

BMP Element 1— Documentation City of Richmond Public Utilities – Wastewater Treatment				
Date of Last Review 07/23/20	Revision 15	Revised By Biosolids Team	Revision Date 11/07/16	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date: 11/07/16	

Purpose

The purpose of this document is to provide documentation of the City of Richmond’s Biosolids Management Program (BMP) procedures and activities.

Scope

The scope of this element applies to the BMP Manual and all related biosolids activities. The City of Richmond BMP Manual consists of a general overview of our Biosolids program, which include an outline of the policies governing BMP procedures for environmental management. In addition, it serves as a useful organizational index and as a cross-reference of procedures for other relevant documents.

Responsible Staff

The Biosolids Supervisor and the BMP team are responsible for developing and maintaining the BMP manual with input from the BMP team, Deputy Department Director Senior, Plant Operations Superintendent & Plant Operations Supervisor Senior, Environmental Compliance Officer, Operations Supervisors, Chief Chemist, Administrative Program Support Assistant, and interested parties.

General

The City of Richmond, Wastewater Treatment Plant, utilizes an activated sludge process to treat wastewater from domestic, commercial, and industrial customers in the City’s service area. The City provides for the management and beneficial reuse of an-aerobically digested biosolids through land application. This includes but is not limited to processing, loading, transporting, land applying and testing of biosolids. The City of Richmond, through the biosolids contractors, coordinates with state, local and federal agencies as well as the general public to provide education and outreach on the benefits of land application.

Liquid Flow Stream

Wastewater enters the plant’s main pumping station from the City’s collection system. A bar rack devices screened wastewater, and then it is pumped to the primary sedimentation tanks for solids and grit removal. Wastewater then flows by gravity through four parallel primary clarifiers, to the aeration basins, and to the secondary clarifiers. It then flows through filtration system where de-nitrification occurs and to the disinfection process using UV. The effluent is finally discharged into James River.

Biosolids Value Chain and Solids Handling

Biosolids value chain is a production process that includes biosolids thickening, digestion, and dewatering, transport, and land application.

Biosolids at the Richmond Wastewater Treatment Plant are generated from the anaerobic digestion of primary and secondary sludge. Primary sludge is pumped to gravity thickening tanks to allow more time for the sludge to thicken before being pumped to the digesters and the fermenter. The fermenter consists of a tank with low solids retention time that produces fatty acids as readily carbon source for denitrification. The Waste-activated solids (WAS) are pumped from the secondary clarifiers to the centrifuges for thickening. WAS is mixed with the primary gravity thickened sludge and then pumped to the digesters. Biosolids that are displaced from the digesters flow to one of two storage tanks. The biosolids are then dewatered using centrifuges and polymer to aid in the dewatering process. This process generates class B biosolids that meet the Code of Federal Regulations 40 CFR part 503. The hauling/land application contractor hauls dewatered biosolids from the discharge points of the reversing conveyor belt of the truck drive through area of the dewatering building for temporary storage on the biosolids storage pad. The de-watered biosolids are stored on a concrete pad under [DEQ regulation](#) until the hauling/land application contractor can remove them for land application. The hauling/land application contractor delivers and applies biosolids to farms and other locations for use as a fertilizer. Biosolids that do not meet quality standards are disposed of at a landfill. Quantities of dewatered biosolids range from 18 to 100 wet tons per day. The pH ranges from 6.5 to 8.0. Biosolids fraction varies between 25 and 28 %.

Organization of This Manual

The City of Richmond BMP manual consists of 17 elements covering five general categories. Each element represents part of the City’s biosolids value chain.

Table 1.1 describes the categories and the 17 elements.

Table 1.1 BMP Organization By Categories		
Category	Element #	Element
Policy	1	Documentation
	2	Biosolids Management Policy
Planning	3	Critical Control Points
	4	Legal and Other Requirements
	5	Goals and Objectives for Continual Improvement
	6	Public Participation in Planning
Implementation	7	Roles and Responsibilities
	8	Training
	9	Communication
	10	Operational Control of Critical Control Points
	11	Emergency Preparedness and Response
	12	BMP Documentation, Document Control, and Record Keeping
Measurement and Corrective Action	13	Monitoring and Measurement
	14	Nonconformance: Preventive and Corrective Action
	15	Performance Report
	16	Internal BMP Audit
Management Review	17	Periodic Management Review of Performance

Procedures

1. The BMP manual is a “living” document. Revisions are made as new information is obtained, changes to existing systems occur and as experience is gained in administering a BMP.
2. The Biosolids Supervisor works with the BMP Team to revise the electronic BMP manual. Once revisions have been made, the Biosolids Supervisor informs management of the availability of the revised BMP manual. In addition, the most recent version of the BMP manual is posted on the City P drive (P:\BMP-Biosolids).
3. The Biosolids Supervisor provides notification of revisions to interested parties through one or more of the communication tools listed under Element 9.
4. More information on revisions to the BMP manual and document control is available in Element 12.

BMP Element 2 — Biosolids Management Policy City of Richmond Public Utilities – Wastewater Treatment				
Date of Last Review 10/28/19	Revision 14	Revised By Biosolids Team	Revision Date 10/28/15	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 10/28/15	

Purpose

This element establishes the City’s Biosolids Management policy and procedures for revision. The purpose of the policy is to establish the guiding principles of the City of Richmond’s Biosolids Management Program (BMP).

Scope

This policy applies to the City’s biosolids management activities and acts as a benchmark for current and future biosolids management.

Responsible Staff

The Biosolids Supervisor and the BMP team are responsible for establishing a Biosolids Management Policy with input from the Deputy Department Director Senior, Plant Operations Superintendent & Plant Operations Supervisor Senior, and the Environmental Compliance Officer.

Procedures

1. The Biosolids Management Policy commits the City to follow the principles of conduct set forth in the *Code of Good Practice*.
2. The Biosolids Supervisor communicates the Biosolids Management Policy at safety meetings to all staff involved in the biosolids value chain, as described in Element 8, and to the hauling/land application contractor and other contractors.
3. The hauling/land application contractor and other contractors are responsible for communicating the City’s policy to their staff and subcontractors.
4. The Biosolids Supervisor makes the Biosolids Management Policy available to interested parties for their input. Input from interested parties will be evaluated in accordance with Element 6.

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5. If revisions to the Biosolids Management Policy are needed because of changing conditions, the Biosolids Supervisor will notify the Plant Operations Superintendent & Plant Operations Supervisor Senior and the Deputy Department Director Senior of the issues.

The City of Richmond, Virginia’s environmental policy statement commits the City to protecting the environment while providing first-class municipal activities, products, and services to its citizens, businesses, and visitors as stated below,

Biosolids Management Program Policy Statement

Consistent with the City’s Environmental Policy Statement, the City of Richmond’s Wastewater Treatment Plant (WWTP) is committed to the following principles of conduct set forth in the National Biosolids *Code of Good Practice*. The WWTP will make available resources to produce Class B Biosolids. Further, it shall be the position of the WWTP to promote the beneficial use of Biosolids and the reuse/recycling of resources. The WWTP will strive to maintain, improve, and protect the environment through its treatment/production of biosolids. The WWTP will make every effort to ensure that the public is not endangered or inconvenienced by the treatment/production of biosolids at the WWTP or application sites. The WWTP shall obey all applicable federal, state, county, and local laws, rules, and regulations. We pledge to “do the right thing” and uphold the following principles of conduct.

Code of Good Practice

The Code of Good Practice (the Code) is a broad framework of goals and commitments to guide the production, management, transportation, storage, and use or disposal of biosolids. Those who embrace the Code and participate in the National Biosolids Partnership (NBP) commit to “do the right thing.” Specifically, code subscribers and NBP participants pledge to uphold the following principles of conduct:

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.

PRODUCT: To provide biosolids that meet the applicable standards for their intended use or disposal.

NBP BIOSOLIDS MANAGEMENT PROGRAM: To develop a Biosolids Management Program that includes a method of independent third-party verification to ensure effective ongoing biosolids management.

QUALITY MONITORING: To enhance the monitoring of biosolids production and management practices.

QUALITY PRACTICES: To require good housekeeping practices for biosolids production, processing, transport, storage, and during final biosolids use or disposal operations.

CONTINGENCY AND EMERGENCY RESPONSE PLANS: To develop response plans for unanticipated events such as inclement weather, spills, and equipment malfunctions.

SUSTAINABLE MANAGEMENT PRACTICES AND OPERATIONS: To enhance the environment by committing to sustainable, environmentally acceptable biosolids management practices and operations through a Biosolids Management Program.

PREVENTIVE MAINTENANCE: To prepare and implement a plan for preventive maintenance for equipment used to manage biosolids and wastewater solids.

CONTINUAL IMPROVEMENT: To seek continual improvement in all aspects of biosolids management.

COMMUNICATION: To provide methods of effective communication with gatekeepers, stakeholders, and interested citizens regarding the key elements of each Biosolids Management Program, including information relative to program performance.

BMP Element 3 — Critical Control Points City of Richmond Public Utilities – Wastewater Treatment				
Date of Last Review 07/23/20	Revision 15	Revised By Biosolids Team	Revision Date 11/08/16	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 11/08/16	

Purpose

Critical control points must be properly managed to ensure biosolids meet applicable regulatory requirements and continue to maintain public acceptance, ensuring maximum beneficial use.

Scope

This element pertains to all management categories in the biosolids value chain and activities that impact the biosolids.

Responsible Staff

The Biosolids Supervisor, with support from the BMP Team, Plant Operations Superintendent & Plant Operations Supervisor Senior, and the Deputy Department Director Senior, is responsible for oversight of critical control points in the biosolids value chain. The hauling/land application contractor is responsible for truck loading, land application, site inspections, monitoring, communications, and permitting protocol procedures related to its activities. Utility Plant Operators are responsible for carrying out operational controls.

Procedures

1. Review and revision of the critical control points in the biosolids value chain are triggered by:
 - A. Changes in operational controls;
 - B. Changes in goals and objectives;
 - C. Changes in legal or other requirements;
 - D. Reconfiguration of equipment or installation of new equipment in the biosolids value chain; or
 - E. Nonconformance or findings from internal or third-party audits.

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2. Regardless of the conditions listed in procedure #1, a review of all critical control points is performed annually in conjunction with the annual review of goals and objectives. This review shall be performed no later than November.
3. Changes to the critical control points are documented by the Biosolids Supervisor. If any significant operational changes occur that require a change to an identified critical control point or environmental impact associated with the critical control points, the Biosolids Supervisor will notify the assigned third-party auditor consistently with current NBP recognition and certification.
4. The current list of critical control points is summarized in [Table 3.1](#). Critical control points have associated operational controls listed in the table. The appropriate work groups have standard operating procedures prescribing practices, monitoring, measurement, testing, and/or inspection methods used to ensure biosolids and biosolids activities meet or exceed all legal, quality, environmental protection, and public acceptance requirements.
5. Operational controls provide methods and procedures to ensure uniform and efficient management at each critical control point. To show the relationship between operational controls and critical control points and to streamline documentation of information, Element 10 information is integrated with critical control points in Element 3 [Table 3.1](#)
6. Potential environmental impacts for each critical control point are listed in [Table 3.1](#).

BMP Element 4 — Legal and Other Requirements City of Richmond Public Utilities – Wastewater Treatment				
Date of Last Review 07/23/20	Revision 17	Revised By Biosolids Team	Revision Date 11/01/18	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 11/01/18	

Purpose

The purpose of this element is to summarize the process used by the City of Richmond, Department of Public Utilities to identify and track legal and other requirements applicable to the biosolids program.

Scope

This procedure applies to biosolids management activities at all critical control points throughout the biosolids value chain.

Responsible Staff

The Biosolids Supervisor and Plant Operations Superintendent & Plant Operations Supervisor Senior are responsible for tracking all federal, state, and local legal and regulatory requirements pertaining to the Richmond Wastewater Treatment Plant biosolids. The Deputy Department Director Senior, Environmental Compliance Officer, Public Relations Manager, Chief Chemist, support these activities. The hauling/land application contractor is responsible for tracking the same requirements related to its activities.

Procedure

1. Sources of information about regulations and potential effects on the City’s biosolids program are as follows:
 - A. Updates from the National Biosolids Partnership (NBP), including periodic biosolids update e-mails, are available at <http://www.wef.org/biosolids>;
 - B. Information from the Virginia Department of Health is available at <http://www.vdh.virginia.gov/> ;

- C. Information from the Virginia Biosolids Council is available at <http://www.virginiabiosolids.com>
 - D. Federal Environmental Protection Agency regulations are available and updated through the Federal Register website at <http://www2.epa.gov/laws-regulations/regulations> ;
 - E. The State of Virginia Department of Environmental Quality updates regulations on the following website: <http://www.deq.virginia.gov/>;
 - F. Federal pretreatment regulations 40CFR part 403 and amendments are available on the website: <https://www.epa.gov> ;
 - G. VPDES Permit for Wastewater Treatment Plant requirements are available on the following website:
<http://www.deq.virginia.gov/Programs/Water/PermittingCompliance/PollutionDischargeElimination/PermitsFees.aspx> ;
 - H. Federal regulations on use and disposal of biosolids are detailed on the webpage: http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr503_main_02.tpl;
 - I. Land application operations permit available under [Virginia Pollution Abatement Permit Regulation chapter 32](#);
 - J. Land application monitoring and measurements requirements, storage, application rates, and setbacks detailed in the following website: [federal regulation](#) and [State regulation](#).
2. Sources maintained by the hauling/land application contractor These information sources will be used to update and/or revise the City of Richmond’s biosolids procedures using the procedure outlined below. A list of legal requirements is found in Table 4.1 below.
3. Legal and other requirements are tracked by such mechanisms as attendance at professional meetings and conferences, advice from the Virginia Biosolids Council (VBC) or its principals, periodic review of regulatory and NBP websites, notices from regulators, input from Richmond Headquarters or other governmental affairs staff, review of professional journals and reports, VBC input, and Environmental Compliance Officer.
4. Changes in legal requirements affecting the biosolids value chain are communicated to staff and affect the operations of the biosolids value chain in the manner described below.
- A. The Plant Operations Superintendent tracks all federal, state and local legal and regulatory requirements applying to the Richmond Wastewater Treatment Plant biosolids;
 - B. In the case of new permitted industries, the Environmental Compliance officer informs the Biosolids Supervisor of any new industrial/commercial sewer users that could impact operation of the wastewater treatment plant;

- C. Information gathered by the Environmental Compliance staff is evaluated for applicability to the biosolids value chain. Applicable regulatory information and updates are communicated to the Biosolids Supervisor through e-mail, meetings, or other means of communication;
- D. Regulatory information that is general or preliminary in nature is passed on to the BMP Team. The BMP Team will monitor the progress of pertinent legislation to determine when action is needed;
- E. Changes in legal or regulatory requirements that affect contractors' activities are passed on to contractor or from the contractor to the Biosolids Supervisor;
- F. If the regulatory or other updates require action, the Plant Operations Superintendent will assign tasks related to the regulatory or process changes, ensuring they are accomplished in a timely manner;
- G. Changes in legal and other requirements may trigger changes in operational controls, SOPs monitoring and measurement, or other practices described in the BMP Manual. The biosolids supervisor will discuss the change with the operations supervisor to ensure associated changes are made to the appropriate BMP Manual element(s) and will bring revisions to the next regularly scheduled BMP team meeting;
- H. Laboratory regulation establishing test procedures for analysis of pollutants are detailed in following website:

http://www.epa.gov/region9/qa/pdfs/40cfr136_03.pdf

Table 4.1 List of Relevant Legal and Other Requirements				
NOTE: Follow the links below for detailed requirements.				
Regulation or Other Requirement	Required Report or Record	Due Date	Report or Record Location	Method used to comply with Regulatory requirement
Federal				
<p>Federal regulations on use and disposal of biosolids – 40 CFR Part 503 and amendments</p> <p>1For Pathogen reduction [40CFR 503.32(b)(3)] Appendix B- A3</p> <p>2Vector reduction [40 CFR 503.33(b)(1)(10)(i)]</p>	Annual Report	February 19	Filed in Plant Operations Superintendent’s office	Alternative 2 for Processes to Significantly Reduce Pathogens (PSRP) Anaerobic digestion (see SOP). Mean cell residence time and temperature shall be between 15 days at 35°C to 55°C and 60 days at 20°C
<p>Federal pretreatment regulations – 40 CFR Part 403 and amendments, see also attached Pretreatment permit, page 18 of 41</p>	Annual Report	January 31	Environmental Compliance Officer’s Office	
<p>Laboratory regulation: 40CFR Part 136: Establishes test procedures for analysis of pollutants</p>	Monthly	By the 10th	Operator10™ application, Plant Operations Superintendent’s office.	
State				
<p>VPDES Permit for the Richmond Wastewater Treatment Plant</p> <p>Virginia Biosolids Regulation chapter 31</p> <p>[9 VAC 25.31.710 D3], Pathogen requirement</p> <p>[9 VAC 25.31.720 B-1], Vector reduction attraction and temperature</p> <p>[9 VAC 25.31.550], Management practices</p> <p>[9 VAC 25.31.710 B-6] for site restrictions.</p>	<p>Discharge Monitoring Report</p> <p>Biosolids Annual Report</p>	<p>10th of each month</p> <p>February annually</p>	<p>Operator 10™ on server</p> <p>Operator 10™ on server</p>	<p>Alternative 2 for processes to significantly reduce pathogens Anaerobic digestion (see SOP). Mean cell residence time and temperature shall be between 15 days at 35°C to 55°C</p>

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BMP Element 4 — Legal and Other Requirements

<p>Hauling, land application, and storage facility requirements: Responsibility of the hauling/land application contractor (Nutriblend), see Contract, VPDES Permit part II page 9 of 41 and Biosolids Management Plan known as Nutriblend's O&M manual. [9VAC25-32-550] for Storage Facilities</p>	<p>As Required under contract</p>	<p>As Required</p>	<p>In Contractor's Office and City P-drive</p>	<p>Nutriblend' O&M describes the land application activities available on P-drive and in the Biosolids supervisor office</p>
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BMP Element 5 — Goals and Objectives for Continual Improvement City of Richmond Public Utilities – Wastewater Treatment				
Date of Last Review 10/28/19	Revision 16	Revised By Biosolids Team	Revision Date 07/27/17	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 07/27/17	

Purpose

The purpose of this element is to drive the continual improvement of the biosolids program by establishing long-term biosolids program goals and associated short-term objectives for biosolids management activities. This element also establishes an action plan to implement goals and objectives based upon SMART (Specific, Measurable, Achievable, Relevant, and Time-bounded) criteria.

Scope

This element applies to all critical control points in the biosolids value chain and all BMP elements.

Responsible Staff

The BMP Team is responsible for setting biosolids goals and objectives. The Deputy Department Director Senior, Plant Operations Superintendent & Plant Operations Supervisor Senior, Biosolids Supervisor, and other staff in the biosolids value chain are solicited and encouraged to give their input to the goals and objectives setting and review process. The hauling/land application contractor is responsible for goals and objectives for its activities.

Procedure

1. The BMP Team determines goals and objectives based on the City’s Biosolids Management Policy, adherence to SMART criteria, and input as listed in this procedure. Goals and objectives are developed to address each of the four NBP outcome areas: environmental performance, regulatory compliance, relations with interested parties, and quality biosolids management practices.
2. The Biosolids Supervisor tracks progress toward current goals and objectives using the [Goals Action Plan](#) form. The goals action plan lists interim steps for each objective, resources required, expected completion dates, and progress toward each milestone and objective. See goals and objectives [table 5.1](#)

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3. Goals and objectives are reviewed when required during regular BMP team meetings. On an annual basis to occur by November of each year, goals and objectives are revised, or documentation is made so that existing goals and objectives remain applicable for advancement of the BMP.
4. More frequent revisions of goals and objectives may be triggered by one or more of the following considerations:
 - A. Changes to the City's biosolids management policy,
 - B. Input (if any) received from interested parties, the public, regulators, or staff involved in the biosolids value chain,
 - C. Response to regulatory changes, regulatory noncompliance, or BMP nonconformance,
 - D. Changes in direction from management.
5. The goals and objectives revision process includes the following steps:
 - A. The BMP Team evaluates the need for goals revision based on considerations as specified in #2 and #3 above;
 - B. The BMP Team drafts revisions to the goals and objectives;
 - C. The BMP Team seeks input from biosolids-value-chain staff, interested parties, requesting input at staff meetings, and other outreach methods as described in Elements 6 and 9;
 - D. The BMP Team seeks input on goals from the hauling/land application contractor and incorporates relevant goals from the contractor into the City's goals;
 - E. All input is evaluated by the BMP Team;
 - F. Draft goals and objections are reviewed and approved by the Biosolids Supervisor;
 - G. A final revision is made by the BMP team and incorporated into the City's BMP manual;
 - H. When goals no longer represent further improvement, such as when a standard threshold has been met or maintained and has become standard practice, goals may be removed from the list of goals and archived on P drive under [goals win](#);
 - I. Goals not achieved will be removed from the list of goals and objectives and will be archived on P-drive under [goals not achieved](#).

6. Goals are established using the following criteria:
 - A. Consistent with the NBP *Code of Good Practice*,
 - B. Consistent with the policy,
 - C. Response to input from biosolids-value-chain staff, contractors, and the public, including interested parties,
 - D. Linked with critical control points,
 - E. Available funding,
 - F. Personnel resources to carry out the goals and objectives,
 - G. Regulatory changes.

BMP Element 6 — Public Participation in Planning City of Richmond Public Utilities – Wastewater Treatment				
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Purpose

The purpose of this procedure is to establish public involvement in the planning process, including input regarding biosolids program performance improvements and third-party verification process. This procedure includes activities designed to enhance the public image of the City’s biosolids treatment and application programs.

Scope

The City has a well-managed biosolids program that has been in operation for many years. During this time, there have been few, if any, concerns about the City’s biosolids program expressed by the public.

Public confidence continues to remain good and public interest in participating in the City’s planning process is relatively low. The City’s proactive approach to providing the public with meaningful opportunities to provide input in the planning processes is consistent with legal requirements, the degree of current public interest, historical levels of public involvement and related local circumstances.

Staff

The Biosolids Supervisor and Plant Operations Superintendent & Plant Operations Supervisor Senior, have primary responsibility for this element. The Public Information Manager is responsible for all public information. The hauling/land application contractor is responsible for obtaining public input on its activities.

Procedure

1. Interested parties are identified by meeting one of the following criteria:
 - A. Owners of land permitted for biosolids application;
 - B. Owners and/or residents of property adjacent to land approved for biosolids application;
 - C. Representatives of local, state, and federal agencies including the Virginia Department of Environmental Quality, Virginia Department of Conservation and Natural Resources, Virginia Department of Health, and others;
 - D. Community groups including the Chesapeake Bay Foundation and Virginia Tech Extension educators; and
 - E. Any other individual or organization that shows an interest in the City's biosolids program by contacting staff, attending a public meeting, or requesting information.
2. Interested parties will be removed from the list at their own request verbally or in writing.
3. The list of interested parties is maintained on the City's server. The Biosolids Supervisor is responsible for updating and maintaining this list.
4. The City seeks public participation from interested parties through formal and informal methods. This includes, but is not limited to, invitation for comments on the City of Richmond's website, activities conducted by the Virginia Biosolids Council, and activities conducted by the hauling/land application contractor, including application permit hearings and participation in state and local events. Biosolids information is available on the City's website.
5. The City documents public input in an electronic communications log maintained on the City's website and on the City local server (G:drive) by the Public Information Manager.
6. Response to public input varies with the nature of the comment. City staff acknowledges receipt of the input within two business days, and works to produce a full response within one week. General questions or concerns may be addressed by any BMP Team member in coordination with the Public Information Manager. More technical questions are dealt with by the Biosolids Supervisor in coordination with the Public Information Manager. The hauling/land application contractor is responsible for responding to input it receives.

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7. All public input is discussed at BMP Team meetings and any necessary action items are assigned. Input is noted with respect to its potential impact on biosolids goals, procedures, or the BMP manual. A summary of significant interested-party input is included with the annual biosolids report.
8. The City receives public input through its biosolids hauling/land application contractor via phone calls, e-mail, or monthly reports depending on the nature and urgency of the comment, complaint, or input. The hauling/land application contractor solicits public input through its communication strategy and membership with the Virginia Biosolids Council (VBC).

BMP Element 7 — Roles and Responsibilities City of Richmond Public Utilities – Wastewater Treatment				
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Purpose

The purpose of this element is to define the organizational roles and responsibilities for biosolids management activities throughout the biosolids value chain.

Roles and Responsibilities accomplish three main functions:

1. Biosolids value chain and BMP employees know their roles.
2. The roles of key biosolids value chain and BMP personnel are identified.
3. Responsibilities are assigned to biosolids value chain personnel with the authority and resources to carry out the assigned duties.

Scope

This element assigns roles and responsibilities to all biosolids management operational controls, pertaining to elements, goals and objectives.

Responsible Staff

The Biosolids Supervisor, BMP Team, and Deputy Department Director Senior are responsible for reviewing assigned roles and responsibilities. The Biosolids Supervisor, Plant Operations Superintendent, Plant operations supervisor senior, and the Environmental Compliance Officer assign roles and responsibilities throughout the biosolids value chain. The Public Information Manager has responsibility for roles and responsibilities related to his/her department. Contractors are responsible for assigning roles and responsibilities to their staffs and subcontractors, consistent with their services agreement.

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Procedure

1. Each Element in the BMP Manual lists responsible staff for that element. Table 7.1 summarizes the Roles and Responsibilities for each BMP Element.

Table 7.1 –BMP Responsibilities		
Element	Element Description	Key Roles & Responsibilities
1	Documentation of Biosolids Management Program (BMP)	BMP Supervisor, BMP Team, Deputy Department Director Senior, Plant Operations Superintendent, Plant Operations Supervisor Senior, Senior Management Analyst, Plant Operations Supervisors, Laboratory Manager, and interested parties.
2	Biosolids Management Policy	Biosolids Supervisor, BMP Team, Deputy Department Director Senior, Plant Operations Superintendent, Plant Operations Supervisor Senior, Environmental Compliance Officer
3	Critical Control Points	Biosolids Supervisor, BMP Team, Plant Operations Superintendent, Plant Operations Supervisor Senior, Deputy Department Director Senior, Plant Operators, Plant operations supervisors, Laboratory Manager , Environmental Compliance Officer.
4	Legal and Other Requirements	Biosolids Supervisor, Plant Operations Superintendent, Plant Operations Supervisor Senior, Deputy Department Director Senior, Public Relations Manager, Environmental Compliance Officer, Laboratory Manager, Hauling/land application contractor.
5	Goals and Objectives for Continual Improvement	BMP Team, Deputy Department Director Senior, Plant Operations Superintendent, Plant Operations Supervisor Senior , Biosolids Supervisor, Hauling/land application contractor
6	Public Participation in Planning	BMP Team, Biosolids Supervisor, Plant Operations Superintendent, Plant Operations Supervisor Senior, Public Relations Manager, Hauling/land application contractor
7	Roles and Responsibilities	Biosolids Supervisor, BMP Team, Deputy Department Director Senior, Plant Superintendent, Plant Operations Supervisor Senior, Public Relations Manager, Hauling/land application contractor
8	Training	Biosolids Supervisor, Plant Operations Superintendent, Plant Operations Supervisor Senior, Senior Management Analyst, Occupational Safety and Health Specialist, Hauling/land application contractor
9	Communication	Deputy Department Director Senior, Biosolids Supervisor, Plant Operations Superintendent, Plant Operations Supervisor Senior, Public Information Manager, Department of Information and Technology Manager, Environmental Compliance Officer, Hauling/land application contractor

10	Operational Control of Critical Control Points	Biosolids Supervisor, Plant Operations Superintendent, Plant Operations Supervisor Senior, Deputy Department Director Senior, Environmental Compliance Officer, Hauling/land application contractor.
11	Emergency Preparedness and Response	Occupational Safety and Health Specialist, Plant Operations Superintendent, Biosolids Supervisor, BMP Team,
12	Documentation, Document Control and Record Keeping	Biosolids Supervisor, Utility Plant Superintendents I & II, Chief Operator, Utility Plant Operators, Hauling/land application contractor.
13	Monitoring and Measurement	Plant Operations Superintendent, Plant Operations Supervisor Senior, Biosolids Supervisor, Laboratory Manager, Plant Operation Supervisor, Plant Operators, Hauling/land application contractor
14	Nonconformance: Preventive and Corrective Action	Biosolids Supervisor, Officer, Plant Operations Superintendent, Plant Operations Supervisor Senior, Plant Operators
15	Performance Report	Biosolids Supervisor, BMP Team, Plant Operations Superintendent, Plant Operations Supervisor Senior, Deputy Department Director Senior.
16	Internal BMP Audit	Biosolids Supervisor, Internal auditor team, Plant Operations Superintendent, Plant Operations Supervisor Senior.
17	Periodic Management Review of Performance	Biosolids Supervisor, BMP Team, Deputy Department Director Senior, Plant Operations Superintendent, Plant Operations Supervisor Senior.

2. The Biosolids Supervisor shall review annually with the Plant Operations Superintendent and Plant Operations Supervisor Senior the individuals assigned to roles relevant to the BMP and will update Table 7.1.
3. Specific Roles and Responsibilities are also listed in the following tables:
 - A. Table 3.1 – Critical Control Points (CCPs)
 - B. Table 5.1 –BMP Goals and Objectives
4. Organizational charts for the Water and Wastewater and biosolids value chain are available on P-drive and in the Administration Office at the wastewater treatment plant (WWTP).

Key BMP Roles and Responsibilities

Deputy Department Director Senior

The Deputy Department Director Senior allocates staff time and monetary resources within the Operations Division. She sets the policy, participates in the BMP Management Review, and is encouraged to provide input to the goals and objectives.

Plant Operations Superintendent and Plant Operations Supervisor Senior

The Richmond Wastewater Treatment Plant has Plant Operations Superintendent & Plant Operations Supervisor Senior, together they are responsible for the management of the Wastewater Treatment Plant, and virtually all personnel who work in the biosolids value chain. The Plant Operations Superintendent & Plant Operations Supervisor Senior report to the Deputy Department Director Senior. They also have the authority to allocate staff time and monetary resources within the Operations Division. They are specifically responsible for selecting the BMP Team. The Plant Operations Superintendent & Plant Operations Supervisor Senior have roles related to BMP elements and participate in the BMP Management Review as described in Element 17.

Biosolids Supervisor

This individual is assigned by the Utility Plant Superintendent II. The Biosolids Supervisor has general responsibility to ensure the policies and procedures related to the BMP are implemented. The specific tasks assigned to the Biosolids Supervisor include:

- Facilitating the BMP Team meetings;
- Providing BMP training or assign training responsibilities to qualified staff;
- Maintaining control of all BMP-related documents;
- Ensuring internal and third-party audits are conducted as required by the NBP;
- Reviewing all nonconformance and corrective action forms to ensure the appropriate work group takes action and documents corrective actions;
- Compiling information for the annual biosolids performance report and the annual management review;

- Assisting with the development of the Biosolids Public Participation and Outreach Plan;
- Maintaining the list of interested parties;
- Responding to general questions and comments about the biosolids program in coordination with the Public Information Manager; and
- Assisting in developing outreach materials such as pamphlets.

While the Biosolids Supervisor may delegate any of these tasks to other staff, this person is responsible for ensuring the tasks are completed in accordance with the BMP Manual and any other policies or procedures.

BMP Team

The BMP Team is appointed by the Plant Superintendent & Plant Operations Supervisor Senior. Team members are selected from various work groups associated with the biosolids value chain. The BMP Team works under the direction of the Biosolids Supervisor. The Biosolids Supervisor may assign certain tasks to team members. As a group, the BMP Team reviews and evaluates progress toward goals and objectives. The BMP Team also reviews interested party input relative to the BMP, roles and responsibilities, emergency preparedness, and the management review.

BMP Internal Audit Team

The Internal Audit Team is appointed by the Plant Operation Superintendent. The Audit Team is responsible for ensuring the BMP Manual, for the day-to-day operation of the WWTP facility, and land application practices associated with the biosolids program agree with the requirements of the NBP BMP. The Audit Team provides a summary of findings and conclusions to the BMP Team.

Environmental Compliance Officer

The Environmental Compliance Officer is responsible for the Industrial Pretreatment Program. Specific responsibilities of the Environmental Compliance Officer include, but are not limited to:

- Preparing the Annual Pretreatment Report for the Department of Environmental Quality (DEQ);
- Permitting, sampling, and inspection of Categorical Industrial Users and Significant Industrial Users, and monitoring and inspection of Non-discharging Categorical Industrial Users;

- Describing Biosolids CCPs and OCs associated with the pretreatment program;
- Tracking and reporting on changes to regulatory and other legal requirements that may affect the BMP;
- Ensuring adequate monitoring and measurement practices are in place to evaluate performance of the pretreatment program relevant to the biosolids;
- Contributing to the Biosolids Management Program Performance Report; and
- Communicating with the Biosolids Supervisor and the WWTP staff any changes that may affect the treatment system and/or the biosolids system.

Plant Operations Supervisor and Staff

The Plant Operations Supervisor called also Chief Operator is responsible for the day-to-day operation of the WWTP. The Plant Operations Supervisor evaluates WWTP staffing needs to ensure adequate staff is available to operate the facility, plans, directs, and monitors the long-range work plans and activities performed in the wastewater plant. Specific responsibilities include, but are not limited to:

- Ensuring compliance with state and federal permit requirements, rules, and regulations with respect to the WWTP;
- Managing Biosolids CCPs and OCs associated with the WWTP in absence of the Biosolids Supervisor;
- Ensuring adequate monitoring and measurement practices are in place to evaluate performance of the WWTP and Biosolids in absence of the Biosolids Supervisor; and
- Contributing to the Biosolids Management Program Performance Report.

Plant Maintenance Program Manager and Staff

- The Plant Maintenance Program Manager is responsible for daily maintenance of the WWTP and associated facilities. Maintenance staff performs routine, preventive, and emergency maintenance on a variety of equipment in the biosolids value chain. The Plant Maintenance Program Manager's staff coordinates with the WWTP staff directly or via the Mainsaver™ system to identify equipment for repair to maintain peak operational control of the WWTP process.

Water and Wastewater Quality Chief Chemist

- The Water and Wastewater Quality Control Supervisor ensures that the laboratory procedures related to the biosolids are being performed according to regulations and standards.

Laboratory Manager

- The laboratory Manager ensures that all laboratory tests related to biosolids are being performed accurately and on time.

Senior Management Analyst:

The Senior Management Analyst has the following responsibilities:

- Maintains and grows the Preventive Maintenance Program for Critical Equipment at the Wastewater Plant;
- Monitors all Asset and Part data that is entered into Mainsaver;
- Works with the Contract Management Firm to help ensure a timely delivery of Asset & Part information as well as timely delivery of the actual parts to the Warehouse;
- Assists all Mainsaver users with system use properly and helps to resolve any issues or questions in that concern; and
- Is a member of the Plant Wide BMP Core Team and assists the BMP Team Leader as needed.

Department of Information and Technology Manager

The Information and Technology Manager manages the program and staff related to his department with regard to maintaining the City website and City local servers.

Public Information Manager

- Oversees all aspects of media relations regarding various City departments.
- Manages assigned staff indirectly related to media relations, prepares and distributes information documents, develops and implements internal and external communications programs, coordinates publicity events

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Occupational Safety and Health Specialist

- Develops, implements, reviews, monitors and evaluates departmental safety regulations to ensure adherence to Occupational Safety and Health Administration's (OSHA) regulations;
- Performs audits and inspections of assigned work areas/zones and/or plant facilities to ensure OSHA compliance;
- Trains employees in assigned department on required safety and health regulations, policies and topics;
- Processes Workers Compensation claims; maintains OSHA required logs and records; processes automobile liability claims; maintains accident history; and
- Reviews Federal and State Registers for new or updated safety regulations; ensures assigned department complies with same.

Contractors:

Hauling/Land Application Contractor

The hauling/land application contractor is responsible for hauling the biosolids from the dewatering building underneath the conveyor belt to a concrete pad. The pad is in the south west corner of the plant property. The biosolids are temporarily stored on the concrete pad which complies with 12 VAC 5-585-500 state regulations. Biosolids are transported to off-site storage or land application. Biosolids that do not meet quality standards are taken to a landfill. The hauling/land application contractor responsibilities for management and beneficial use of anaerobically digested biosolids include but are not limited to loading, transporting, land application, testing, development of a biosolids management plan known as [O&M manual](#) , coordination with state federal and local agencies, monitoring, reporting, and participation in the city's BMP (See Biosolids Invitation For Bid [IFB](#) for more details (attached)). The hauling/land application contractor has a subcontractor that is responsible for loading and hauling biosolids to land application sites and is an integral part of the BMP value chain. Hauling/land application contractor is responsible for assigning roles and responsibilities to their staffs and subcontractors, consistent with their services agreement.

Polymer contractor:

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The City of Richmond has a 5 years contract with the polymer company to provide liquid polymer as needed and when ordered. Polymer is used in dewatering centrifuges to aid producing dryer cake.

BMP Element 8 — Training
City of Richmond Public Utilities Wastewater Treatment

Date of Last Review 10/29/19	Revision 15	Revised By Biosolids Team	Revision Date 11/10/16	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 11/10/16	

Purpose

The purpose of this procedure is to describe the training program the City of Richmond will use in its Biosolids Management Program to ensure affected employees are proficient in their BMP responsibilities and biosolids management activities.

Scope

This element applies to training related to the biosolids value chain, performed either in-house or off-site by a qualified instructor.

Responsible Staff

The Biosolids Supervisor is responsible for ensuring Biosolids and BMP-related training occurs in accordance with the following procedures. He may delegates the responsibility for conducting training to other City staff or qualified instructors as necessary. The Senior Management Analyst and Occupational Safety and Heath Specialist are responsible for training in their departments. Contractors establish their own training programs consistent with their roles and responsibilities in biosolids management activities.

Procedure

1. Training is an on-going process for all employees. Employees throughout the Wastewater Treatment Plant are encouraged to pursue professional development and job-skill training. Training opportunities include:
 - a. Certification programs. WWTP operator certification (levels 1-4) and professional training programs are available at local community colleges.
 - b. Structured on-the-job training (OJT) is provided to new employees.
 - c. Continuing Education. Workshops, seminars, and other courses with continuing education credits are offered by the VA DEQ, Water Environment Federation

(WEF), Sacramento Correspondence Courses, Mountain Empire Community College, and other professional or trade organizations.

2. Training on the City's BMP program is conducted throughout the year. The Biosolids Supervisor works with the Operations supervisors to identify employees required to receive the level of BMP training needed, based on their duties relative to the biosolids value chain.
3. BMP training can take place using any of the following formats:
 - a. Formal training meetings,
 - b. Workgroup-specific staff meetings,
 - c. Individual training from appropriate supervisors, or
 - d. Individual review of training materials.
4. Training is divided into the following areas:
 - a. General training on the biosolids, that includes an overview of the biosolids program, a description of the BMP, safety training, and emergency response information,
 - b. Advanced BMP training, which includes information on biosolids legal and quality requirements and relevant SOPs,
 - c. Biosolids operations training related to SOPs,
 - d. Safety, emergency preparedness, and spill response training, and
 - e. Training by contractors.
5. New, re-assigned, and temporary employees working in the biosolids value chain will be provided with general biosolids training relevant to their roles and responsibilities within three months of their hire or their reassignment date.
6. All employees operating the biosolids facility shall receive training on the Standard Operating procedure (SOP).
7. BMP and operations training records are kept electronically along with other training records in the electronic training database (P:\BMP - Biosolids).
8. Training for safety, emergency preparedness, and spill response is conducted on a periodic basis in accordance with Element 11.
9. Hauling/land application contractors are responsible for conducting training related to their activities.

BMP Element 9 — Communication
City of Richmond Public Utilities – Wastewater Treatment

Date of Last Review 10/30/19	Revision 15	Revised By Biosolids Team	Revision Date 11/11/16	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 11/11/16	

Purpose

The purpose of this procedure is to describe the communication and public outreach program implemented by the City’s Biosolids Management Program.

Scope

This element applies to all communication concerning the biosolids value chain and all BMP elements.

Responsible Staff

The Deputy Department Director Senior, Biosolids Supervisor, Plant Operations Superintendent & Plant Operations Supervisor Senior, Public Information Manager, Department of Information Technology, Environmental Compliance Officer, Administrative Program Support Assistant, and hauling/land application contractor are primarily responsible for Biosolids Management Program communication.

Procedure

The Public Information Manager is responsible for the process of reviewing and updating the City’s website.

Communication and public outreach may be achieved as described below.

1. Public participation in planning is listed in BMP Element 6 and reference should be made to these items. Element 6 also describes how the interested party list is generated and maintained. Public meetings are scheduled to address any concerns.
2. General regulatory and legal information are available to the public on the city’s website. A pamphlet printed by the National Biosolids Partnership (NBP) is available to provide information on biosolids.

3. City of Richmond staff will promote the biosolids program by providing tours of the WWTP and by targeting the general public and/or specific school, industrial, and business sectors.
4. Staff maintains records of all public outreach, including presentations, facility tours, and/or public meetings. Records of attendees are used to update the active list of interested parties.
5. Internal communication is critical to facilitate effective biosolids treatment, transfer, biosolids application, and compliance with regulations. The key treatment sections are listed below, with critical communication pathways noted.
 - A. Pretreatment (Environmental Compliance)
 - (1) Pretreatment informs WWTP staff and the Biosolids Supervisor of new industries that could affect the treatment system and/or biosolids.
 - (2) Pretreatment informs WWTP staff and the Biosolids Supervisor of industrial problems and high influent samples.
 - (3) Pretreatment informs WWTP staff and the Biosolids Supervisor of changes in metals loading and changes in local limits.
 - B. Operations
 - (1) WWTP staff informs pretreatment of plant problems or upsets that could have been caused by industrial discharges.
 - (2) WWTP staff informs the Biosolids Supervisor of any problems or changes regarding quality of biosolids, as well as fluctuations in quantity of biosolids generated.
 - C. Biosolids Supervisor
 - (1) Biosolids Supervisor informs WWTP staff and pretreatment of any changes in biosolids quality, including odor, appearance, solids concentrations, or regulated test parameters.
 - (2) Biosolids Supervisor informs WWTP staff of any problems with application sites, (e.g., loss of sites, complaints from the public or farm owners).
 - (3) Biosolids Supervisor communicates with the WWTP staff and pretreatment about major maintenance items scheduled, including digester cleaning, or other items that could affect treatment plant operations.
6. Internal communication with employees in the biosolids value chain also provides input on the BMP.
 - A. Communication to biosolids value chain employees includes regular training on the City's current biosolids program, and on other issues relevant to biosolids. Training is fully addressed in Element 8.

- B. Biosolids value chain employees receive other biosolids related information at regularly scheduled staff meetings, Biosolids Quarterly Reports and other means of communication.
 - C. The BMP Team also seeks input from biosolids value chain employees on the BMP including the BMP manual, biosolids goals and objectives, and internal audit procedures.
7. The City's biosolids policy is communicated to value chain staff through presentations at staff meetings, utility review, on signs placed throughout the workplace, and regular BMP training. For more information on the City's biosolids policy, see Element 2.
 8. To ensure interested parties become familiar with the biosolids policy, it is posted on the City's biosolids website, and included in presentations on the City's biosolids program.
 9. The hauling/land application contractor is responsible for communicating the City's biosolids policy to it staff and subcontractors. It also will respond in writing to all questions from regulatory agencies and site owners and will supply the City with copies of all related correspondence. The contractor also communicates with interested parties during the course of its operations, at industry, state, and local events, during permit hearings, by its membership in the Virginia Biosolids Council, and through other venues.
 10. The following methods are available to communicate with interested parties:
 - A. The City's webpage;
 - B. Tours of the WWTP;
 - C. Correspondence with regulatory and state, city, and county officials;
 - D. Annual biosolids report to Virginia Department of Environmental Quality (DEQ) and Environmental Protection Agency (EPA);
 - E. Annual Biosolids Management Program Performance Report (BMPPR);
 - F. Through its relationship with the hauling/land application contractor;
 - G. Face book, blog and Tweets; and
 - H. Biosolids Quarterly Reports.
 - I. Through its relationship with the Virginia Biosolids Council VBC.

11. Third-party audit results will be made available to the public primarily through the City's website. A summary as well as the full audit report will be posted on the website as soon as they are made available to the City.

**BMP Element 10 — Operational Control of Critical Control Points
City of Richmond Public Utilities – Wastewater Treatment**

Date of Last Review 10/30/19	Revision 15	Revised By Biosolids Team	Revision Date 11/11/16	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 11/11/16	

Purpose

The purpose of this procedure is to ensure that the city systematically establishes, implements, and maintains the necessary operational control procedures, work instructions, and other management controls.

Scope

This procedure applies to all biosolids management activities at Critical Control Points (CCP) throughout the biosolids value chain and all activities that impact the biosolids.

Responsible Staff

The Biosolids Supervisor, with support from the Plant Operations Superintendent, Plant operations supervisor senior, is responsible for providing the necessary training, guidance, and assistance in identifying, developing, documenting, and implementing needed operational control procedures. The Senior Management Analyst and Deputy Department Director Senior support these activities. Contractors are responsible for operational control of their related biosolids CCP.

Procedure

1. Based on the identified list of CCP, the BMP Team, biosolids supervisor and appropriate supervisors shall determine those activities, products, and services for which operational control procedures, work instructions, and other management control methods are needed.
2. In collaboration with biosolids value chain staff, the Plant Operations Superintendent, Plant operations supervisor senior shall provide the necessary training and guidance to support the development, implementation, and maintenance of the needed operational control procedures. The operational control procedures shall contain operating criteria (e.g., process specifications and parameters, product characteristics, and SOPs).

3. The Plant Operations Supervisors shall develop, document, and implement the operational control procedures and communicate them to their staff. BMP training shall be provided as outlined in Element 8.
4. The environmental compliance officer, biosolids supervisor and Plant Operations Supervisors shall oversee the implementation of operational control procedures in their respective activity areas. This includes ensuring employees in each activity area receive the necessary resources, training, and support services to properly implement the operational controls.
5. The hauling/land application contractor shall implement operational controls procedures consistent with its roles and responsibilities in the biosolids management activities. This includes ensuring employees receive the necessary resources, training, and support services to properly implement the operational controls.
6. Operational controls provide methods and procedures to ensure uniform and efficient management at each CCP. To show the relationship between operational controls and CCP and to streamline documentation of information, Element 10 information is integrated with CCP in Element 3, [Table 3.1](#).
7. The Preventive Maintenance (PM) routine is a combination of information from the Manufacturer's Operation & Maintenance Manual and comments and suggestions from the appropriate Trade Supervisor (Mechanical, Electrical & Instrumentation). PM Work Orders are generated, performed and time is recorded. Work Orders are then closed in the Computer Maintenance Management System (Mainsaver) which documents the process and provides a permanent record of the maintenance activities.
8. The BMP Team shall periodically review the operational control procedures, which are listed in Element 3, [Table 3.1](#). The team works with the Plant operations supervisor senior and the Plant Operations Supervisors to revise them according to any changes in the facility's CCP.

**BMP Element 11 — Emergency Preparedness and Response
City of Richmond Public Utilities – Wastewater Treatment**

Date of Last Review 10/29/19	Revision 14	Revised By Biosolids Team	Revision Date 10/28/15	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 10/28/15	

Purpose

The purpose of this procedure is to develop a plan to prepare for and respond effectively to accidents, spills, weather-related emergency situations, abnormal conditions, and other contingencies for biosolids management activities.

Scope

This procedure is critical to all real and perceived risk emergency situations concerning the biosolids management process.

Responsible Staff

The Biosolids Supervisor and BMP Team are responsible for implementing this emergency response procedure and for ensuring the regular updating of this element. The Plant Operations Superintendent supports this activity. The Occupational Safety and Health Specialist is responsible for emergency plans related to the WWTP. The biosolids supervisor is responsible for biosolids spill plan. Hauling/land application contractors are responsible for emergency preparedness and response related to their relevant biosolids activities.

Procedure

1. A copy of the Wastewater Treatment Plant emergency action Plan is available on P:\BMP - Biosolids\17 Elements\Element 11 and in the Plant Operations Superintendent’s office. This plan covers a variety of emergency situations including natural disasters, bomb threats, chemical emergencies and other crises.
2. The BMP Team has developed a plan for spills in the biosolids value chain. The plan is formally reviewed and updated as needed. The Biosolids Supervisor is responsible for coordinating the formal review and update of the plan. The plan

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establishes clear protocols for how a variety of spills should be handled. Copy of the plan is located on P:\BMP - Biosolids\17 Elements\Element 11.

3. Testing and training on safety and emergency response procedures related to biosolids are conducted on a periodic basis as determined by the BMP team and work group supervisors, in accordance with Element 8.
4. The hauling/land application contractor maintains an Emergency Response Plan to ensure effective responses to accidents, spills, and emergency situations relevant to its management activities in the biosolids value chain.

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BMP Element 12 — Documentation, Document Control, and Record Keeping				
City of Richmond Public Utilities– Wastewater Treatment				
Date of Last Review 10/30/19	Revision 15	Revised By Biosolids Team	Revision Date 11/01/18	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 11/01/18	

Purpose

The purpose of this element is to establish and maintain BMP documents and records pertaining to biosolids management activities and to keep up-to-date procedures.

Scope

This procedure covers the BMP Manual and relevant documents and records pertaining to Richmond’s Biosolids program.

Responsibility

The Biosolids Supervisor is responsible for ensuring documents conform to the adopted document control standards as set forth in the BMP Manual and this element. The BMP Team, Plant Operations Superintendent, Plant operations supervisor senior and Plant Operators support this activity. The hauling/land application is responsible for documentation and recordkeeping procedures related to its biosolids activities.

Procedure

1. Unless otherwise noted, all BMP documents will be kept in Biosolids Supervisor’s office or on the City’s server.
2. BMP documents include the BMP Manual and the Standard Operating Procedures (SOPs) and other documents referenced herein. These documents are reference documents for daily operations and will be reviewed and updated annually, or as procedures change.
 - A. BMP manual has the following information at the top of the first page:
 - Title,
 - Revision date and title,

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- Date of last review and title,
 - Approval date and title.
- B. The SOPs and the Corrective Action Reports (CAR) include in the header the following information:
- Title,
 - The originator name and date,
 - Prepared by name and date,
 - Name and date of review and approval.
- C. All BMP documents will be labeled with the correct revision number. The header of these documents may contain other information such as appropriate reference material, equipment needed, or scope at the discretion of the workgroup supervisor.
- D. Within the BMP Manual, all tables, charts, graphs, and appendices share the revision number and date of their respective element, unless otherwise indicated.
- E. Each work group supervisor is responsible for revision of work group SOPs, approval of revised SOPs, and development of new SOPs. Revision of BMP manual procedures is performed by the BMP Team. Once the revisions are accepted by the BMP Team, the Biosolids Supervisor signs each element to indicate his approval.
3. Biosolids records include daily logs, worksheets, forms, and associated reports. These documents are maintained in the office of the Plant operations supervisor senior.
4. Retention period for all documents, at a minimum of 5 years, same as required in the [VPDES permit](#) for the biosolids records (part 1 page 14, attached).
5. The Biosolids Supervisor is responsible for coordinating reviews and updates to the BMP Manual. The 17 elements in this document will be reviewed and updated as necessary. Certain elements are reviewed and updated more frequently per their specific procedure.
6. The hauling/land application contractor maintains documents and records pertaining to its role in the Biosolids Management Program. This includes SOPs and land application records. The contractor establishes relevant documentation, document control, and record procedures. Retention periods for all documents will, at a minimum, conform to applicable state document retention guidelines under Virginia DEQ.
7. All changes in the biosolids manual and elements should be documented in [Document Control Log](#).

**Element 13 — Monitoring and Measurement
City of Richmond Public Utilities – Wastewater Treatment**

Date of Last Review 10/30/19	Revision 14	Revised By Biosolids Team	Revision Date 10/28/15	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 10/28/15	

Purpose

This element covers the process used to track progress toward goals, objectives, and targets of continual improvement. Element 13 also serves the following functions:

1. Ensures compliance with applicable legal and other requirements;
2. Measures biosolids program performance at critical control points;
3. Tracks progress toward achieving biosolids program goals and objectives per Element 5 and;
4. Measures effectiveness of the BMP.

Scope

Element 13 covers all critical control points in the biosolids value chain. It documents the effectiveness of CCP, operational controls, biosolids application, public outreach, and overall BMP efforts.

Responsible Staff

The Biosolids Supervisor, Plant Operations Superintendent, Plant operations supervisor senior, Laboratory Manager, and designated staff are responsible for ensuring that all BMP aspects requiring monitoring and measuring are followed and documented. Plant operators are responsible for relevant monitoring and measurement activities related to their job functions. Contractors are responsible for monitoring and measurement related to their biosolids activities.

Procedure

1. The BMP team reviews progress toward biosolids goals and objectives. Progress is monitored using the goals and objectives in [Table 5.1](#) as stated in Element 5.

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2. All legally required monitoring and measurements are conducted at specified intervals to ensure compliance with all Federal and state regulations (See Element 4, Table 4.1 pages 12 and 13).
3. Nonconformance and corrective actions are documented in accordance with Element 14.
4. The Laboratory Manager annually evaluates performance metrics of contract laboratories used in biosolids compliance testing using results of EPA standards.
5. A key record in monitoring WWTP operations are the log sheets and log books. These logs are used to track data daily throughout the plant.
6. All records in monitoring and measuring results are stored according to the procedures in Element 12.
7. The hauling/land application contractor conducts monthly monitoring to determine biosolids land application rates. These reports are sent to DEQ on a monthly basis, with copies to the Biosolids Supervisor. Contractors are otherwise required to establish and maintain regular monitoring and measurement procedures and practices for all their assigned biosolids management activities, as defined in their [service agreements](#). (attached)

BMP Element 14 — Nonconformance: Preventive and Corrective Action City of Richmond Public Utilities – Wastewater Treatment				
Date of Last Review 10/30/19	Revision 14	Revised By Biosolids Team	Revision Date 10/28/15	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 10/28/15	

Purpose

The purpose of this BMP element is to develop procedures for identifying, investigating, and taking corrective action(s) for nonconformance.

Scope

This procedure addresses preventive and corrective action(s) to address nonconformances identified during routine monitoring and measurement, audits, and other inspections.

Responsible Staff

The Biosolids Supervisor, in conjunction with the Plant Operations Superintendent and Plant operations supervisor senior are responsible for addressing and tracking identified nonconformance and corrective actions within the biosolids value chain. Utility Plant Operators are responsible for carrying out corrective and preventive actions (CAPAs) related to their job functions.

Procedure

This element is an important key to continual improvement. When elements of the biosolids value chain deviate from requirements, it is necessary to determine the cause, change operating procedures or objectives, change training requirements, and/or address any environmental impacts that may have occurred as a result of the problem. Nonconformance conditions may be discovered in the course of day-to-day biosolids management activities or through a systematic BMP audit process.

1. Legal and regulatory noncompliance that affects, or may potentially affect, the biosolids value chain is dealt with according to the applicable regulatory requirements. Noncompliance also is considered a BMP nonconformance and processed in the same

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- manner as other nonconformance. Deadlines to meet compliance requirements identified as nonconformance are strictly enforced. The responsible supervisor must coordinate with the appropriate regulatory agency to request extensions if the supervisor anticipates problems meeting the deadline.
2. Nonconformance identified during internal or third-party audits is addressed using the BMP [Corrective Action Form](#). This form requires a description of the nonconformance, including the root cause of the condition, any applicable regulatory or other requirements, proposed corrective actions, and a description of the action taken to correct the nonconformance, among other information. Nonconformance identified during routine operations is addressed using the corrective action report.
 3. Once information is filled out in the Corrective Action Form, it is considered a Corrective Action Report (CAR).
 4. The Corrective Action Report is given to the appropriate supervisor and he/she will assign responsibility to ensure appropriate steps are taken to correct the nonconformance. The corrective action will be reviewed at subsequent meetings of the BMP Team until the action is verified and accepted and the nonconformance is closed. Review of the nonconformance includes taking steps to prevent any future recurrence of the same or similar nonconformance, such as identifying the root cause, providing additional training, etc. Any required changes to procedures, training, or other processes that are designed to prevent recurrence will be performed and documented before the nonconformance may be considered closed. Steps taken to prevent recurrence will be documented on the CAR. If the deadline for correcting a nonconformance is missed, the Biosolids Supervisor will work with the responsible supervisor to identify any resources required and to resolve the nonconformance as quickly as possible.
 5. Nonconformance associated with equipment or machinery will be assigned, documented, and tracked using the main data saver (Mainsaver). The appropriate supervisor is responsible for identifying the problem, and will notify the Biosolids Supervisor. The Biosolids Supervisor will be notified with updates on the corrective action until the nonconformance is closed.
 6. The Biosolids Supervisor is responsible for verifying the nonconformance has been completed and closed.
 7. Once a year, at a minimum, the effectiveness of all preventive and corrective actions taken will be evaluated. This will normally be performed as part of the annual Biosolids Management Program Performance Report.

BMP Element 15 — Performance Report City of Richmond Public Utilities – Wastewater Treatment				
Date of Last Review 11/22/12	Revision 11	Revised By Biosolids Team	Revision Date 11/11/12	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 11/14/12	

Purpose

The purpose of this BMP element is to describe the process of completing an annual written Biosolids Management Program Performance Report (BMPPR) that summarizes the performance of the Biosolids Management Program to drive continued improvement.

Scope

The BMPPR shall contain appropriate summaries of monitoring, measurements, and other results demonstrating the performance of the biosolids program relative to its goals, objectives, and legal requirements, including those management activities conducted by the Wastewater Treatment Plant.

Responsible Staff

The Biosolids Supervisor and BMP Team are responsible for preparing the BMPPR with input from the Utility Plant Superintendents I & II and Deputy Director I & II. The Biosolids Supervisor will ensure information from the report is made available to interested parties.

Procedure

1. The performance of the Biosolids Management Program is published in an annual Biosolids Management Program Performance Report (BMPPR) made available to interested parties, the public, and the National Biosolids Partnership no later than April 1 unless an internal or independent third party audit is scheduled during or shortly thereafter. If an audit is scheduled during or shortly after April 1, the BMPPR will be made available as soon as possible to include the summary of the audit as required by section 3 of this element.
2. The report provides evidence of the commitment to adhere to the Code of Good Practice and the City’s biosolids policy, as well as evidence the department is striving to meet all

BMP goals and objectives set out the previous year. The report also is used as a tool to foster and facilitate communication with the general public.

3. At a minimum, the BMPPR includes progress toward goals and objectives, legal and regulatory compliance, biosolids activities conducted by the hauling/land application contractor, and results of internal and/or third-party audits within the last 12 months. The report may include any or all, but not limited to, of the following:
 - A. Significant changes to the BMP
 - B. Projection of changes or additions to goals and objectives
 - C. Summary of abnormal or emergency incidents, as well as significant preventive and corrective actions taken
4. The Biosolids Supervisor ensures information contained in the BMPPR is made available to interested parties by providing copies of the report. In addition, the report is posted on the City's website.

**BMP Element 16 — Internal BMP Audit
City of Richmond Public Utilities – Wastewater Treatment**

Date of Last Review 10/30/19	Revision 14	Revised By Biosolids Team	Revision Date 10/28/15	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 10/28/15	

Purpose

The Internal BMP Audit is used to periodically analyze the BMP to determine whether the City is effectively implementing its Biosolids Management Policy, program requirements, and program goals and objectives.

Scope

This procedure applies to the entire biosolids value chain and the BMP.

Responsible Staff

The Plant Operations Superintendent designates an internal audit team to conduct the internal audit. The Plant Operations Superintendent, Plant operations supervisor senior, Deputy Department Director Senior, Biosolids supervisor and Plant Operations Supervisors will ensure resources are available to conduct the audit.

They will review and approve the audit results. The senior management analyst participates on the internal audit team. Contractors are responsible for participating in internal audits of their biosolids related activities.

Procedure

1. The overall scope of the internal audit covers the biosolids value chain and includes contractor biosolids-related activities, in accordance with their service agreements.
2. The Plant Operations Superintendent recruits the internal audit team. The Biosolids value chain staff is notified of the impending audit prior to the audit start date. Notification covers the scope, schedule, and other pertinent information.
3. The BMP internal audit team is composed of two to three individuals from various work groups within the wastewater plant. One or more audit team members may be from another agency or an independent contractor. No internal audit team member may audit an area over which he or she has direct control as part of his or her regularly assigned

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11/26/2019

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- duties. The internal audit team designates a lead auditor and identifies that person as lead auditor on all audit documents.
4. The internal audit is conducted according to the current version of the National Biosolids Partnership's Guidance.
 5. The Deputy Department Director Senior and the Plant Operations Superintendent and Plant operations supervisor senior, shall ensure audit training and resources are provided to internal audit team members. At a minimum, one member of the internal audit team will have received training from either the NBP or another source acceptable to the BMP Team. The remainder of the internal audit team, at minimum, receives training consisting of review of general auditing techniques provided by a certified auditor or another source acceptable by the BMP team, the NBP, or the internal audit lead auditor.
 6. Internal audit is conducted every year and covers all BMP elements. Results of the internal interim audit must be summarized in a report that is made available to the BMP team, management, interested parties, and the NBP.
 7. The specific scope of each internal audit may vary. Each internal audit may examine any or all activities related to the biosolids value chain. However, every internal audit must investigate whether the program is conforming to the biosolids policy and program requirements, and whether it is making progress toward goals and objectives. The internal audit team develops the audit scope based on these required elements as well as the following:
 - A. The potential environmental impacts of biosolids activities;
 - B. Results of previous audits, including third-party audits;
 - C. Changes or modifications to processes or procedures; and
 - D. Changes in requirements stipulated by applicable environmental laws and regulations (local, state, and federal).
 8. The internal audit team is responsible for ensuring audit protocols and procedures are in place to focus on the objective evidence relating to the biosolids program. Specific duties include, but are not limited to:
 - A. Developing the audit schedule. The specific audit activities are scheduled with tentative time frames by the internal audit team and are given to the Biosolids Supervisor no later than one week prior to the audit. Each internal audit includes an opening meeting with the BMP Team, a schedule for interviews and transaction testing, a summary meeting with the Biosolids Supervisor, and a closing meeting with the BMP Team;
 - B. Determining the method for conducting the audit, including assigning audit responsibilities and determining appropriate methods for collecting objective evidence;

- C. Using [checklist](#) form and [report](#) for all internal audits as template, a copy is saved on P drive/BMP Biosolids/Element16;
 - D. Using standard forms such as corrective action request forms, audit assessment forms, or developing new forms if necessary.
 - E. Determining how corrective and preventive actions will be verified for effectiveness, in accordance with Element 14.
9. Auditors conduct a closing meeting to discuss identified nonconformance and/or deficiencies with the BMP. At this time, the BMP Team may present any final evidence concerning the audit findings.
10. The lead auditor is responsible for writing the internal audit report itemizing all findings and identifying them as major nonconformance, minor nonconformance, or opportunities for improvement. A summary of these findings is presented in the Biosolids Management Program Performance Report. This report is posted on the City of Richmond, Department of Public Utilities Biosolids' Website.
11. The BMP Team summarizes the internal audit results, including the internal audit report, recommended corrective actions, and a schedule for corrective actions. Audit results are given to the Deputy Department Director Senior and the Plant Operations Superintendent for their review and approval.
12. Nonconformance identified in the internal audit is addressed using procedures in Element 14.
13. The Biosolids Supervisor ensures internal audit records are maintained on the City's server. These records should include:
- A. Description of each audit's scope, schedule, protocol and methodology;
 - B. Identification of the lead auditor and his/her qualifications;
 - C. The Internal Audit Report; and
 - D. Other records that describe the content and conduct of the internal audit, as necessary.

BMP Element 17 — Periodic Management Review of Performance City of Richmond Public Utilities – Wastewater Treatment				
Date of Last Review 10/30/19	Revision 14	Revised By Biosolids Team	Revision Date 10/28/15	Supersedes all previous versions
		Approved By Biosolids Supervisor	Approval Date 10/28/15	

Purpose

The purpose of this element is to describe how the City conducts periodic management reviews of the suitability, adequacy, effectiveness, and performance of the biosolids management program in order to drive continual improvement.

Scope

The Management Review will discuss the possible need to change policy, goals and objectives, biosolids management program, and other BMP elements based on internal BMP audit results, external verification of BMP audits by third parties, changing circumstances, and the commitment to continual improvement.

Responsible Staff

The Biosolids Supervisor and BMP Team are responsible for compiling information for the periodic review of the biosolids management program. The Deputy Department Director Senior and Plant Operations Superintendent and Plant operations supervisor senior conduct the review.

Procedure

1. The Biosolids Supervisor and the BMP Team compile information from the following sources, among others:
 - A. Annual Biosolids Report to DEQ;
 - B. Biosolids Management Program performance Report;
 - C. Audit Summaries (internal and/or third party);
 - D. Quarterly Summary of Biosolids monthly Reports ;

- E. Corrective Action Reports;
 - F. Regulatory Updates; and
 - G. Input from Interested Parties.
2. The Biosolids Supervisor schedules and conducts a Management Review meeting on a yearly basis. The Plant Operations Superintendent, Plant operations supervisor senior and Biosolids Supervisor are responsible for review of the information and any changes in the BMP.
 3. The Biosolids Supervisor prepares a written summary of the management review meeting. Any actions or recommendations from the management review meeting are documented. The written summary is then provided to the BMP Team.
 4. The management review may generate corrective and preventive actions related to specific activities or to biosolids management program elements. These are addressed in accordance with Element 14.