improving the ratio of planned preventive maintenance (routine work orders) activities to unplanned maintenance (corrective work orders) activities; e. g. the number of labor hours expended in completing preventive maintenance activities verses the number of labor hours expended in completing corrective work orders.

Requirement 8.1 – Consider including in the operator training program a field visit to a Louisville Green farm application site to reinforce the understanding by operators that their plant product is beneficially used and the importance of maintaining the highest quality product for their customers.

Requirement 11.2 – While Louisville conducts training and field exercises to evaluate the effectiveness of emergency preparedness and response procedures for hazardous materials they have not conducted similar exercises for incidents related to biosolids, to include preparation of written after action reports addressing corrective actions required and preventive actions proposed to eliminate recurrence of problems.

Requirement 12.2 – Clarify in the Louisville Green Management System Manual Element 12 procedure #4 that the official controlled version of documents are converted to .pdf files and placed on the M drive so they may not be altered by unauthorized individuals.

As a commitment to the requirement contained in the Code of Good Practice for continuous improvement, the opportunities for improvement will be addressed to the maximum extent possible.

### ***METROPOLITAN SEWER DISTRICT COMMENTS***

*The Louisville Green Staff at The Louisville and Jefferson County MSD is very happy to continue its recognition at the Platinum Plus Level of certification. The Audit performed by Dr. Bill Hancuff continues to be a value added experience to the Louisville Green Biosolids Management System. The minor nonconformance finding during the audit was fair and accurate. -- Robin Burch MSD Process Support Supervisor.*

### **OUTCOMES MATTER**

The Policy of the Louisville Green Management System of the Louisville and Jefferson County Metropolitan Sewer District (MSD) is simply summarized as “MSD will produce Exceptional Quality (EQ) biosolids and promote beneficial use.” The “EQ” rating has generated a highly marketable biosolids product.

The LGMS completely reevaluated its goals and revamped their program through establishing one main goal with supporting objectives to attain that goal. The goal is to “continually enhance the biosolids process to improve communication, efficiency, quality and sustainability through 2022.”

Presently there are four objectives focused on supporting and achieving this goal. The objectives were developed by the LGMS Core Team considering public input, and improved over time to more directly meet Specific, Measurable, Achievable, Relevant, and Time-bound (SMART) criteria. Each of the objectives were reviewed to determine their relevance to one or more of the four NBP required outcome areas below:

1. Environmental Performance,
2. Regulatory Compliance,
3. Relations with Interested Parties, and
4. Quality Biosolids Management Practices.

While it is not a requirement to fully attain all objectives, it is a critical component of the system to make progress towards accomplishing the overall goal. It should also be recalled that attainment of objectives is not the only measure of continual improvement, but corrective actions play a vital role in that measure as well.

The LGMS performance relative to each of its 2019 objectives and its progress in moving forward on its 2022 objectives are addressed below and the outcome areas affected by the objective are found at the end of each discussion.

**Objective 1: Implement an improved Preliminary Treatment System at the Morris Forman Water Quality Treatment Center by June 30, 2018 to Reduce the Amount of Debris Sent to the Anaerobic Digesters by 500 Tons through Increasing the Amount of Screen and Grit Captured by 500 Tons with Data Collection Completed by June 30, 2020.**

The facility's digesters accumulate inert and inorganic materials sufficient to reduce the effectiveness of the digestion process and require the digesters to be frequently cleaned at a substantial cost. Improving the preliminary treatment through installing new bar screens with reduced openings will remove considerably more materials than has historically been collected thus eliminating a portion of the inert materials that otherwise would pass through into the digesters and have deleterious effects on pumps and other processes downstream. Additionally redesigning the headworks grit removal system will have a measurable impact on the amount of inorganic material prevented from entering the digesters and reducing their effective treatment volume.

The amount of debris removed through the preliminary treatment processes has been historically measured by the amount of material collected in the waste lagers measured in number of loads and wet tons. The baseline used for comparison of improvement will be the years 2012 – 2014, which was 4,039.6 tons per year.

The construction contract for the new headworks was initiated in the middle of 2015. Progress on construction has been delayed and completion originally scheduled for the end of 2016 has been moved to late 2018. By November 2018 everything was fully operational, however in February 2019 the west headworks lost grit capture and as of November 2019 was still out of service. The largest quantity of grit arriving at the plant is

associated with storm events when the combined sewer diverts flow to the west headworks. The quantity of grit varied considerably on a seasonal basis and after two years of tracking the results were inconclusive as the grit collected did not significantly increase and the digester cleaning did not decrease, so this objective was closed in July 2021.

Outcome Areas: Environmental Performance and Quality Biosolids Management Practices.

**Objective 2: Maintain a Solids Inventory of Less Than 1.3 Million Pounds at the Morris Forman Water Quality Treatment Center to Prevent the Number of Yearly Odor Complaints to No More Than 8 during 2019.**

It has been observed that the larger the inventory of biosolids at the Morris Forman Water Quality Treatment Center Facilities the greater the possibility for odor generation and public complaints.

The short term action plan is to eliminate the contribution of biosolids from Non-Morris Forman Facilities from processing at the Morris Forman plant. It is planned to expand the Hide Plant through addition of a second centrifuge and sending the cake to a landfill; to add more centrifuges at Derek R. Guthrie (D.R.G.) Water Quality Treatment Center to handle the solids generated at Cedar Creek, Floyd Creek and D.R.G. (note D.R.G. recently removed 1.2 million gallons of 0.5% solids from Morris Forman). A longer term action plan is to add another dryer train at the Morris Forman Plant and ultimately design and construct a combined heat and power (CHP) facility.

Currently, each day the MF Laboratory analyzes process samples for the treatment plant to determine quantities of solids, which can be input to a spreadsheet. The spreadsheet was modified in October 2018 for use with this objective. Since that date the monthly average quantity of biosolids in millions of pounds has varied from 1.5 to 2.7. The solids reduction objective has not been attained and the number of odor complaints in calendar year 2019 through September was 9. When the dryers failed this objective was closed on 5 April 2021.

Outcome Areas: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

**Objective 3: At the Morris Forman Water Quality Treatment Center Process 1900 Dry Metric Tons of Biosolids each Month During Calendar Year 2019.**

This original objective was to be met through production of final solids product by either dewatering cake and sending to landfill or processing into Louisville Green for beneficial use, in order to meet secondary effluent permit conditions for TSS in calendar year 2019. Attaining this target was a challenge since solids processing operations failed and needed to be replaced. The monthly total solids production in 2019 exceeded 1900 dry tons in January and February but below 1900 tons in every month since then, with a

low of 1440 for two months. At the end of 2020 the total tons produced was 1037. When the dryers failed completely this objective was closed.

Outcome Areas: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

**Objective 4: Implement a New Biosolids Process at Morris Forman Water Quality Treatment Facility by December 31, 2022 to Produce 70 Dry Tons per Day of Class A Biosolids. (Note: Since the ultimate target of this objective is to have 100% of the biosolids product beneficially used, the objective was morphed into having zero biosolids product disposed in landfill by 2025.)**

The driver behind this objective was the aging infrastructure associated with the heat treatment process of stabilizing biosolids to meet Class A product. The energy cost and high operation and maintenance costs along side the inability to consistently maintain a quality product has led the district to evaluate alternative innovative yet demonstrated technologies for processing biosolids to reliably increase production from 1300 tons per month (44 tons per day) to 70 dry tons per day. A variety of alternatives were evaluated and a new thermo hydrolysis process was selected, which would have allowed abandonment of the antiquated failing heat drying system.

A final selection of a design-build contractor was made but the delay in the construction and operation of the new thermos hydrolysis process forced the installation of a new dryer, which could be accomplished more expeditiously. It is now planned to use both the dryer and thermos hydrolysis in series such that 100% of the solids will be used beneficially, and zero solids sent to landfill.

Outcome Areas: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

**2022 Objective 1: To Implement Preventive Maintenance System for New Dryers, creating Preventive Maintenance Work Orders by 1 July 22 for new dryer trains, and having 80% of required work orders completed within their life cycle for the first year of dryer operation ending December 31, 2023.**

(Note: This objective does not meet the fundamental criteria associated with continual improvement, since it is simply performing routine work as expected.)

**2022 Objective 2: To Avoid Landfill Costs and Reduce Risk to end users of Biosolids by creating a Training Program for the Industrial Waste Department by 31 December 2023 and measure results after training. (Note: Proposed revised title: Reduce the Concentration of Molybdenum in the WWTP Influent to Always be Below 0.15 mg/l by 31 December 2024.)**

The focus of this objective is to reduce the concentration of Molybdenum in the biosolids product to a level below which it would otherwise preclude land application (requiring diversion to a landfill.) An analysis of the concentration of Molybdenum in the



biosolids versus its concentration in the plant influent indicates that if the concentration in the influent is below 0.15 mg/l the concentration in the biosolids will be acceptable for land application. Therefore, this objective will be modified to read Reduce the Concentration of Molybdenum in the WWTP influent to always be below 0.15 mg/l by 31 December 2024.

The action plan for attaining this objective is to create a training program for the Industrial Waste Department to work with industries that contribute Molybdenum to the wastewater collection system to find substitutes for its use (with the possibility of establishing permit discharge limitations), and in the interim coordinate releases so that slug discharges of Molybdenum do not occur.

Outcome Areas: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

**2022 Objective 3: To Update all Outdated Standard Operating Procedures by 31 December 2023.**

After updating all SOPs that have not changes, with new format and new signatures; the principle action plan for this objective is updating each chapter of the 15-chapter SOP manual of the new dryer. The time for completion is 31 December 2023.

Outcome Areas: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

**2022 Objective 4: See original Objective 4.**

## **CONCLUSIONS AND RECOMMENDATIONS**

The results of the third party interim audit showed the Louisville and Jefferson County Metropolitan Sewer District has a strong mature Environmental Management System and has only to address the identified Opportunities for Improvement. Therefore, it is the recommendation of the audit team that the Louisville Green Environmental Management System of Louisville, KY maintain its platinum plus level recognition certification status.

As was mentioned previously, a BMP is a continuously improving process, and retention of certification status is not the end. The results of this and future audits will provide value added to the system and should be viewed as an overall opportunity to improve. Every audit is a snapshot in time, and does not, or cannot, identify each and every area for improvement. And yet, while no single audit identifies all of the areas for improvement the results of each audit provide an additional incremental step in the overall system's improvement.

The scope of each interim audit must include a review of the organization's progress toward goals and objectives; BMP outcomes (environmental performance, regulatory

compliance, interested party relations, and quality practices); actions taken to correct minor nonconformances; the management review process; and corrective and preventive action requests and responses. This review generally includes requirements found in elements 1, 2, 5, 6, 9, 14, 15, 16 and 17.

In order to address each element of the NBP standard over the four years of interim audits the following elements are scheduled over the period between verification audits:

Year 11 (completed) – Elements 2, 5, 6, and 9.

Year12 (internal) – Elements 1, 4, and 8.

Year13 (completed) – Elements 3, 10, and 13.

Year 14 (internal) – Elements 7, 11, and 12.

Year 15 (third party) – Re-Verification audit

## **Attachment 1**

### **Documents and Other Objective Evidence Reviewed During the Interim Audit**

#### Element 1. BMP Manual

- LGMS Manual Introduction, Rev 022, date 1-28-22.
- LGMS Manual – Appendix G: Glossary of Terms, Rev. 019, date 1-28-22.
- LGMS Manual – Appendix H: Revision Log, Rev 028, date 1-25-22; updated 1-3-2023.
- Interviews with Daymond M. Talley, Director Treatment Facilities; Robin Burch, Biosolids Manager, Amber Burdin, Process Support Supervisor, and John Kessel, Assistant Director Treatment Facilities.

#### Element 2. Biosolids Management Policy

- LGMS Manual – Element 2 – Biosolids Management Policy, Rev 022, date 1-28-22.
- LGMS Manual – Appendix A: Code of Good Practice, Rev 019, date 1-28-22
- LGMS Manual – Appendix G: Glossary of Terms, Rev 019, date 1-28-22.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.

#### Element 3. Critical Control Points

- LGMS Manual – Element 3 – Critical Control Point, Rev 019, date 1-29-22.
- LGMS Manual – Appendix 3A – List of Critical Control Points and Operational Controls, Rev 031, date 12-29-22.
- Interviews with Daymond M. Talley, Director Treatment Facilities; John Kessel, Assistant Director Treatment Facilities, Robin Burch, Biosolids Manager; and Amber Burdin, Process Support Supervisor.
- Interview with Mike Hext, Waste Management (landfill contractor)
- Interviews with James Skinner, Process Manager; Mike Scott, Operations Supervisor; Douglas Arthur Crurry, Operator, Process Technician III; Mathew “Bobo” Scott, Operator, Process Technician III; Kevin Darnell, Operator, Process Technician III; and Harry Goodman, Operator, Process Technician II.
- Interview scheduled with Steve Mink, Sod farm owner & farmer, user of biosolids product
- Reviewed Morris Forman Water Quality Treatment Center Plant Flow Diagram and aerial view.

#### Element 4. Legal and Other Requirements

- LGMS Manual – Element 4 – Legal and Other Requirements, Rev 019, date 1-28-22.
- LGMS Manual – Appendix 4A: List of Legal and Other Requirements, Rev 024, date 12-12-22.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interview with regulators – Robin Green, Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste.
- Discussed compliance record and on-site inspection of MSD with DEP personnel.

#### Element 5. Goals and Objectives

- LGMS Manual – Element 5 – Goals and Objectives, Rev 021, date: 1-28-22.
- LGMS Manual – Appendix 5B: Goals and Objectives Action Plan and Traking Spreadsheet Form, Rev 003, date 7-26-14.
- LGMS Manual – Appendix 5A: Goals and Objectives for 2019, Rev 019, date: 10-19-18.
- LGMS Manual – Appendix 5A: Goals and Objectives for 2022, Rev 022, date: 5-24-22.
- LGMS Manual – Appendix 5A: Goals and Objectives for 2023, Rev 024, date: 12-24-22.
- LGMS Manual – Appendix 5B: Goals and Objectives Action Plan and Tracking Spreadsheet for 2022 Objectives 1, 2, 3, and 4, dated: 8-23-22.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Reviewed the following for past goal progress: cake production data for 2019, 2020, 2021 and 2022 and digester cleaning record - 2010 through 2022 for digesters 1 through 4.
- Reviewed progress on each goal and objective for 2022.
- Louisville Green Program Performance Report for 2019 dated 9 March 2020.

#### Element 6. Public Participation in Planning

- LGMS Manual – Element 6 – Public Participation in Planning, Rev 021, date: 1-28-22.
- LGMS Manual – Table 6.1 – Identification of Formal and Informal Participation Mechanisms.
- LGMS Manual – Appendix 6A: List of Interested Parties, Rev 014 date: 12-16-22.
- LGMS Manual – Element 9 – Communication, Rev 020, date: 1-28-22.

- Interested Parties letter notification: invitation to attend third party independent audit of MSD Biosolids Management Program audit for 2023, dated December 16, 2022.
- Viewed <https://louisvillemmsd.org/louisvillegreen>
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interview with Sheryl Lauder, MSD Communication Program Manager
- Interview with regulators – Robin Green, Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste.
- MSD – Louisville Green Management System website (<http://www.msdlouky.org/>)
- Farmer Outreach Flier.
- Multi-color single sheet presentation of MSD Policy and Code of Good Practice.
- Louisville Green Program Performance Report for 2019 dated 9 March 2020.

#### Element 7. Roles and Responsibilities

- LGMS Manual – Element 7 – Roles and Responsibilities, Rev 026, date: 1-28-22.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interviews with James Skinner, Process Manager; Mike Scott, Operations Supervisor; Douglas Arthur Crurry, Operator, Process Technician III; Mathew “Bobo” Scott, Operator, Process Technician III; Kevin Darnell, Operator, Process Technician III; and Harry Goodman, Operator, Process Technician II.
- Interview scheduled with Steve Mink, Sod farm owner & farmer, user of biosolids product.

#### Element 8. Training

- LGMS Manual – Element 8 – Training, Rev 019, date: 1-28-22.
- LGMS Manual – Appendix E: Employee Training Program Guidelines, Rev 021, date 1-28-22.
- Interview with Kelly Rhodes, Training Manager.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interviews with James Skinner, Process Manager; Mike Scott, Operations Supervisor; Douglas Arthur Crurry, Operator, Process Technician III; Mathew “Bobo” Scott, Operator, Process Technician III; Kevin Darnell, Operator, Process Technician III; and Harry Goodman, Operator, Process Technician II.
- Discussed improvements in Learning Management System (LMS)

- Discussed e-module prepared for Emergency Response at Morris Foreman Facility.
- Discussed e-module prepared for annual LGMS training .
- Discussed annual on-board training for the Board

#### Element 9. Communications

- LGMS Manual – Element 9 – Communication, Rev 020, date: 1-28-22.
- LGMS Manual – Element 6 – Public Participation in Planning, Rev 021, date: 1-28-22.
- LGMS Manual – Table 6.1 – Identification of Formal and Informal Participation Mechanisms.
- LGMS Manual – Appendix 6A: List of Interested Parties, Rev 014 date: 12-16-22.
- Viewed <http://louisvillemsd.org/programs/louisvillegreen/documents>.
- Discussed MSD “Current News” employee newsletter for internal communication
- Discussed MSD “Streamline” news and events of Louisville MSD external monthly newsletter.
- Reviewed MSD information sheets related to what to flush and what not to flush
- Interview with Sheryl Lauder, MSD Communication Program Manager
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interview with regulators – Robin Green, Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste.
- Viewed MSD – Louisville Green Management System website ([http://www.msdlouky.org/programs/envir\\_man\\_sys.htm](http://www.msdlouky.org/programs/envir_man_sys.htm)).
- Discussed process for news releases – TV, radio, newspapers, electronic blasts, public service announcements; 75,000 email list and snail mail 265,000 inserts into water bills..
- MSD flyer brochure - Keeping Biosolids Safe – Preventing Molybdenum Pollution.
- MSD flyer brochure – Earth Friendly Soil Enhancing 5-3-0 fertilizer – Louisville Green.
- MSD flyer brochure – Odor Control – Helpful Options.
- Interview with Mike Hext, Waste Management (landfill contractor).
- Louisville Green Program Performance Report for 2019 dated 9 March 2020.

#### Element 10. Operational Control of Critical Control Points

- LGMS Manual – Element 10 – Operational Controls, Rev 020, date: 1-28-22.
- LGMS Manual – Element 3 – Critical Control Point, Rev 019, date 1-29-22.
- LGMS Manual – Appendix 3A – List of Critical Control Points and Operational Controls, Rev 031, date 12-29-22.

- LGMS Manual – Element 13 – Monitoring and Measurement, Rev 019, date 1-28-22.
- Reviewed Operations Documentation for Dewatering Chapter 13, Rev 1, date: 1-22-22.
- Reviewed Operations Documentation for Dryers Chapter 4, Rev 004, date: 11-02-22.
- Site visit to Jackson Sod Farm application site of Steve Minx in Shelby County, KY.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interviews with James Skinner, Process Manager; Mike Scott, Operations Supervisor; Douglas Arthur Curry, Operator, Process Technician III; Mathew “Bobo” Scott, Operator, Process Technician III; Kevin Darnell, Operator, Process Technician III; and Harry Goodman, Operator, Process Technician II.
- Interview with Mike Hext, Waste Management (landfill contractor).
- Discussed Hansen Maintenance Management System and staff performance record on work order processing and completion.

#### Element 11. Emergency Preparedness and Response

- LGMS Manual – Element 11 – Emergency Preparedness and Response, Rev 019, date: 1-28-22.
- Interviews with John Kessel, Assistant Director Treatment Facilities, Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interview with Mike Hext, Waste Management (landfill contractor).
- Discussed routine work orders for bi-weekly inspection of spill kits.
- Discussed e-module prepared for Emergency Response at Morris Foreman Facility.

#### Element 12. BMP Documentation and Document Control

- LGMS Manual – Element 12 – Documentation, Document Control and Recordkeeping, Rev 021, date: 1-3-23.
- LGMS Manual – Appendix B: List of Controlled Documents, Rev 020, date: 1-28-22.
- LGMS Manual – Appendix D: List of External Records, Rev 020, date: 1-28-22.
- LGMS Manual – Appendix H: Revision Log, Rev 028, date: 1-25-22.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interview with Mike Hext, Waste Management (landfill contractor).

### Element 13. Monitoring and Measurement

- LGMS Manual – Element 13 – Monitoring and Measurement, Rev 019, date 1-28-22.
- LGMS Manual – Element 10 – Operational Controls, Rev 020, date: 1-28-22.
- LGMS Manual – Element 3 – Critical Control Point, Rev 019, date 1-29-22.
- LGMS Manual – Appendix 3A – List of Critical Control Points and Operational Controls, Rev 031, date 12-29-22.
- Reviewed Operations Documentation for Dewatering Chapter 13, Rev 1, date: 1-22-22.
- Reviewed Operations Documentation for Dryers Chapter 4, Rev 004, date: 11-02-22.
- Reviewed Weekly Odor Survey Form Rev 000 date 9-17-2018.
- Reviewed cake production data for 2019, 2020, 2021 and 2022.
- Reviewed digester cleaning record - 2010 through 2022 for digesters 1 through 4.
- Reviewed screen and grit totals for past 10 years -2012 – 2021.
- Site visit to Jackson Sod Farm application site of Steve Minx in Shelby County, KY.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interviews with James Skinner, Process Manager; Mike Scott, Operations Supervisor; Douglas Arthur Crurry, Operator, Process Technician III; Mathew “Bobo” Scott, Operator, Process Technician III; Kevin Darnell, Operator, Process Technician III; and Harry Goodman, Operator, Process Technician II.
- Interview with Mike Hext, Waste Management (landfill contractor).
- Discussed Hansen Maintenance Management System and staff performance record on work order processing and completion.

### Element 14. Nonconformances: Preventive and Corrective Action

- LGMS Manual – Element 14 – Nonconformances - Preventive and Corrective Action, Rev 019, date: 1-28-22.
- Interviews with John Kessel, Assistant Director Treatment Facilities, Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- Interview with regulators – Robin Green, Supervisor, Kentucky Department of Environmental Protection, Division of Waste Management, Solid Waste.
- Reviewed National Biosolids Partnership Louisville Green Management System Internal Audit Report dated December 20, 2022 for audit conducted December 1, 2022.
- Reviewed Appendix 14B: Corrective Action Plan Form, Rev004, date: 12-28-22.
- Reviewed status of Corrective Actions from audits for 2022.
- Discussed status of Corrective Action Plan for Agreed Order Case 150220 from May 2018.



#### Element 15. Biosolids Management Program Report

- LGMS Manual – Element 15 – Biosolids Management Report, Rev 019, date: 1-28-22.
- Louisville Green Program Performance Report for 2019 dated 27 March 2020.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.

#### Element 16. Internal BMP Audit

- LGMS Manual – Element 16 – Internal Audits, Rev 022, date: 1-28-22.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.
- National Biosolids Partnership Louisville Green Management System Internal Audit Report dated December 20, 2022 for audit conducted December 1, 2022.

#### Element 17. Management Review

- LGMS Manual – Element 17 – Management Review, Rev 019, date: 1-28-22.
- Reviewed Louisville Green Management Review Scope (agenda) held March 27, 2020 for calendar year 2019.
- Reviewed Minutes of Management Review Team Meeting held March 27, 2020.
- Interviews with Daymond M. Talley, Director Treatment Facilities and John Kessel, Assistant Director Treatment Facilities.
- Interviews with Robin Burch, Biosolids Manager and Amber Burdin, Process Support Supervisor.