



Wastewater Plant Biosolids BMP Internal Audit Report

City of Richmond, Virginia

Wastewater Treatment Plant

The Wastewater Treatment Facility operates along the south bank of the James River. The facility is permitted to treat 45 MGD dry weather flow and a minimum of 75 MGD wet weather flow. Richmond's Wastewater Treatment Facility serves customers in the City, Henrico, Chesterfield, and Goochland counties. The facility is one of the largest of its kind in Virginia. The Wastewater Utility also operates and maintains 1,500 miles of sanitary sewer, pumping stations, 38 miles of intercepting sewer lines, the Shockoe Retention Basin and McCloy Tunnel, and operates the combined sewer overflow (CSO) control program. The facility has Pretreatment, Laboratory, Technical Services, Engineering, and Financial/Administrative sections to support plant operations and maintenance.

<u>Audit Performed By:</u>	Wastewater Plant Internal Audit Team - Donald Carter - Project Management Analyst & Lead Auditor - Barbara Jackson - Shockoe Supervisor & Assistant Auditor
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<u>Audit Dates:</u>	October 30th 2017
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<u>Report Date:</u>	October 30th, 2017
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<u>References:</u>	NBP BMP Elements National Manual of Good Practice for Biosolids NBP – Third Party Verification Auditor Guidance – August 2011 Wastewater Plant Biosolids Management Program (BMP)
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<u>List of Auditees:</u>	Ricky Hatfield - Deputy Director (Special Assignment as Deputy Director) Nouredine Ezzineelamghari - BMP Supervisor Clair Watson - Operations Superintendent II Ed Edmondson - Operations Superintendent I Eric Whitehurst - Environmental Compliance Officer Cordell Hayes - Program Manager - Facilities Audrey Brubeck - Laboratory Manager Richard Thomas - Chief Operator Utility Operator - Ben Young Nutriblend - Land Application Contractor (Truck Driver) Donald Carter - CMMS Administrator - Maintenance Program
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<u>Introduction:</u>	The Internal Audit Team investigated whether the City of Richmond's Wastewater Treatment Plant's BMP Biosolids System supports improvements in four key outcome areas. Those areas are: Quality Management Practices, Relations with Interested Parties, Regulatory Compliance & Environmental Performance. The Internal Audit Team verified those areas by performing the following: Document and Records Review, Interviews & Direct Observation.
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<u>Scope & Objectives:</u>	The Audit Scope applies to the entire Biosolids value chain and the BMP. Our objective was to determine whether the City of Richmond's Wastewater Treatment Plant is effectively meeting its Biosolids Management Policy, program requirements, program goals and objectives.
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<u>Methodology:</u>	We followed the guidelines provided in the NBP Third Party Verification Auditor Guidance Manual. We reviewed each of the BMP Elements and determined if they conformed to the NBP Elements for an BMP. We used a Question Checklist Document to cover all of the BMP Elements. The Questions came from the NBP Third Party Verification Auditor Guidance Manual (August 2011 Edition). We also conducted some personal interviews and field observations.
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<u>Overall Evaluation:</u>	Based on our Internal Audit Results, we feel that the City of Richmond's Wastewater Treatment Plant is in conformance with the major components of the BMP program.
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Element 1: Documentation	
Finding:	The Internal Audit Team agrees that Element 1 - Documentation is in Conformance. The Biosolids Team has prepared a well written and thorough Manual. The Team has a Hard Copy as well as a Electronic Copy on the common P: Drive in the BMP - Biosolids folder.
Recommendation:	Continue to regularly update the BMP Manual. Make sure the BMP Manual is reviewed in the calendar year that the Audit is performed. (Internal & External).

Element 2: Biosolids Management Policy	
Finding	The Internal Audit Team agrees that Element 2 has a Major Non-Conformance.
Major Non-Conformance	<u>The Internal Audit Team discovered a Major Non-Conformance relating to this Element. The Major Non-Conformance is in reference to BMP Quality Practices. Item 5.) Quality Practices: To require good housekeeping practices for biosolids production, processing, transport and storage and during final use or disposal operations. Numerous examples of poor housekeeping were observed and documented by the Field BMP Internal Auditor. The major areas documented included: All 3 Grit Pads, Dewatering Office where samples are weighed & the Truck Driver area under the Biosolids chute. Each of these areas were not in compliance and were deemed bad enough to sight a Major Non-Compliance.</u>
Recommendation:	Recommend a corrective action plan to address all of the Housekeeping issues documented by the BMP Field Auditor. Develop a Quarterly Housekeeping Checklist and assign responsibility for execution of the Housekeeping Plan and Checklist.

Element 3: Critical Control Points	
Finding:	The Internal Audit Team agrees that Element 3 - Critical Control Points is in Conformance. The Critical Control Points are regularly reviewed, updated and tracked in a Table.
Opportunity for improvement	Continue to organize Electronic Files with a regimented File Naming Convention so that they are easy to find & organize.

Element 4: Legal and Other Requirements	
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Finding:	The Internal Audit Team agrees that Element 4 - Legal and Other Requirements is in Conformance. The Legal and other Requirements are regularly reviewed, updated and tracked in a Table. The Deputy Director & Utility Plant Superintendent are responsible for identifying & tracking the requirements.
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Recommendation:	No formal recommendation other than continuous improvement.
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Element 5: Goals and Objectives for Continuous Improvement	
Finding:	The Internal Audit Team agrees that Element 5 - Goals and Objectives for Continuous Improvement is in Conformance.
Opportunity for improvement	Recommend regularly reviewing maintenance activities with the Maintenance Program Manager - 1.) Ratio of Preventive vs Corrective Work Orders. 2.) Average Days to close a Work Order.

Element 6: Public Participation Planning	
Finding:	The Internal Audit Team agrees that Element 6 - Public Participation Planning is in Conformance. Nutriblend assists in this Element and the goals are communicated thru the City Website, Annual Reports and Utility Review.
Recommendation:	No formal recommendation other than continuous improvement.

Element 7: Roles and Responsibilities	
Finding:	The Internal Audit Team agrees that Element 7 - Roles and Responsibilities is in Conformance. Roles and Responsibilities are documented in a table. Sufficient resources, funds and technical skills have been allocated to the Biosolids BMP.
Opportunity for improvement	Take steps to improve communication and define each individuals responsibility in relation to the Biosolids Value Chain. This includes all WWTP employees. Recommend that the lab assign someone to spot check the temperature in the (2) refrigerators where Biosolids samples are stored. Temp range 2-6 degrees.

Element 8: Training	
Finding:	The Internal Audit Team agrees that Element 8 - Training has a Minor Non-Conformance.
Minor Non-Conformance	The Minor Non-Conformance is in reference to the Auditor's interview with the Chief Operator. The Chief Operator is responsible for the entire WWTP Plant Operation including the Biosolids Value Chain. The interview revealed that the Chief Operator needed additional training concerning the Biosolids operation.
Recommendation	BMP Supervisor needs to co-ordinate his training efforts for Chief Operators thru the Utility Superintendents I & II. This effort should be documented and we would recommend a Quarterly Training Session.
Opportunity for improvement	Make sure new employees are trained. Always Document Training sessions and provide a Sign-In sheet. Involve the Chief Operators in the Training Process. Better define roles of employees trained to include Shockoe, Operations and Maintenance. Keep list up to date. (New Employees & Those no longer Employed). Recommend additional interested WWTP Employees be sent every calendar year to formal EMS Training at VA Tech. This can include BMP Team Members and other interested WWTP Employees.

Element 9: Communication and Outreach	
Finding:	The Internal Audit Team agrees that Element 9 - Communication and Outreach is in Conformance. This is accomplished thru the City's Communication Division and the efforts of Nutriblend. The communication efforts need to be expanded and delivered regularly.



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Opportunity for improvement	Continue to regularly communicate with Nutriblend & the City's Communication Division and thoroughly understand their efforts. The entire Communications Staff can be utilized as necessary without relying solely on the Communication Manager.
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Element 10: Operation Control of Critical Points	
Finding:	The Internal Audit Team agrees that Element 10 - Operation Control of Critical Points is in Conformance. SOP's are complete for Dewatering. Preventive and Corrective Maintenance activities are handled by Mainsaver (Maintenance System).
Opportunity for improvement	Recommend monitoring Open Work Orders that are old and on Critical Equipment that needs to be fixed. (On-going).



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Element 11:	Emergency Preparedness and Response
Finding:	The Internal Audit Team agrees that Element 11 - Emergency Preparedness and Response is in Conformance. We have SOP's for Emergencies. Nutriblend also has a spill response manual and equipment for their emergencies.
Recommendation:	No formal recommendation other than continuous improvement. Recommend adding Spill Kit Identification Signs.
Element 12:	BMP Documentation, Document Control & Record Keeping
Finding:	The Internal Audit Team agrees that Element 12 - BMP Documentation, Document Control & Record Keeping is in Conformance. All relevant Documents are written and available on the P:\ Drive in the BMP - Biosolids folder.
Recommendation:	Continue to organize Electronic Files with a regimented File Naming Convention so that they are easy to find & organize. Encourage that all WWTP employees request access to the "P" Drive. This would be a Read-Only Access to the BMP Folder. The request needs to be routed thru the employees supervisor. (SAPR Form)
Element 13:	Monitoring and Measurement
Finding:	The Internal Audit Team agrees that Element 13 - Monitoring and Measurement is in Conformance. Good housekeeping and proper Sampling Procedures must be followed to also insure good samples are provided. Monitoring and Measurement is captured on LIMS, OP10 and various Excel Spreadsheets.
Opportunity for improvement	Stay on top of any Housekeeping Issues - Year Round.
Element 14:	Nonconformance - Preventive & Corrective Action
Finding:	The Internal Audit Team agrees that Element 14 - Nonconformance - Preventive & Corrective Action is in Conformance. The Internal Auditors verified that procedures are being followed and corrective actions are initiated when required. Auditors reviewed a couple of Corrective Action Reports.
Recommendation:	No formal recommendation other than continuous improvement.
Element 15:	Performance Report
Finding:	The Internal Audit Team agrees that Element 15 - Performance Report is in Conformance. The BMP Team has completed the 2016 Report.
Recommendation:	No formal recommendation other than continuous improvement.
Element 16:	Internal BMP Audit
Finding:	The Internal Audit Team agrees that Element 16 - Internal BMP Audit is in Conformance. The Internal Audit Checklist helped us verify that the Internal Audit had covered all 17 Elements.
Opportunity for improvement	Formally train additional Internal Auditors. This provides additional resource.



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Element 17: Periodic Management Review of Performance	
Finding:	The Internal Audit Team agrees that Element 17 - Periodic Management Review of Performance is in Conformance. The BMP Team did have a meeting with the Deputy Director and several topics were discussed. The Internal Auditors verified this took place.
Opportunity for improvement	Recommend that a dedicated resource be given for document & meeting management Administrative help. Have more than one Management Review meeting.

Internal Audit Conclusion	
The Internal Audit Team reviewed the Biosolids BMP Manual and all of the 17 Elements. We have concluded that the Biosolids BMP System is in compliance. Great job this year! The BMP Supervisor is knowledgeable and dedicated to the program. There was one Major Non-Conformance and one Minor Non-Conformance as well as 9 Opportunities for Improvement addressed.	