



Raleigh Water
Resource Recovery Division
EMS Manual



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Environmental Management System Manual
Records of Revisions

Document Control Log		
Title	Approved By:	Approval Date
Biosolids EMS Manual	Marti Gibson, EMS Coordinator	Oct 1, 2005
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06	Condensed and streamlined entire EMS manual to more closely reflect current practices and reduce overall size of manual.	Jan 21, 2009
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14	Revamped entire manual to more process-oriented manual	1/15/2015
15	Revisions to Memorandum of Understanding to cover ISO 14001:2004 requirements (associated EMS manual document); revised manual to reflect changes to Memorandum of Understanding	5/5/15
16	Revisions to glossary	8/26/15
17	Revisions to Scope, signature page, and overall changes to include entire Resource Recovery Division	11/12/15
18	Revisions to entire manual to comply with ISO 14001:2015 standards	2/2/17
19	Revisions resulting from annual manual review and audit processes	1/11/18
20	Revisions resulting from annual review and audits	1/9/19
21	Revisions resulting from annual review and audits	1/8/2020
22	Revisions resulting from audits	4/27/2020
23	Revisions resulting from annual manual review	1/21/2021
24	Revisions resulting from annual review	1/21/2022

Raleigh Water
 Environmental Management System Manual

EMS Sections	ISO 14001
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The initial copy of this Resource Recovery Division's (RRD) Environmental Management System (EMS) Manual has been approved by the Raleigh Water Director (see below for signatures). Future revisions to the manual can be made by the EMS Coordinator in conjunction with the EMS Team.

All requirements of this manual apply to the Wastewater Program in the Resource Recovery Division's service area and meet the minimum requirements of the ISO 14001:2015 National Standards.

Revised manual approval:

Whit Wheeler

Whit Wheeler
Interim Raleigh Water Director

January 21, 2022

Introduction

Environmental management for the Resource Recovery Division is a strategic priority. The EMS is intended to produce continual program improvement through the establishment of the following outcomes, consistent with Raleigh Water's Business Plan:

- a. Customer Satisfaction**
Provide reliable, responsive, and professional services and products that meet or exceed regulatory compliance and customer needs.
- b. Employee Leadership and Development**
Recruit, develop, and retain a diverse, competent, safety-focused workforce and invest in opportunities for professional and leadership development, considering the different needs and expectations of our workforce.
- c. Enterprise Resiliency**
Actively anticipate and respond to the risks affecting resources, systems, and operations as well as seek ongoing performance improvements to deliver quality services, ensure business continuity, and reduce environmental impacts.
- d. Infrastructure Strategy and Performance**
Maintain and enhance assets over the long-term by planning for equitable and inclusive infrastructure improvements and investments consistent with community needs, anticipated growth, and system reliability.
- e. Stakeholder Understanding and Support**
Actively informs and involves stakeholders to promote an appreciation of the value and life cycle of water and the services provided by the Utility and fosters welfare and sustainability within the community.

Scope

The Resource Recovery Division's Environmental Management System (EMS) applies to pretreatment, collective treatment of wastewater, production of biosolids, effluent discharge, and beneficial reuse of products (biosolids and reclaimed water).

Boundaries include the Neuse River Resource Recovery Facility, Little Creek Resource Recovery Facility, Smith Creek Resource Recovery Facility, pretreatment program, reclaimed water, biosolids, effluent, and pump stations in the Resource Recovery Division's service area.

Purpose

Raleigh City Council adopted a resolution endorsing the City's development of a wastewater EMS (Appendix B). Responsibility for oversight of the EMS lies with the EMS Representative (EMR), sponsored and supported managerially by the Raleigh Water Assistant Director who has the authority to commit resources and people to wastewater management activities. The EMS manual is approved by the Raleigh Water Director. Future revisions and maintenance of the manual can be made by the EMR in conjunction with the EMS Team.

Planned Arrangements

The EMS is based on the ISO 14001:2015 American National Standards.

EMS Manual

Procedure

Review and Approval

1. Review manual and appendices at least annually or when major changes occur in treatment processes, equipment, or other relevant areas (EMS Team).
2. Recommend and review any updates and other changes at EMS team meetings.
3. Update manual and appendices with approved changes (EMR).

Communication and Revisions

1. Communicate revisions to the EMS manual to the EMS team (EMR).
2. Post EMS manual on the City's website and the Raleigh Water shared drive.
3. Control manual so that changes can be made only by the EMR or designee.

Context to the Organization

Internal and External Influences

Internal and external influences on the EMS are identified by the EMS team utilizing various resources. This list of resources includes:

- Citizen Contact Tracking Log
- Contact lists for Reuse, Biosolids, and Pretreatment
- Stakeholder Meetings
- Electronic Links on City Website (provides ways for stakeholders to contact us and provide feedback)

External influences are customer service related/focused and align with Raleigh Water's Business Plan, which highlights the desire to become a world-class utility. External influences include regulatory compliance, customers/end users, environmental conditions, and social, political, and competitive circumstances.

Internal influences include Process Control Points and associated Operational Controls (Appendix C).

Monitoring of internal and external influences is achieved by the EMS team annually reviewing the stakeholder list and responding to those who attend stakeholder meetings; maintaining the Citizen Contact Tracking Log for feedback; and considering feedback and input when establishing Objectives & Initiatives and Significant Environmental Aspects. All input received is discussed during management review to ensure both internal and external influences are considered when moving toward becoming a world-class utility.

Interested Parties

Interested parties that are relevant to the Environmental Management System are determined by the EMS Team. Discussions take place based on historical information, knowledge of the requirements of the EMS related to interested parties, and consideration of known interested parties. Once the interested parties have been identified, the relevant needs and expectations (requirements) of the interested parties are determined. Additionally, methods by which the expectations will be managed are documented. The EMS team also determines which of the interested party expectations become compliance obligations (Appendix E).

Communication with internal and external interested parties is also a component of the EMS. Input from stakeholders and interested parties is considered when making decisions

regarding the wastewater management program, setting program objectives and initiatives, and identifying risks and opportunities for continual improvement of the EMS.

Leadership

Resource Recovery Division's Environmental Policy Statement

The Resource Recovery Division recognizes the responsibility to protect the environment and public health focusing on products for beneficial reuse by:

- meeting or exceeding compliance obligations
- seeking continual improvement in all operations
- promoting positive relations with interested parties
- protecting the environment, including prevention of pollution

Approved: July 23, 2004

Revised: January 8, 2020

Signed: *Robert Massengill*, Raleigh Water Director

Procedure

- Communicate policy to affected staff, relevant contractors, and interested parties.
- Post the policy statement on the City's intranet and website (www.raleighnc.gov).
- Train affected employees on the EMS policy. Employees are expected to comply with the letter and intent of this policy.
- Review policy as required in the Management Review process.

Leadership and Commitment

EMS's top management, which includes the Raleigh Water Assistant Director for Wastewater and the Resource Recovery Division Manager, is responsible for the establishment, integration, and effectiveness of the EMS. Top management ensures that the EMS achieves intended outcomes, promotes continual improvement, supports employee contribution to the EMS, and supports other managers in their leadership as it applies to their areas of responsibility.

Roles and Responsibilities

Purpose

To define the roles and responsibilities for staff and contractors performing EMS functions. Other sections and related documents also describe roles and responsibilities where relevant to certain procedures (See Appendices F & G).

Raleigh Water Director

- Top management with responsibility and authority for oversight of Raleigh Water

Raleigh Water Assistant Director for Wastewater

- Top management for oversight of wastewater management for the department.

Resource Recovery Manager

- Overall management of the Resource Recovery Division and the environmental performance of the plant.

EMS Team

- RRD program managers and supervisors. Reviews and implements EMS within the programs they manage

EMS Senior Management Team

- Participates in management review of EMS

Management System Coordinator

- Overall responsibility for implementing and monitoring the EMS

Environmental Management Representative (EMR)

- Facilitates and coordinates EMS activities and reports performance for management review

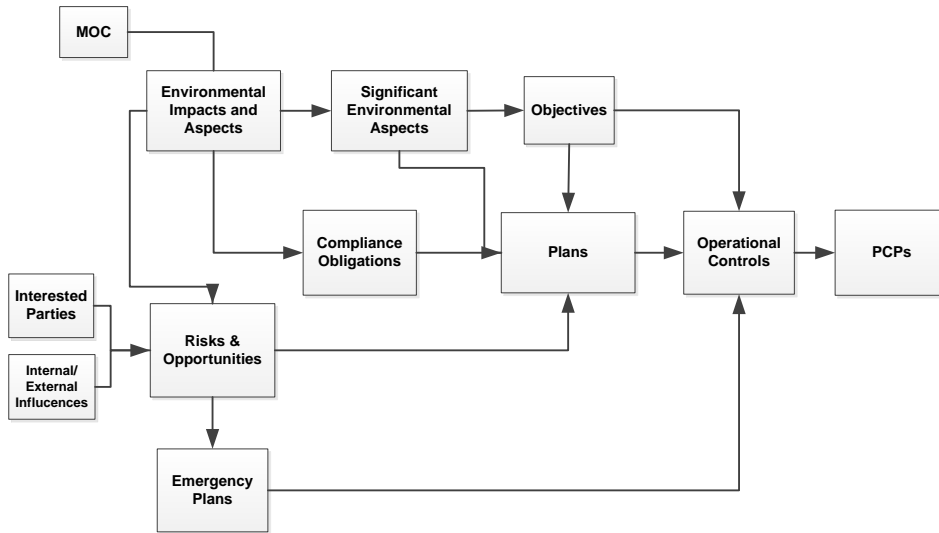
Contractors, Vendors and Suppliers

- Provide materials and supplies for the effective operation and maintenance of the RRD. Comply with policies and procedures of the Resource Recovery Division as listed in service agreements, contractor letters and Memorandum of Understanding for contracted activities relevant to wastewater management.

Procedure

1. Roles and responsibilities for staff (including contractors) that are specific to the EMS are assigned to the Resource Recovery Manager and the EMR. They are reviewed and updated as necessary on an annual basis.
2. The Resource Recovery Manager and the EMR will also review existing roles/responsibilities whenever significant operational changes are made. Revisions to the roles and responsibilities tables are made by the EMR.

Planning



In order to address program components such as environmental aspects and impacts, compliance obligations, objectives and initiatives, interested party input, emergency plans, internal/external influences, and risks and opportunities, the EMS team meets on a monthly basis to discuss and review any changes. Intended outcomes are considered when identifying these program components.

Significant environmental aspects are reviewed periodically as determined by the EMS team or when changes in processes occur. Changes in processes may occur due to a change in the City's Strategic Plan, Raleigh Water's Business Plan, or directives passed down from City Council.

Action plans to address risks are identified and considered when establishing objectives and initiatives. Interested party input and internal/external influences are also included in the plans to address risks.

The process control points, significant environmental aspects, and operational controls (Appendix C) are utilized to determine objectives and initiatives and risks and opportunities (see Operational Controls). Objectives and initiatives are reviewed every other month by the EMS team to evaluate improvement and are directly linked to the significant environmental aspects. Effectiveness of these components is reviewed during management review.

Environmental Aspects and Impacts

Purpose

To identify environmental aspects and impacts within the EMS that could potentially have an environmental impact, either positive or negative.

Procedure

1. The EMS team shall identify and document (Appendix D) environmental aspects and impacts that it has control or influence over, while considering historical data, staff experience, system knowledge, public input, and compliance obligations.
2. Where reasonable, consider both direct and indirect impacts.

3. Following identification of aspects, assign an impact rating (low, medium, or high) for significance in the areas of overall impact, business effect, severity, and scale of impact to determine significance. Aspects with ratings of medium or high or have a high likelihood of improvement are considered significant. The team also deemed compliance obligations as significant.
4. Document life cycle perspective for each aspect.
5. The criterion for determining significance is based upon the opinion, reasonable judgment, and consensus of the EMS team members. When determining the significance of environmental aspects, the EMS team considers:
 - the level of Resource Recovery control or influence
 - new or modified developments
 - activities, products, or services
 - normal and abnormal conditions
 - reasonably foreseeable emergency conditions
 - past environmental incidents (experience/history)
 - regulations
 - business impact, severity, or scale (direct/indirect)
5. Document identified significant aspects and action plans to address them (Appendix D & J).
6. Plans to address significant environmental aspects include following established procedures, incorporation into objectives and initiatives, interested party input, internal and external influences, and risks and opportunities.
7. Environmental aspects and impacts will be reviewed by the EMS team at least annually or when major changes occur to processes, equipment, or other relevant areas.

Risks and Opportunities

Purpose

To identify risks to EMS operations that could impede or hinder the ability to achieve the intended outcomes and continual improvement, as well as to identify opportunities for continual improvement.

Procedure

1. The EMS team will consider the level of control of influence, normal and abnormal conditions, reasonable and foreseeable emergency conditions, life cycle, and past environmental incidents when identifying risks and opportunities.
2. Risks are assessed according to the criteria of frequency, severity, and probability. Values of 1-5 are assigned based upon history, experience, and reasonable judgment of the EMS team; items with a value of 9 or above were deemed significant.
3. The EMS team shall determine action plans to address risks and opportunities to avoid and/or mitigate risks or improve upon opportunities.
4. Note occasions where the Division does not have a degree of management control or influence over the risk for future review.
5. Consider both harmful and beneficial environmental impacts when determining risks.
6. Consider and incorporate risks into objectives and initiatives.
7. The EMS team will incorporate and implement the action plans in the EMS process and evaluate the effectiveness of these actions.
8. Review the Division's activities and risks at least annually, or when major changes occur to processes, equipment, or other relevant areas.

Compliance Obligations

Purpose

To identify compliance obligations and changes in regulatory compliance issues that are applicable to the Resource Recovery Division and to monitor compliance of contractors.

Procedure

1. The EMS team will identify compliance obligations for the Resource Recovery Division through networking, communication with regulatory agencies, professional associations and publications, management review process, needs and expectation of interested parties, and any other available means.
2. Establish, document, and maintain operational controls for process control points to ensure regulatory compliance with compliance obligations (Appendix C).
3. Document compliance obligations (Appendix C).
4. Address all noncompliances through the corrective action process.
5. To ensure compliance obligations are met, periodic inspections or audits are conducted by North Carolina State regulators. Evaluation of conformance with the EMS is conducted once per certification cycle.

Monitoring Regulatory Compliance of Contractors

1. Contractors are to adhere to applicable regulatory and other requirements as stated in contract agreements and Memorandum of Understanding.
2. Contract liaisons will monitor, record, and identify regulatory compliance or noncompliance of contractors during site inspections.
3. Contractors will be notified by the EMR of any regulatory or contractual changes via various methods including electronic communication, face to face meetings, and Management of Change (MOC) process.
4. Contractors must notify the EMR, appropriate EMS staff, and the local office of NCDENR of any regulatory noncompliance.
5. Contractors will notify the EMR and the Resource Recovery Manager for contractual (non-regulatory) noncompliances.
6. Address all noncompliances through the corrective action process.

Objectives and Initiatives

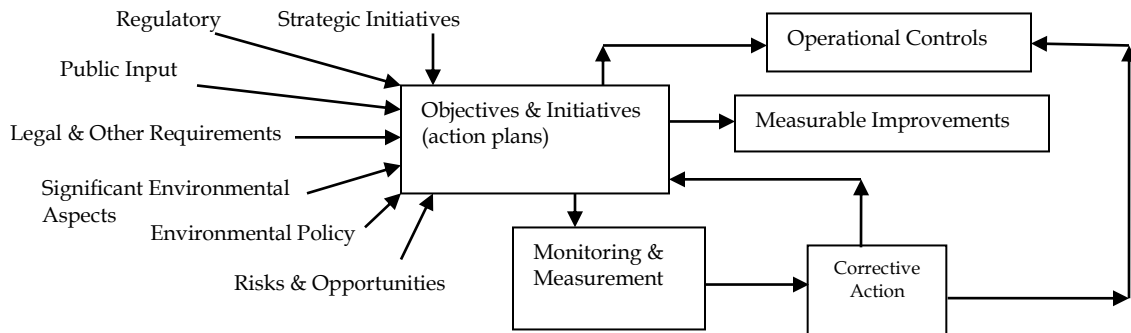
Purpose

To establish objectives and initiatives for continuous improvement of the EMS

Procedure

1. Establish objectives and initiatives for the EMS program annually (fiscal year) that support performance improvements in five key outcome areas:
 - Customer Satisfaction
 - Employee Leadership and Development
 - Enterprise Resiliency
 - Infrastructure Strategy and Performance
 - Stakeholder Understanding and Support
2. Develop objectives and initiatives using the SMART criteria and that are consistent with the EMS.
3. Consider and incorporate management policy, significant environmental aspects, risks and opportunities, compliance obligations, input received from interested parties, technological options, and financial, operational, and business requirements applicable to the EMS.

4. Present draft objectives and initiatives to interested parties for review and/or comment; final objectives and initiatives will be posted on Raleigh Water's website.
5. Develop an action plan assigning responsibilities, timeframes, and necessary resources for established objectives and initiatives.
6. At scheduled intervals, the EMS team will monitor progress toward objectives and initiatives and evaluate results at management reviews and internal audits. Consider objectives and initiatives and make recommendations during annual budget development process for appropriate resources.
7. Corrective action process may be used if progress is considered inadequate.



Management of Change

Purpose

To identify and address when there are changes in conditions, regulations, or other requirements, or when new development occurs that affects operations of the Resource Recovery Division.

Procedure

1. Monitor for changing conditions, requirements, or regulations that require modification to the operation of the Resource Recovery Division.
2. Assess divisional processes affected by changing conditions or requirements and review initiation of those changes at EMS team meetings.
3. Assign staff to design and implement the changes.
4. Document the changes using Management of Change form and implement approved changes.
5. Update procedures and documents per established procedures.
6. Notify the third-party auditor of any significant changes to the EMS.
7. Retrain affected staff and contractors on revised EMS procedures and practices as soon as practical (EMS team and appropriate supervisors).

Support

The Resource Recovery Division will provide the necessary resources for the EMS. Resources include, but are not limited to human resources, technology, specialized skills, and financial support. These resources are needed for the effective functioning and improvement of the EMS. This will be verified by establishing a training program, conducting internal audits, holding regular scheduled management reviews, and fulfilling the roles and responsibilities of the EMS team.

Competence and Awareness

To identify, track and provide training activities to ensure competency of staff in wastewater management activities and EMS functions, including training activities of contractors.

Procedures

Competence

1. Assess staff competency in performing their assigned wastewater management responsibilities using some or any of the following methods.
 - Job descriptions
 - Oral or written tests
 - City of Raleigh annual employee performance reviews
 - Communication
 - On the job observations and compliance audits
2. Provide additional training in areas where skill may need to be improved when competency is determined to be inadequate.

Awareness

1. Conduct awareness training on the WEMS at least annually, promoting awareness of environmental aspects, policy, SOPs and MOCs through discussions at staff meetings and Division meetings.
2. Conduct awareness training with new and transferred employees on policy and general EMS awareness as part of employee orientation (supervisors).
3. Post EMS policy at various locations throughout the facility.
4. Notify contractors of the environmental policy and require establishment of their own training program consistent with the EMS. Contractor personnel training requirements will be monitored on a periodic basis and reported to the contract liaisons.
5. Conduct awareness training on facility emergency action procedures.
6. Provide employees general awareness of environmental policy; significant aspects; their contribution to the effectiveness of the EMS; benefits of the EMS; implications for not conforming to EMS requirements and not fulfilling compliance obligations.

Recordkeeping

1. Document attendance at EMS training sessions and maintain records.
2. Maintain employee training records containing certifications and/or attendance sheets for training sessions attended, both inside and outside of Raleigh Water.
3. Contractor training records are maintained by the respective contractors' human resources divisions, as defined in service agreements and Memorandum of Understanding or contracts.

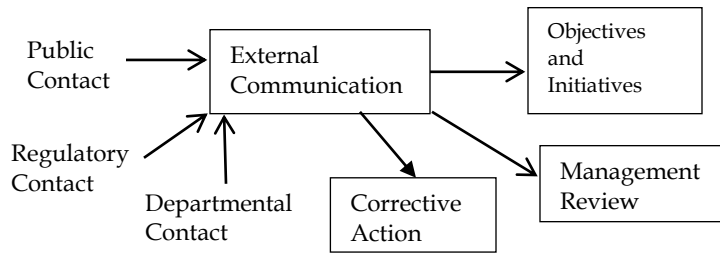
Communication

Purpose

To establish, implement, and maintain procedures to provide, receive and respond to external communication from interested parties, contractors, and internal communication

from staff in the Resource Recovery Division, relevant to the EMS processes and compliance obligations.

Procedure



External Communication

1. Receive and respond to public input using multiple forms of communication.
2. Document contact, input and information received, both formal and informal, using the Citizen Contact Tracking Log.
3. Contractors may also receive input while performing contracted services for the wastewater program.
4. Document response to complaints on the Citizen Contact Tracking Log.
5. Review Citizen Contact Tracking Log and look for trends in performance.

Response and Consideration of Public Input

1. Consider input received from stakeholders and interested parties (if any) when making decisions regarding the EMS setting program objectives and initiatives (EMS Team).
2. The EMS team also discusses and considers input received from stakeholders and interested parties when determining which (if any) of their expectations become compliance obligations.
3. Review records of public input received (if any) for:
 - relevancy to the program
 - incorporation in objectives and initiatives when feasible and/or appropriate
 - incorporation in environmental impacts when feasible and/or appropriate

Communication and Outreach

1. Identify interested parties and stakeholders, which may include public, contractors and regulators. Maintain a list of interested parties and contact information.
2. Provide opportunities for interested parties to communicate their input on environmental impacts, program performance and areas in which the program can improve at annual stakeholder meetings and multiple forms of communication.
3. Communicate information about management policy, applicable compliance obligations, objectives and initiatives, third party audit schedules and results, and other EMS program information to stakeholders and interested parties at annual stakeholder meetings and various media outlets.
4. Provide information on significant environmental aspects per regulatory requirements or upon request.
5. Refer media requests to the Public Information office.

Biosolids Management Program Performance Report

1. Produce a biosolids management program report annually for previous calendar year.
2. Include the following information in the report
 - Summary of monitoring, measurement and other results that demonstrate the performance of the biosolids program relative to objectives, initiatives, and legal and other requirements.

-
- Summary of the progress toward achieving program objectives and initiatives.
 - Summary of contractor performance.
 - Summary of results of internal audits and independent third-party audits (or where to obtain results).
3. Publish biosolids management program report via the City website and/or other various forms of communications.

Internal Communication

1. Report information about wastewater management activities to staff using multiple forms of communication.
2. Provide opportunities for employee input into the EMS via corrective actions, emails, open door discussions, and program specific EMS meetings.
3. Input will be considered in the development of objectives and initiatives and identifying risks and opportunities for continual improvement of the EMS.

Contractor Communication

1. Identify and incorporate the roles, duties and communication responsibilities of wastewater management suppliers and contractors into service agreements and Memorandum of Understanding.
2. Share EMS program information to contractors through the annual stakeholders meeting, contract negotiations or other standing and ad-hoc meetings, email, phone conversations and or during inspections for contract compliance.
3. Contractors and suppliers communicate any relevant or required information to Raleigh Water.

Documented Information

Identify important documented information required to support and demonstrate the performance of the EMS program. This procedure applies to contractor activities within the wastewater management program as stated in their service agreement and Memorandum of Understanding but does not apply to contractors' internal documents, which are controlled and managed according to contractors' internal procedures as appropriate.

Procedure

Documented Information Requiring Control

1. The following documented information is under control by Raleigh Water as part of the wastewater management program:
 - Policies
 - EMS Manual
 - SOPs
 - EOPs
 - Contractor Service Agreements
 - Contractor Memorandum of Understanding

Procedure for Documented Information Control

1. Identify documented information that requires control, the individual responsible for the controlled document, the location of stored documents, and the retention requirement (if applicable) (Appendix H).
2. Printed copies of documents are considered uncontrolled and should be labeled accordingly.
3. Controlled documents are approved, identified, and dated, easily accessible and reviewed to ensure the document is correct, complete, up-to-date, and accessible where needed.

4. Review of controlled documents will generally be made in response to one or more of the following: management of change, corrective actions, regulatory requirements, management review, review of SOPs, or periodic review.
5. SOPs have a required reviewer and approver and are reviewed within a period not to exceed every 3 years or when changes are made.
6. Notify affected persons of approved changes in controlled documents and make updated versions available.
7. Archive or destroy obsolete versions of the documents.
8. The responsible party may delegate document control responsibilities but retains responsibility to ensure the document is effectively controlled.
9. Follow the state records retention schedule for controlled records

Documented Information of External Origin

1. The following documents are needed to operate the wastewater management system but are not reviewed or approved by Raleigh Water:
 - O & M manuals
 - Regulations
 - Permits
 - SDS sheets
2. These documents must be kept current and accessible by the responsible party.

Operational Control

Process control points (PCPs) are identified and updated in the value chain where product quality, compliance obligations, public acceptance and environmental impacts can be controlled. Operational controls are tools utilized to effectively manage outcomes at PCPs to meet compliance obligations and manage significant environmental impacts.

In order to maintain a life cycle perspective, the City addresses environmental requirements in the design and development process for products or services. This is achieved by including statements in Request for Proposals notifying potential contractors of the Environmental Management System and their requirement to conform to the expectations of this system. Additionally, contractors who are awarded work with the Resource Recovery Division are required to sign the Contractor Memorandum of Understanding. This document communicates the Division's responsibilities to the contractor within the limits of the EMS as well as relevant environmental requirements of the contractor.

Procedure

Process Control Points

1. Evaluate unit process operations and management activities to identify and maintain up-to-date listings of PCPs and operational controls of identified PCPs (EMS Team).
2. Consider compliance and public acceptance requirements as well as personal experience of program staff when identifying and/or updating PCPs.
3. Document identified PCPs (Appendix C).
4. Establish SOPs for monitoring and measuring operating performance and compliance with compliance obligations at PCPs.
5. Review PCPs when there are regulatory changes or whenever operational changes occur and use Management of Change process for operational and process changes.
6. Notify the third-party auditor of any constructive or operational change requiring a corresponding change to the identified PCPs or environmental impacts with the PCP, briefly describing the change and its impacts.

Operational Controls

1. Evaluate PCPs to identify operational controls that can affect or influence each outcome.
2. Document identified operational controls (Appendix C).
3. Monitor operational data daily for compliance and record in logbook.
4. Record and track process control system, laboratory information system and operation reporting system analytical information in the Hach WIMS database daily.
5. Update operational controls and monitoring and measurement procedures as necessary.
6. Consider life cycle perspective when developing operational controls.
7. Require contractors to establish their own operational controls consistent with their roles and responsibilities in the wastewater management activities. Sub-contractors must also adhere to the requirements of the contractor.

Emergency Preparedness and Response

Purpose

To ensure effective response to accidents and emergency situations associated with Resource Recovery activities, and to help minimize consequences or associated risks, including activities of the contractors.

Procedure

1. Evaluate and update the Wastewater Emergency Operations Plans and the NRRRF Notification, Evacuation, and Shelter Plan (NESP) at least annually based on desktop exercises, actual incidents, actual exercises, and drills.
2. Reviews and/or updates to the biosolids and reuse EOPs and the NRRRF NESP can also occur due to personnel and equipment changes.
3. Evaluate and provide input in updating the comprehensive Raleigh Water Emergency Operations Plan (EOP) at least every three years.
4. Conduct periodic emergency response testing and training.
5. Conduct investigations of accidents and emergency situations associated with Resource Recovery activities and document corrective action plans for incidents and emergency situations utilizing accident investigation form in Intalex.
6. Monitor Resource Recovery contractors during periodic site visits, by assigned contract liaison, to verify they have on file the most current version of the biosolids EOP and follow the guidelines in the EOP applicable to wastewater management activities as stated in their service agreement and Memorandum of Understanding.

Performance Evaluation and Improvement

Periodic review of the EMS takes place through internal audits, monitoring and measuring, and management reviews to track and evaluate performance of the system and to identify opportunities for improvement.

Monitoring, Measurement, Analysis, and Evaluation

Purpose

To monitor environmental performance with applicable compliance obligation requirements, measure performance at PCPs, and track progress toward achievement of objectives.

Procedure

1. The EMS monitors and measures the following Key Performance Indicators (KPIs) (Appendix K):
 - Compliance Obligations
 - Crop Productivity
 - Maintenance Productivity
 - Energy Consumption Rates
 - Chemical Consumption Rates
 - Process Control Requirements
2. Items related to compliance obligations, objectives and initiatives, environmental performance, and effectiveness of the EMS will be monitored.
3. The methods for monitoring are based on compliance obligations and/or existing performance metrics requested by the Executive Management Team. Information is analyzed, evaluated, documented, and reported via periodic performance reports.
4. Data input by staff and monitored by the program managers occurs on a continual basis and may be discussed in regularly scheduled EMS meetings, Resource Recovery program meetings, and management review meetings.
5. Review monitoring and measurement activities whenever significant changes in processes, operations, or regulatory compliance occur.

Internal Audit

Purpose

To perform periodic review of the EMS to evaluate its performance and identify opportunities for improvement.

Procedure

1. The EMS team will develop a three-year audit schedule for conducting internal and process audits, based upon the EMS processes.
2. Develop scope and plan for internal audits and process audits with input from Management System Coordinator and/or EMR.
3. Evaluate EMS performance in the process of continual improvement of the intended outcomes and progress of established program objectives and initiatives.
4. The auditor will conduct audit, develop report, and review preliminary audit results (findings and/or opportunities) with the process owner and the EMS team.
5. Findings will be addressed using the corrective action process based on the decision of the EMS team.
6. Corrective actions will be presented to the auditor; auditor will follow up to verify corrective action results.
7. The EMR will present audit results as part of the management review process.

Selecting and Training Auditors

1. The EMR, with input from the EMS team, selects auditors to conduct internal audits.
2. Impartiality will be ensured by selecting internal auditors outside the Resource Recovery Division.
3. Internal auditors will be trained by a third party or internally by the EMR.

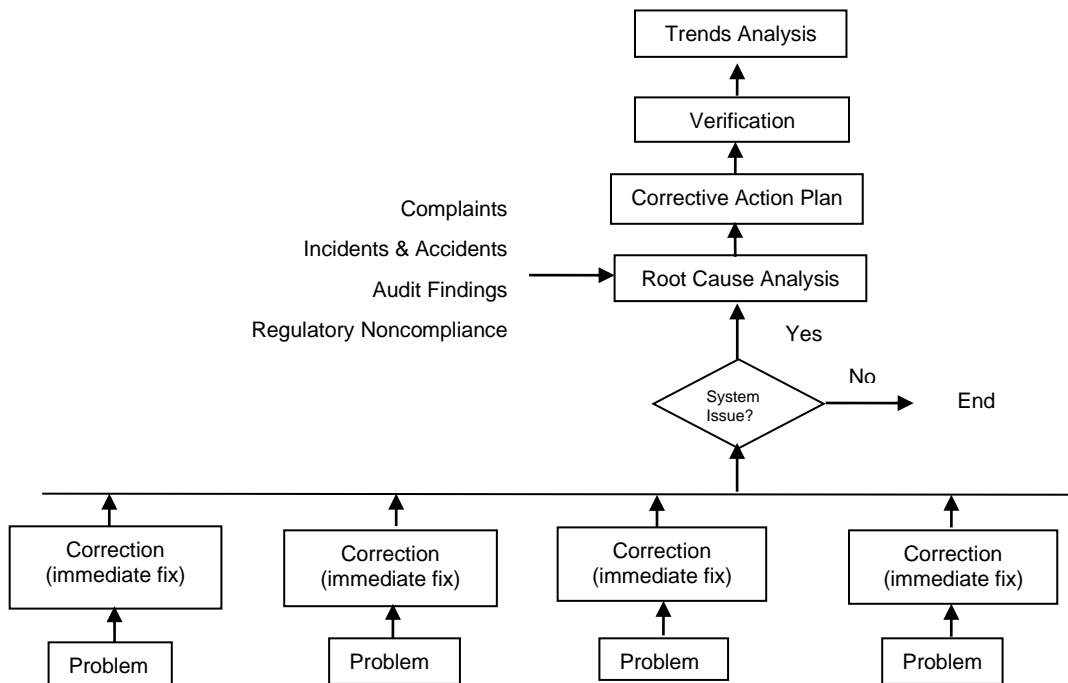
Corrective Action

Purpose

To identify findings, potential problems or opportunities discovered during routine monitoring and measurement, emergency incidents, audits, experience, or other methods.

Procedure

1. Identify the issue and initiate correction; determine if the issue is systemic.
2. For non-systemic issues, correction is all that is required. Document the immediate correction and take no further action.
3. For systemic issues, conduct a root cause analysis.
4. Document problem or issue using the Corrective Action form and present to EMS team and/or affected parties.
5. Develop corrective action plan and implement appropriate corrective actions.
6. Monitor progress in achieving corrective action.
7. Verify effectiveness of corrective action (completed and eliminated cause).
8. Record corrective actions and look for trends.
9. Corrective actions identifying a change in procedure, policy, workflow, and/or equipment needs are communicated through the Management of Change (MOC) process and presented to affected parties.
10. If the problem identified is with a contractor/supplier, the steps above will apply; a SCAR form will be issued to the contractor for resolution.



Management Review

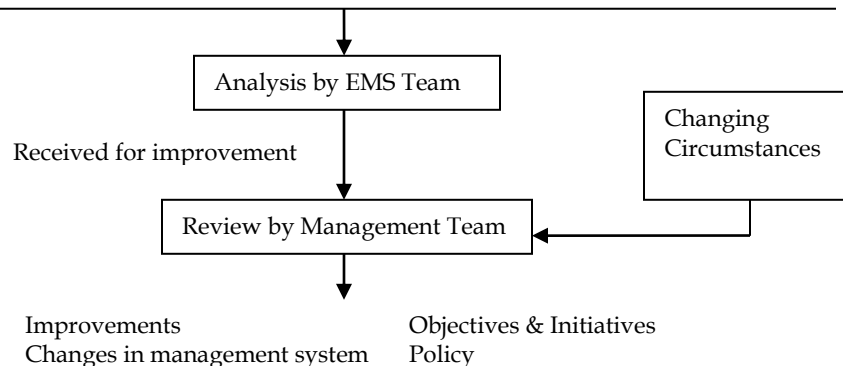
Purpose

To provide a strategic review of the EMS, at scheduled intervals, to see if the system continues to be suitable, adequate and functions effectively and to identify continual improvement opportunities.

Procedure

1. Conduct periodic management reviews with EMS Senior Management team, which includes the Assistant Director for Wastewater and Resource Recovery Manager.
2. Management review will include:
 - Status of actions from previous management reviews
 - Changes in external and internal issues; interested party needs/expectations; significant environmental aspects; risks and opportunities
 - Progress toward achieving objectives and initiatives
 - Environmental performance information (including monitoring/measurement results, nonconformities and corrective actions, fulfillment of compliance obligations, and audit results)
 - Adequacy of resources
 - Relevant communication, including complaints, with interested parties
 - Opportunities for continual improvement
3. Discuss and provide information to the management review participants in advance of management review, along with recommendations for improvement (EMS team).
4. Senior Management Team will review suitability, effectiveness, and adequacy of the management system, including actions required when environmental objectives are not achieved; opportunities to improve EMS integration with other business processes; and implications for a strategic direction.
5. Prepare minutes of the Management Review and post on Raleigh Water shared drive.
6. Assign responsibilities on action items with timelines.

Status of actions from previous reviews	Changes in risks & opportunities
Changes in external & internal issues	Extent to which environmental objectives achieved
Interested party needs/expectations	Environmental performance information
Changes in significant environmental aspects	Adequacy of resources
Opportunities for continual improvement	



Glossary of Terms

Appendices - documents that relate more to the wastewater management system as a whole. The manual is complete without the appendices, but appendices add insight into the wastewater management program.

Biosolids – solid organic matter recovered from a wastewater treatment process and used especially as fertilizer; usually referred to in the plural.

BMP – Best Management Practice

Contractor Memorandum of Understanding – Document that is signed by contractors or suppliers stating their understanding of our EMS program and detailing their responsibilities under that program; this document also details the City's responsibility to contractors under the EMS program

Contractor Service Agreements – Contracts that have been signed by contractors or suppliers; these are housed downtown at the City Clerk's office

SOP – Standard Operating Procedures. Standard work instructions and practices for employees describing the "how to" steps in managing PCPs of a specific management activity affecting NRRRF activities and compliance obligations.

DWR – Division of Water Resources (State of North Carolina)

EMR – Environmental Management Representative

EMS – Environmental Management System: management framework for integrating environmental considerations into day-to-day operations and decision-making, and for improving organizational performance over time.

EMS Senior Management Team – includes Assistant Director for Wastewater, Resource Recovery Manager, Management System Coordinator, and the EMR

EMS Team – includes program managers and supervisors or their designee for the Resource Recovery Division. Also includes the Management System Representative and EMR.

Environmental Aspects – wastewater treatment activities, products or services that can interact with the environment.

Environmental Impacts – any adverse or beneficial change to the environment, wholly or partially, resulting from the NRRRF wastewater activities.

EOP – Emergency Operations Plan

Goals – desired outcomes and/or improvements to the system.

Interested Parties – a person or organization that can affect or be affected by or perceive itself to be affected by any activities we perform.

Internal Audit – a systematic internal investigation process for objectively evaluating the conformance to the requirements of the EMS and identifying deficiencies to be corrected or resolved.

Intranet – the Raleigh Water shared drive.

Life cycle – consecutive and interlinked stages of a product (or service) system, from raw material acquisition or generation from natural resources to final disposal.

NCDEQ – North Carolina Department of Environmental Quality

Noncompliances – a deviation from federal, state and local laws, regulations and other compliance requirements applicable to NRRRF activities.

Nonconformances - a deviation from wastewater management policy, EMS procedures/requirements of the EMS Elements, or ISO 14001:2015 American National Standards. They include circumstances that can create a noncompliance situation or significant environmental impacts.

NRRRF – Neuse River Resource Recovery Facility

O&M Manuals – Operation and Maintenance manuals

Objectives – measureable improvements to established goals

Operational Controls – include associated SOPs, O&M manuals, maintenance procedures, lab analysis, contracts and employee skills that are required to effectively manage PCPs and meet legal requirements, including conformance with policy requirements and achievement of goals and objectives.

Other Requirements – other binding wastewater management practices and requirements to which the NRRRF follows as part of the wastewater management system. Examples include binding agreements with customers, suppliers, public organizations and commitments to going beyond compliance.

PCP – Process Control Point: the process control points where product quality, legal compliance and requirements, public acceptance, and environmental impacts can be controlled

RRD – Resource Recovery Division; consists of Neuse River Resource Recovery Facility, Little Creek Wastewater Treatment Plant, and Smith Creek Resource Recovery Facility and all associated pump stations.

Service Agreements – the contract between the City (NRRRF) and other person(s) to perform specific activities and services.

Significant Aspects – something that can cause a high or medium risk in areas where improvement is desired.

SIU – Significant Industrial User.

SMART Criteria – **S**pecific, **M**easurable, **A**chievable, **R**elevant, **T**ime-bound; criteria that is used to define and evaluate the suitability of a goal or objective/target.

Third party Verification Audit – a systematic, structured audit of the EMS; performed by a qualified independent third-party auditor using a standardized protocol for verification.

USEPA – United States Environmental Protection Agency

USEPA 40 CFR 503 – Federal regulation governing biosolids

Written Documentation – Documents that may be referenced to effectively manage PCPs and meet legal requirements. These documents include O & M manuals, SOPs, and training documents.

Appendices

Appendix A	EMS Program Structure
Appendix B	Letter of EMS Implementation
Appendix C	Process Control Points
Appendix D	Environmental Impact Analysis
Appendix E	Interested Parties
Appendix F	Roles & Responsibilities
Appendix G	Lines of Authority
Appendix H	Documented Information Requiring Control
Appendix J	Risk Assessment
Appendix K	Monitoring and Measurement Analysis