

**Element 3: Biosolids Value Chain and Critical Control Points – Background**

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**BACKGROUND**

This element ensures that the Metro District identifies and documents critical control points along the biosolids value chain, and what their potential or actual environmental impacts might be. By doing this, the District can plan and implement operational controls to ensure that the best management practices of its biosolids activities are being applied.

The District’s EMS Workgroup established its biosolids value chain and critical control points consistent with the District’s Biosolids Reuse Policy and the management of its biosolids activities from planning through final disposition. Potential and actual environmental impacts for each critical control point are also identified.

The biosolids value chain, critical control points, and environmental impacts may change due to new municipal/industrial/commercial discharges, new legal/regulatory/permit requirements and modifications to biosolids treatment technology and methods of disposition. A procedure for making revisions to these processes requires the EMS Workgroup to perform an annual review at a minimum. If at any time processes change during the year, the EMS Workgroup will identify them and follow the procedures as outlined in this element. The NBP, the third party auditor, and interested parties will be notified of any significant changes made in the Districts biosolids value chain or critical control points. Input or concerns from Interested Parties will be considered.

Critical control points have associated operational controls with monitoring and measurement standard operating procedures (SOPs) that describe the operating procedures, practices, monitoring, measurement, testing and/or inspection methods used to assure that biosolids and biosolids activities meet applicable legal, quality, environmental protection, and public acceptance requirements. The operational controls monitoring and measurement SOPs associated with critical control points identified in Element #3 - List can be found in Element #10 - Table of this manual. Biosolids value chain signs have been placed at critical control points throughout the District to identify these processes for employees.

To ensure the District’s EMS Workgroup established its biosolids value chain, critical control points, and operational controls consistent with those identified in the National Manual of Good Practice (NMGP), documentation describing the process used by the EMS Workgroup is available upon request. This documentation includes memos and a comparison table of the biosolids value chain, critical control points, and operational controls. The comparison table also shows the terminology differences used in the NMGP and those used at the District. Following is the District’s biosolids value chain as established by the District’s EMS Workgroup:

- Planning
- Wastewater Transmission & Pretreatment
- Wastewater Treatment & Solids Processing
- Biosolids Processing
- Biosolids Handling & Transport
- Biosolids Recycling & Alternatives

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**PURPOSE**

To describe the process used by the District to revise the biosolids value chain, critical control points, and their environmental impacts for managing its biosolids activities.

**SCOPE**

This procedure will ensure legal, quality, environmental protection, and public acceptance requirements for continual improvement are being met. The procedure covers all the management categories in the biosolids value chain from planning to final disposition of biosolids.

**REFERENCES**

- NBP National Manual of Good Practice
- Element #2: Biosolids Management Policy
- Element #3: Biosolids Value Chain and Critical Control Points – List
- Element #5: Goals and Objectives
- Element #6: Public Participation
- Element #10: Operational Control of Critical Control Points
- Element #12: Management for Revising EMS Documents
- Element #13: Monitoring & Measurement

**DEFINITIONS**

**Biosolids Value Chain** – sequence of activities from planning, wastewater pretreatment, discharge and collection through wastewater treatment, solids treatment and handling, storage, transportation, and final disposition of biosolids that impact the quality and stability of biosolids and their suitability for the selected management method.

**Critical Control Points** – those locations, unit processes, events, and activities throughout the biosolids value chain under the organization’s direct control or influence that require effective policies, programs, procedures, practices, monitoring and measurements to assure the biosolids activities meet applicable legal, quality and public acceptance requirements and do not have undesirable environmental impacts. Critical control points include all biosolids management activities that are covered under applicable legal and other requirements.

**Operational Controls** – ordinances, regulations, standard operating procedures, practices, technology, instrumentation and process controls, monitoring and other criteria developed, implemented, and maintained by an organization to ensure effective management of all critical control points associated with its biosolids management activities; including conformance with biosolids management policy requirements; and achievement of biosolids program goals and objectives.

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**Environmental Impacts** – Any change to public health or the environment as a result of the District's biosolids activities.

**RESPONSIBLE PERSONS**

- EMS Coordinator
- EMS Workgroup
- Department Heads

**RELATED TRAINING**

For related training, please refer to Element #8 of this manual.

**PROCEDURAL STEPS**

1. Each year, the EMS Workgroup will review the current biosolids value chain, the critical control points, and the environmental impacts to identify any revision(s) needed to reflect the process changes. If at any time process changes occur during the year, the EMS Workgroup representative for the department where the process change is occurring will notify the EMS Coordinator who may request input from other EMS Workgroup members as needed.
2. The EMS Coordinator will compile the proposed revision(s) from the EMS Workgroup for review and, if appropriate, approve them. Recommended revision(s) from the EMS Workgroup not approved by the EMS Coordinator shall be returned to the EMS Workgroup with a written explanation of concern(s) related to the revision(s).
3. The EMS Coordinator will present the concern(s) to the EMS Workgroup and initiate steps for resolution.
4. When the concerns are resolved the EMS Coordinator will revise and approve as appropriate.
5. The EMS Coordinator will initiate the Element #12 - Management for Revising EMS Documents procedure and make the approved revisions to the biosolids value chain, the critical control points, and the environmental impact documents.
6. The EMS Coordinator will notify the EMS Workgroup of the Intranet revisions via email.
7. The EMS Coordinator will notify NBP, the assigned third party verification auditor, and interested parties of any operational changes that requires a change to the identified biosolids value chain, critical control points, or environmental impacts associated with the critical control points.

Metro Wastewater Reclamation District  
Environmental Management System for Biosolids

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**PURPOSE**

To summarize the biosolids value chain, critical control points, and environmental impacts applicable to the District’s biosolids management activities.

**SCOPE**

The following tables summarize the current list of the biosolids value chain, critical control points, and environmental impacts. The list specifies impacts that could occur if critical control points at the Robert W. Hite Treatment Facility (RWHTF) or at the METROGRO Farm or other disposal alternative are not managed properly.

The Operational Controls with monitoring and measurement SOPs related to these critical control points can be found in Element #10-Table.

**BIOSOLIDS VALUE CHAIN – I. PLANNING**

Metro District Critical Control Points	Potential/Actual Environmental Impacts
A. Funding, Study, Design, & Construction	<ul style="list-style-type: none"> <li>• Effective planning ensures that adequate facilities, operational resources, and financial resources are available to treat wastewater in the District’s Service Area. This work effort results in reduced or eliminated pollution to surface waters, risks to public health and aquatic biota, and poor quality biosolids.</li> </ul>

**BIOSOLIDS VALUE CHAIN – II. WASTEWATER TRANSMISSION & PRETREATMENT**

Metro District Critical Control Points	Potential/Actual Environmental Impacts
A. Industrial Users B. Significant Industrial Users C. Hauled Waste D. Connectors	<ul style="list-style-type: none"> <li>• Pretreatment helps to prevent deleterious wastes from entering the interceptor system that could result in explosions, pipe corrosion, and threats to public health and the environment. Discharge of toxic substances such as heavy metals &amp; synthetic organics is controlled to prevent treatment plant process upsets and potential unacceptable biosolids quality.</li> </ul>

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**BIOSOLIDS VALUE CHAIN – III WASTEWATER TREATMENT & SOLIDS PROCESSING**

Metro District Critical Control Points	Potential/Actual Environmental Impacts
<p>A. Headworks, Debris and Grit Removal                      B. Primary Treatment                      C. South Secondary Treatment                      D. North Secondary Treatment                      E. Solids Thickening (DAF)</p>	<ul style="list-style-type: none"> <li>• Proper operation removes trash and debris that can negatively impact the reliability of downstream processes and biosolids aesthetic quality. Operational performance of the RWHTF can be impacted by flow distribution.</li> <li>• Anaerobic digestion process performance and the associated biosolids quality can be impacted by the primary sludge feed stream that is produced during primary treatment. Primary treatment operations can also impact secondary treatment operations, which also produces feed sludge for digestion.</li> <li>• Anaerobic digestion process performance and the associated biosolids quality can be impacted by the characteristics of the secondary sludge stream that is produced during secondary treatment.</li> <li>• Anaerobic digestion process performance and the associated biosolids quality can be impacted by the characteristics of the secondary sludge stream that is produced during secondary treatment.</li> <li>• Anaerobic digestion process performance and the associated biosolids quality can be impacted by the characteristics of the thickened waste activated sludge stream that is produced during DAF treatment.</li> </ul>

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**BIOSOLIDS VALUE CHAIN – IV. BIOSOLIDS PROCESSING**

Metro District Critical Control Points	Potential/Actual Environmental Impacts
A. Anaerobic Digestion B. Dewatering (Centrifuge)	<ul style="list-style-type: none"> <li>Odors. In addition, anaerobic digestion is operated and maintained to meet biosolids stabilization requirements such as pathogen and vector attraction reduction. Proper digestion produces a stable biosolids material that can be used as a fertilizer in a sustainable manner with minimal risk to human health and the environment.</li> <li>Odors. In addition, inefficient biosolids dewatering increases the volume of biosolids to be transported resulting in increased traffic volume and its associated increase in fuel consumption, air pollution and its health risks as well as general road safety risks.</li> </ul>

**BIOSOLIDS VALUE CHAIN – V. BIOSOLIDS HANDLING & TRANSPORT**

Metro District Critical Control Points	Potential/Actual Environmental Impacts
A. Biosolids Hopper (Storage) B. Vehicle Maintenance C. Truck Loading & Transport	<ul style="list-style-type: none"> <li>Odors. In addition, the cake hopper provides a buffer between truck hauling schedules and dewatering schedules that allows each process to be effectively operated. Use of the cake hopper allows the RWHTF to be operated on a consistent basis and produce a high quality effluent.</li> <li>Vehicle maintenance is performed to minimize air pollution and its health hazards, and the risk of accidents that compromise safety, health, and the environment.</li> <li>Proper truck loading at the hopper facility will ensure truck cleanliness and reduce stray biosolids outside the loading area. In addition, biosolids transport operators and maintenance personnel are trained, tested and licensed for knowledge and skills to minimize risks to human health, safety and the environment resulting from vehicular accidents and biosolids spills and leaks. Transport vehicles are operated and routed to minimize health hazards from road dust and noise.</li> </ul>

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**BIOSOLIDS VALUE CHAIN – VI. BIOSOLIDS RECYCLING & ALTERNATIVES**

<b>Metro District Critical Control Points</b>	<b>Potential/Actual Environmental Impacts</b>
<ul style="list-style-type: none"> <li>A. Restricted Distribution - Classification &amp; Use of Biosolids</li> <li>B. Restricted Distribution – Application Site Location</li> <li>C. Restricted Distribution – Letter of Intent for Biosolids Permits Process</li> <li>D. Restricted Distribution – Application Near State Waters</li> <li>E. Restricted Distribution – Groundwater Restrictions</li> <li>F. Restricted Distribution – Slope Requirements</li> <li>G. Restricted Distribution – Nutrient Requirements</li> <li>H. Restricted Distribution – Crop Restrictions</li> <li>I. Restricted Distribution – Access Restrictions</li> <li>J. Restricted Distribution – Biosolids Staging Area</li> <li>K. Restricted Distribution – Biosolids Application</li> <li>L. Restricted Distribution – Disposal Facility</li> </ul>	<ul style="list-style-type: none"> <li>• Determine the classification of biosolids so that the appropriate end use can be carried out in order to protect human health, the environment, and endangered species or their habitats.</li> <li>• Evaluate sites and communicate all access and use restrictions to the property owner for the protection of human health and the environment.</li> <li>• Prepare/submit federal, state, and local permits so that regulatory agencies can conduct inspections etc to ensure protection of human health and the environment.</li> <li>• Biosolids activities that utilize regulatory criteria and Best Management Practices to prevent runoff into surface water and drainage ways to protect human health and the environment.</li> <li>• Biosolids activities that utilize regulatory criteria and Best Management Practices to prevent infiltration to groundwater in order to protect human health and the environment.</li> <li>• Biosolids activities that utilize regulatory criteria and Best Management Practices to prevent application to excessive slopes in order to protect human health and the environment.</li> <li>• Biosolids activities that utilize regulatory criteria and Best Management Practices to prevent excessive nutrient application in order to protect human health and the environment.</li> <li>• Biosolids activities that utilize regulatory criteria and Best Management Practices to prevent crop production that might pose health risks in order to protect human health and the environment.</li> <li>• Biosolids activities that utilize regulatory criteria and Best Management Practices to prevent public access and livestock exposure in order to protect human health and the environment.</li> <li>• Biosolids activities that utilize regulatory criteria and Best Management Practices to prevent runoff, infiltration, or accumulation of biosolids at staging areas in order to protect human health and the environment.</li> <li>• Biosolids activities that utilize regulatory criteria and Best Management Practices to prevent the application of biosolids in a manner that might threaten human health and the environment.</li> <li>• A private composter accepts biosolids and digester cleanout material based on terms specified in the current LOA and is utilized when biosolids quality is unsuitable for land application or when poor field conditions exist. In the event the private composter cannot handle the District’s daily biosolids production, biosolids will be diverted to a landfill.</li> </ul>