

<p align="center">BMP Element 1— Documentation City of Richmond Public Utilities – Wastewater Treatment</p>				
<p>Date of Last Review 11/18/16</p>	<p>Revision 15</p>	<p>Revised By Biosolids Team</p>	<p>Revision Date 11/07/16</p>	<p>Supersedes all previous versions</p>
		<p>Approved By Biosolids Supervisor</p>	<p>Approval Date: 11/07/16</p>	

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, Public Utilities Deputy Director II, Utility Operations Superintendents, Environmental Compliance Officer, Utility 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.