



Report

Biosolids Management Program Interim Audit

City of Raleigh Public Utilities Department Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

Audit Conducted By:

DEKRA Certification, Inc. (Chalfont, PA)

Auditors: Mr. Jon Shaver (Lead Auditor)

Report Written By: Jon Shaver, Biosolids EMS Lead Auditor

Report Date: March 6, 2013

Technical Review By: Ms. Marti Gibson, EMS Coordinator, City of Raleigh Public
Utilities Department

Report Approved By: Pierre Salle, President - DEKRA Certification, Inc.

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY	3
2	AUDIT DETAILS.....	4
2A	Agency Details and Biosolids Program	4
2B	Audit Dates	4
2C	Audit Purposes, Criteria and Scope	4
2D	Audit Team	5
2E	Audit Methodology	5
2F	Reference Materials.....	5
2G	Definitions of Audit Findings and Required Corrective Action.....	6
2H	Appeals.....	6
2I	Additional Information	6
3	SUMMARY OF AUDIT RESULTS	7
3A	Verification Conclusion.....	7
3B	Strengths Observed	7
3C	Audit Findings – Nonconformances.....	7
3D	Plans For Closure of Nonconformances.....	8
3E	Closed Nonconformances from Prior DEKRA Audits	8
3F	Agreements	8
4	DETAILED AUDIT RESULTS.....	9
4A	Outcomes	9
4B	Management System Dynamics.....	9
4C	Process Audits	11
4D	Audit Findings	11
4E	Opportunities for Improvement.....	11
	APPENDICES.....	13
	Appendix 1 List of Participants	13
	Appendix 2 Documentation / Objective Evidence Reviewed.....	14

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

1 EXECUTIVE SUMMARY

DEKRA Certification Inc. (DEKRA) conducted an independent audit of the environmental management system being used by City of Raleigh Public Utilities Department (CORPUD) in managing its biosolids program. The audit was conducted February 20 to 22, 2013 at CORPUD's request as part of its participation in the National Biosolids Partnership (NBP) Biosolids Management Program (BMP). It was the first interim audit in the second verification cycle following DEKRA's verification of the CORPUD biosolids management program in 2012.

The purposes of this audit were to:

- Verify that management of CORPUD biosolids activities meets requirements of the NBP BMP, in particular the 17 BMP Elements (audit criteria).
- Confirm that CORPUD is managing its biosolids program effectively and in a manner that meets NBP expectations, with practices and procedures being performed as documented.
- Examine outcomes that CORPUD is achieving through the use of a management-system approach to managing its biosolids program.

The audit scope covered parts of the CORPUD biosolids program, including processes and activities used by CORPUD in managing its biosolids program as defined in the agreed Interim Audits Program.

Audit Results and Conclusions

During this audit, DEKRA found no major nonconformances and 3 minor nonconformances with respect to the audit criteria. CORPUD developed corrective action plans for the nonconformances and DEKRA's Lead Auditor reviewed and approved these action plans. Verification of effective corrective action will be included in the next third-party audit, currently planned for January 2014.

Based on the results of this audit, DEKRA concludes that:

- The CORPUD biosolids environmental management system is consistent with NBP expectations and meets requirements of the NBP BMP Elements.
- Use of a management system approach is generating positive outcomes for CORPUD's biosolids program in the areas of regulatory compliance, environmental performance, quality practices, and relations with interested parties.

DEKRA continues our verification that the CORPUD biosolids management program meets NBP expectations and requirements and we recommend continuing certification of that biosolids program within NBP's Biosolids Management Program.

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

2 AUDIT DETAILS

2A Agency Details and Biosolids Program

Agency Detail

Agency Name: City of Raleigh Public Utilities Department, Raleigh NC (referred to as CORPUD in this report)

Biosolids Preparation Sites: Neuse River Wastewater Treatment Plant, Battle Bridge Road, Raleigh North Carolina

Number of Employees: 105

Volume of Wastewater Treated: 40 MGD (average); capacity 75MGD

Biosolids Produced: 16,000 dry tons per year (total Class A + B)

Biosolids Use Options: agriculture land application (Class A and Class B), composting (dewatered sludge)

CORPUD Biosolids Program

CORPUD's Biosolids Program includes defined processes for Pretreatment, Wastewater Treatment and Solids Generation, Solids Stabilization, Dewatering, Biosolids Storage and Transportation and Biosolids Use (2 use options). Contractors have responsibilities for managing biosolids transportation and end use options. CORPUD manages its biosolids program using a management system approach that is planned to conform with the NBP BMP Elements.

2B Audit Location and Dates

This Interim Audit was conducted on-site at the Neuse River Wastewater Treatment Plant February 20 to 22, 2013.

2C Audit Purposes, Criteria and Scope

Purposes

This audit was an interim audit, as defined in the NBP Biosolids Management Program. Its purposes were to verify CORPUD Environmental Management System (for its biosolids program) is functioning effectively and continues to meet NBP expectations & requirements of the NBP BMP Elements.

Audit Criteria

The audit criteria used were the requirements of the NBP BMP Elements (July 2011) and CORPUD's Biosolids Environmental Management System defined in its EMS Manual.

Scope of Work

The scope of the audit included parts of the CORPUD biosolids program, which includes pretreatment, wastewater treatment and solids generation, solids stabilization, dewatering, biosolids transportation, biosolids use / disposition, with special attention to practices and management activities that directly support biosolids-related operations, processes and activities.

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

The audit included the following topics, consistent with agreed Scope of Work and Interim Audits Program.

Process Audits:

- Biosolids Use – Land Application
- Competency, Awareness & Training
- Compliance (with legal & other requirements)
- Control of Contractors
- Corrective and Preventive Action
- Critical Control Points & Operational Controls (identification)
- Goals & Objectives (for improvement)
- Internal Audits
- Pretreatment
- Management Involvement (incl policy, planning, mgmt review)

Management System Dynamics

Closure of open nonconformances

Examination of Outcomes

Interested Party Interviews

2D Audit Team

CORPUD authorized DEKRA Certification Inc. to conduct this third party audit. DEKRA's Lead Auditor was Mr. Jon Shaver. Mr. Shaver is certified by NBP as a Biosolids EMS Lead Auditor and Biosolids Auditor. DEKRA asserts that our firm and auditors have an independent relationship with CORPUD that meets NBP criteria for Third-Party Audit Companies and Auditors.

2E Audit Methodology

DEKRA conducted this audit following guidelines provided in the NBP Auditor Guidance Manual (August 2011). Using sampling techniques, the auditor observed practices in place, interviewed key persons with biosolids responsibilities, and reviewed pertinent documents and records to assess the effectiveness of the management system and its consistency with written procedures and NBP requirements. Transaction tests were performed to verify the health and effectiveness of the management system. This audit was conducted as a systems audit and is not a verification of compliance with any legal requirements applicable to biosolids practices performed by CORPUD or its contractors.

2F Reference Materials

The following documents were used as references during this audit:

- CORPUD EMS Manual (current version)
- National Biosolids Partnership BMP Elements (July 2011)
- National Biosolids Partnership Biosolids EMS Third Party Auditor Guidance (August 2011)
- National Biosolids Partnership Code of Good Practice
- National Biosolids Partnership Manual of Good Practice

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

2G Definitions of Audit Findings and Required Corrective Action

Major Nonconformance – a serious omission from requirements and/or other departure that represents, or could cause, a systemic failure. Major nonconformances must be corrected within 90 days for DEKRA's verification to be issued.

Minor Nonconformance – an isolated departure from requirements that does not represent a systemic failure. Minor nonconformances require timely and effective corrective action. A certified DEKRA auditor must verify the effectiveness of the corrective action taken in order to maintain DEKRA's verification.

Opportunity (for improvement) – possible improvement in the EMS based on auditor observations. There is no obligation for action in response, to these observations.

2H Appeals

The NBP provides an appeals process for biosolids organizations and interested parties that disagree with the findings of a third-party EMS audit. The verification appeals process involves an Appeals Board, representing a balance of biosolids management interested parties, including an environmental advocacy group and wastewater industry professionals. An appeal must be submitted within 30 days of the official verification decision or interim audit decision by the Audit Company. Information about the appeals process is available from the NBP - contact Mr. Ned Beecher at ned.beecher@nebiosolids.org.

An appeal process is available to persons concerned about the methods and/or scope of this audit. Further information about this appeal process can be obtained from DEKRA (contact Pierre Salle, at pierre.salle@dekra.com or Jon Shaver at jon.shaver@dekra.com) or by contacting NBP.

2I Additional Information

Further information about this audit and/or the National Biosolids Partnership BMP can be obtained from City of Raleigh Public Utilities Department by contacting Ms. Marti Gibson at Marti.Gibson@raleighnc.gov.

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

3 SUMMARY OF AUDIT RESULTS

3A Verification Conclusion

Based on results of this audit, DEKRA issues the following Verification Statement concerning CORPUD's biosolids management system.

"DEKRA Certification, Inc. has independently verified that the biosolids management program being used by City of Raleigh Public Utilities Department supports continual improvement in environmental performance, meeting regulatory compliance obligations, utilizing good management practices and creating meaningful opportunities for public participation, and is in conformance with requirements of the National Biosolids Partnership Biosolids Management Program."

3B Strengths Observed

During this audit, DEKRA noted the following strengths in the CORPUD biosolids management system.

- The engagement of multiple persons and departments in the CORPUD EMS is evident and continuing to improve.
- The EMS is generating sustainable positive performance outcomes.

3C Audit Findings – Nonconformances

- a) The following minor nonconformance identified during the previous DEKRA audit is not yet fully corrected. The corrective action is still in progress and the nonconformance remains open as a minor nonconformance.

Minor Nonconformance JS 12-01 / 3 The CORPUD BMS (glossary) states that "process control points" include those where quality can be controlled.

The list identifying critical control points & operational controls within the CORPUD biosolids management program does not specifically reference Biosolids Quality requirements.

- b) Two minor nonconformances found during the current audit are described below.

Minor Nonconformance JS 13-01/8 NBP BMP Element 8 requires the organization to establish and maintain training to ensure employees are competent in performing their assigned biosolids tasks and duties and to maintain records of individual employee training delivered and completed.

Competency and training records are not available for some persons in Maintenance and Pretreatment.

Minor Nonconformance JS 13-02/16 NBP BMP Element 16 requires the organization to establish and maintain an internal audit program.

Although some internal audits are being conducted, a program for conducting these audits has not been developed for 2013.

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

3D Plans For Closure of Nonconformances

CORPUD will develop corrective action plans to address each of the above nonconformances and will submit these to DEKRA's Lead Auditor for approval. CORPUD will take timely action to implement the approved plan. DEKRA will review the effectiveness of the completed corrective action during the next third party audit.

3E Closed Nonconformances from Prior DEKRA Audits

Two nonconformances remained open from DEKRA's Verification Audit in 2012. CORPUD took corrective actions for these nonconformances as described below.

Minor Nonconformance JS 12-02 / 5 NBP EMS Element 5 requires that biosolids goals and objectives for improvement be set for each NBP outcome area. Although some objectives in place for 2012 have a regulatory component, there are no biosolids goals or objectives that specifically relate to improving regulatory compliance.

Corrective Action: CORPUD determined this nonconformance was caused by a management error. In response, CORPUD discussed the omission at an EMS Team meeting and developed an objective and action plan to maintain 100% compliance with applicable legal requirements. DEKRA's Lead Auditor reviewed the completed action and determined that this corrective action has been effectively implemented. The nonconformance is now closed.

Minor Nonconformance JS 12-03 / 5 NBP EMS Element 5 requires biosolids program goals and objectives to be specific and measureable. At least five of 17 objectives in place for 2012 are not measureable, except generally (e.g. develop outreach program, control fine particulate emissions, evaluate bagging).

Corrective Action: CORPUD determined this nonconformance was caused by a management error. In response, CORPUD discussed the omission at an EMS Team meeting and developed measurable targets to use in monitoring performance in achieving each objective for 2013. DEKRA's Lead Auditor reviewed the completed action and determined that this corrective action has been effectively implemented. The nonconformance is now closed.

3F Agreements

CORPUD and DEKRA have developed an Audits Program to cover interim audits of the CORPUD BMP during the four years between verification and reverification audits. It was agreed that DEKRA would conduct these interim audits to verify that CORPUD's biosolids management program is functioning effectively and continues to conform with NBP expectations and requirements. DEKRA will conduct interim audit #2-2 in January 2014. A Reverification Audit is due in 2017.

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

4 DETAILED AUDIT RESULTS

The following outlines results of DEKRA's audit of each process used within the CORPUD biosolids management program and the level of conformance of the process with applicable requirements of the NBP BMP Elements.

4A Outcomes

The CORPUD biosolids program is improving through the use of a systematic approach to managing its biosolids program. The following improvement outcomes within the past two years were confirmed.

Environmental Performance

Wetlands added to the site have helped reduce nitrogen emissions by more than 600 lbs in the past 2 months (equivalent to \$72,000/year).

CORPUD purchased more than 2000 lbs of nitrogen discharge permits, thus removing them from drinking water sources.

Quality Practices

Continuing improvement in personnel involvement has resulted in better department to department communication.

Product consistency has improved. No complaints about Class A quality have been received in over a year, compared to 4 - 5 per year prior to 2012.

Regulatory Compliance

A new sign-off procedure has eliminated the possibility of releasing Class A batches that do not meet compliance requirements.

Trust / confidence has been regained with NCDENR, as demonstrated by the draft permit to allow biosolids application on NRWWTP site.

Interested Party Relations

Relations with Neuse Riverkeeper continue to improve. The Riverkeeper supported the permit application for land applying biosolids at the NRWWTP site.

Review of interested party information identified an additional 900 persons for biosolids program communication.

4B Management System Dynamics

Significant Changes

CORPUD has implemented the following changes in the past year affecting their biosolids program:

- Two blowers have been replaced and two additional blowers have been installed

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

- The NPDES permit has been modified to allow increased nitrogen in effluent (+ biosolids applied to land at the site).
- The list of "interested parties" has been expanded to include additional neighboring citizens.

DEKRA reviewed these changes and conducted transaction tests to verify that these changes were implemented in a manner that is consistent with the CORPUD EMS and with NBP expectations.

EMS Changes, Including Documentation

CORPUD have not changed their Environmental Management System or its documentation in the past year and the documentation continues to meet NBP requirements. CORPUD intends to expand the use of a management system approach to additional operations in the immediate future and is planning for conformance with ISO-14001 and OHSAS-18001 requirements.

External Communications and Outreach

CORPUD involved interested parties in its biosolids program through proactive external communication, including stakeholder meetings, customer appreciation day and timely response to inquiries. Two interested parties interviewed during the audit confirmed the communication channels are in place and that CORPUD is responsive.

Effectiveness Review - Goals and Objectives Process

CORPUD achieved eleven of fifteen objectives for improving the performance of its biosolids program in 2012. Objectives were updated for 2013. The goals and objectives process was found to be functioning effectively.

Effectiveness Review - Corrective and Preventive Action Process

CORPUD used its corrective and preventive action process to effectively correct two nonconformances found during DEKRA's third party audit in 2012 and to plan the correction of findings from its internal audit in January 2013.

Effectiveness Review - Management Reviews

The CORPUD EMS Team and Management Team reviewed the performance of its biosolids environmental management system in February 2013. The review was found to be effective in generating improvement recommendations.

Interim Audits Program

The program for conducting interim audits of the CORPUD EMS was reviewed. The Collection Systems operation will be added as a separate process audit. Otherwise no changes are necessary.

Review of Trademarks and Seals

DEKRA's Lead Auditor reviewed CORPUD's use of the NBP Certificate and DEKRA's trademarks. There were no issues.

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

4C Process Audits

As part of this audit DEKRA audited the following processes that CORPUD uses within its biosolids management program and determined the level of conformance of each process with NBP expectations and requirements of the audit criteria.

Process	Conformance with NBP BMP Elements
Biosolids Use – Land Application (at Edwards Farm, Wake County)	Conforms
Competency, Awareness & Training	Conforms, with 1 minor exception
Compliance (with legal & other requirements)	Conforms
Control of Contractors	Conforms
Corrective and Preventive Action	Conforms
Critical Control Points & Operational Controls (identification)	Conforms
Goals & Objectives (for improvement)	Conforms
Internal Audits	Conforms, with 1 minor exception
Pretreatment	Conforms
Management Involvement (incl policy, planning, mgmt review)	Conforms

4D Audit Findings

The above processes were found to be consistent with NBP expectations and meet requirements of the NBP BMP Elements, except as noted in section 3 of this report.

4E Opportunities for Improvement

DEKRA's Lead Auditor offered the following suggestions for improving the CORPUD EMS. CORPUD has no obligation to take any action in response to these opportunities.

- The link between CORPUD strategic goals and objectives and biosolids goals and objectives could be more apparent.
- Consider reviewing contractor operating procedures and distance to groundwater for biosolids land application.
- Training records could be more readily accessible demonstrating completion of required training
- The internal audit process could be expanded to include assessment of specific needs identified by area managers, site inspections and compliance audits, as well as assessing program performance per an internal audit program.

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

- The use of the Corrective / Preventive Action process (and records) could be expanded to include incident / accident investigations, safety and environmental incidents, repeating operations / maintenance problems as a way of preventing these problems from re-occurring.
- Consider using a Supplier / Contractor Corrective Action Request (SCAR) for correcting suppliers and contractor errors.
- Consider making management review a process using reviews at different levels for different performance criteria and improvement recommendations.
- Consider having management reviews focus on improvement recommendations based on performance results.

Biosolids Management Program Interim Audit Report

City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

APPENDICES

Appendix 1 List of Participants

The following persons participated in this audit. Other persons provided additional explanations, as necessary.

CORPUD Personnel

John Carman	Director
Johnny Chavis	Process Control / Training Office
Darrell Crews	Laboratory Supervisor
Marla Dalton	Environmental Reuse Coordinator
Winslow Davis	Operations Supervisor
Glenn Evans	Plant Maintenance Supervisor
Ryan Faw	Industrial Pretreatment Coordinator
John Gibson	Facility Manager NRWWTP
Marti Gibson	EMS Coordinator
Tim Keene	Remote facilities Supervisor
Jesse Luper	Assistant Reuse Superintendent
Dale McGowan	Process Control / Training Office
Jason Waters	Land Mgmt Supervisor
T.J. Lynch	Assistant Public Utilities Director
Tim Woody	Reuse Superintendent

Contractor Personnel

Jason Smith	Granville Farms
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Interested Parties

Mr. Gary Edgington	Neighbor
Mr. Matt Fleahman	North Carolina Department of Water Quality

Biosolids Management Program Interim Audit Report
City of Raleigh Public Utilities Department, Raleigh, North Carolina

Audit Dates: February 20 to 22, 2013

Appendix 2 Documentation / Objective Evidence Reviewed

CAPA records (various)
Contractor inspection reports (various)
Corrective Action Plans and reports (various)
Customer Appreciation day presentation 1/24/13
DOPs (various)
EMS Goals and Objectives (+ action plans) 2013, 2012
Granville Farms response to corrective action request 1/20/12
Inspection checklist 11/15/12
Inspection of Always Trucking 2/21/13
Internal audit report January 22-25, 2013
List of critical control points and operational controls
Maintenance work orders (various)
Management of Change 7/11/12
Management Review minutes 2/7/13
McGill response to corrective action request 12/14/10
Monthly Performance Report FY13
MSDS (various)
NCDENR audit report 10/7/11
Pretreatment compliance audit NCDENR 10/7/11
Progress to ISO-14001 (chart)
Root Cause Analysis - Papa Johns
Site inspection 12-14-12
Sludge Discharge Prevention Control Program 10/7/10
Strategic Goals and Objectives
Training records (various)

END OF REPORT