



**National Biosolids Partnership  
Biosolids Management Program Interim Audit Report**

**Camden County Municipal Utility Authority  
Camden, NJ**

Audit Dates: September 6 & 7, 2012, with follow-up December 7, 2012

Audit Conducted By: DEKRA Certification, Inc. (Chalfont, PA)

Audit Team: Mr. Jon Shaver, Certified Biosolids EMS Lead Auditor / Biosolids Auditor

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Report Date: January 3, 2012

Reviewed By: Mr. Andy Kricun, Executive Director CCMUA (December 9, 2012)

Approved By: Mr. Pierre Salle, Managing Director - DEKRA Certification, Inc. (January 3, 2013)

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## 1. EXECUTIVE SUMMARY

DEKRA Certification, Inc. (DEKRA) conducted an independent third party audit of the biosolids environmental management system (EMS) being used by the Camden County Municipal Utility Authority (CCMUA) in managing its biosolids program. At CCMUA's request, DEKRA conducted the audit September 6 and 7, 2012 with a follow-up on December 7, 2012. This was interim audit #2 following DEKRA's Verification of the CCMUA biosolids management system in September 2010.

### Audit Purposes

This interim audit was conducted to:

- Confirm that the CCMUA biosolids management program is functioning effectively, with practices and procedures being performed as documented.
- Verify that the biosolids management program being used by CCMUA meets National Biosolids Partnership (NBP) expectations and conforms with requirements of the NBP BMP Elements.
- Examine outcomes CCMUA is achieving by using a systematic approach for managing its biosolids program.
- Verify that effective corrective action has been taken in response to open nonconformances from previous third party audits.

### Summary of Audit Activities and Results

DEKRA reviewed the dynamics of CCMUA's biosolids program and audited parts of that program for conformance with expectations and requirements of the NBP Biosolids Management Program Elements (audit criteria). The audit scope was consistent with NBP requirements and the interim audits program agreed by CCMUA and DEKRA.

Two major nonconformances and three minor nonconformances with respect to the audit criteria were found during this audit in September. In response, CCMUA took corrective action and a follow-up review by DEKRA's Lead Auditor confirmed that the two major nonconformances and one minor nonconformance were effectively corrected. Two minor nonconformances remain open and CCMUA has developed corrective action plans to address those nonconformances. The Corrective Action Plans have been approved by DEKRA's Lead Auditor. During the next Third Party Audit, DEKRA will review the effectiveness of the completed corrective actions.

### Audit Conclusions

The audit determined that:

- The CCMUA biosolids management program is functioning effectively and generating positive outcomes.
- The program meets NBP expectations and requirements of the NBP EMS Elements, with minor exceptions.
- All nonconformances from prior DEKRA audits have been effectively corrected.

Based on results of this audit, DEKRA verifies that the CCMUA biosolids management program meets NBP expectations and requirements. We recommend continuing certification within NBP Biosolids Management Program.

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## **2. AUDIT DETAILS**

### **2A. Local Agency Details**

Agency Name: Camden County Municipal Utility Authority (referred to as CCMUA in this report)

Facility: Delaware #1 Wastewater Treatment Facility, Camden NJ

Number of Employees (approximate) = 135

Volume of Wastewater Treated (approximate): = average 80 MGD

Tons of Dewatered Sludge Produced (approximate): approx 160 wet tons per day

#### Contractors Participating in Audit

Synagro Inc.

#### CCMUA Biosolids Program

CCMUA's Biosolids Program includes defined processes for Pretreatment, Wastewater Treatment, Solids Dewatering, Biosolids Storage and Transportation and Biosolids Use, including incineration, and landfill. CCMUA manages their biosolids program using a management system approach based on the NBP EMS Elements. CCMUA's primary goals for their biosolids management system, as stated in their EMS Manual, are to:

- Optimize water quality
- Optimize odor control performance
- Minimize costs

### **2B. Audit Team**

CCMUA authorized DEKRA Certification Inc. to conduct this Third Party Audit of their biosolids program. DEKRA is an accredited Third party Audit Company within the NBP Biosolids Management Program. Mr. Jon Shaver led the audit on behalf of DEKRA. Mr. Shaver is certified by NBP as a Biosolids EMS Lead Auditor and Biosolids Auditor. DEKRA and the auditor assigned to this audit have an independent relationship with CCMUA that meets NBP criteria for Third Party Auditors.

### **2C. Audit Phases**

The initial interim audit was conducted September 6 and 7, 2012. A follow-up audit was conducted on December 7, 2012 to verify effective correction of major nonconformances and minor nonconformances found during the initial audit (see Management System Dynamics discussion).

### **2D. Audit Scope and Locations**

DEKRA conducted this audit at the Delaware #1 Wastewater Treatment Plant in Camden NJ. No offsite locations were audited during this interim audit. One contractor (Synagro) participated.

The scope of the audit included parts of the CCMUA biosolids program, with special attention to practices and management activities that directly support biosolids-related operations, processes

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and activities. The audit included the following, consistent with NBP requirements and the Scope of Work agreed by CCMUA and DEKRA.

1. Management System Dynamics
  - Management of Significant Changes
  - Biosolids Policy Commitments
  - Effectiveness Reviews:
    - Management Review Process
    - Corrective & Preventive Action Process
    - Goals & Objectives Process
  - Examination of outcomes being achieved in the areas of regulatory compliance, interested party relations, environmental performance and quality practices.
2. Process Audits
  - Competency, Awareness & Training
  - Emergency Preparedness
  - Maintenance
  - Biosolids Preparation – Drying
  - Biosolids Use – Cement Kiln
3. Verification of effective correction of open nonconformances from previous Third Party audits (Sept 2011)
4. Interested party interviews

## **2E. Audit Methodology**

The audit was conducted by qualified auditors following guidelines stated in the NBP Auditor Guidance (August 2011). The auditor observed practices in place, interviewed key persons and reviewed pertinent documents and records using sampling techniques to assess the systematic performance of the process being audited and the consistency of biosolids management practices with written procedures. Interested parties were interviewed and transaction tests were performed to verify the effectiveness of the management system. This audit is not a verification of compliance with any legal requirements applicable to biosolids practices performed by the agency or its contractors.

## **2F. Definitions of Audit Findings & Required Corrective Action**

Major Nonconformance – a serious omission from requirements and/or other departure that represents, or could cause, a systemic failure, or the existence of multiple related minor nonconformances, or failure to effectively correct a nonconformance in a timely manner. For verification to continue, major nonconformances must be corrected and verified by third party audit within 90 days.

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Minor Nonconformance – an isolated departure from requirements that does not represent a systemic failure. Minor nonconformances require timely and effective correction by the agency and verification by the third party auditor during the next third party audit.

Opportunity (for improvement) – possible improvement in the management system based on audit observations. There is no obligation for action in response to these observations.

## **2G. Reference Materials**

The following documents were used as references during this audit:

- CCMUA EMS Manual (March 2010, updated August 2011)
- 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

## **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 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 date of this audit report. Further information is available by contacting the National Biosolids Partnership staff, Mr. Jim Cox by e-mail at [jcox@wef.org](mailto:jcox@wef.org).

An appeal process is available to persons concerned about the methods and/or scope of this audit. Further information can be obtained from DEKRA (contact Pierre Salle, [pierre.salle@dekra.com](mailto:pierre.salle@dekra.com) or Jon Shaver, [jon.shaver@dekra.com](mailto:jon.shaver@dekra.com)) or from NBP (contact Jim Cox, [jcox@wef.org](mailto:jcox@wef.org)).

## **2I. Additional Information**

Further information about this audit and/or the National Biosolids Partnership Biosolids Management Program can be obtained from Camden County Municipal Utility Authority. Contact Mr. Andy Kricun (e-mail: [andy@ccmua.org](mailto:andy@ccmua.org) ).

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### **3. SUMMARY OF AUDIT RESULTS**

#### **3A. Verification Conclusion**

Based on results of this audit, DEKRA has verified that the CCMUA biosolids management system is functioning effectively and continues to meet expectations and requirements of the National Biosolids Partnership Biosolids Management Program, with minor exceptions. DEKRA's Verification of the biosolids management system will continue for 12 months from the date of this audit. We recommend continuing certification within the NBP Biosolids Management Program.

#### **3B. Strengths Observed**

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

- The oil analysis practice being done regularly at the plant is an excellent example of using predictive maintenance.

#### **3C. Audit Findings – Nonconformances Remaining Open**

The following minor nonconformances were identified during the audit. CCMUA has prepared corrective action plans for each nonconformance and those plans have been approved by the Lead Auditor.

Minor Nonconformance JS 12-02/ 11 NBP EMS Element 11 requires the organization to require contractors to establish and maintain emergency preparedness and response plans and procedures. Emergency plans being used by Synagro for their operation in the wastewater plant have not been coordinated with CCMUA Emergency Plans in the plant.

Corrective Action: CCMUA determined that this nonconformance was caused by a communication problem regarding contractor expectations. In response, Synagro's written emergency plan for their operation at the plant have been merged into the CCMUA emergency plans. However CCMUA approval of the Synagro plan has not officially occurred and an exercise / drill verifying the effectiveness of the plan has not been conducted. This nonconformance remains open.

Minor Nonconformance JS 12-04/ 16 NBP EMS Element 16 requires the organization to establish an internal audit program to determine whether it is effectively meeting its biosolids management policy and that the internal audit program cover biosolids management activities performed by contractors. While a review of documentation has been completed, CCMUA has not conducted an onsite assessment of the use of their biosolids and consistency with their Biosolids Policy at the Lehigh Cement facility.

Corrective Action: CCMUA determined that this nonconformance was caused by a misunderstanding regarding contractor requirements. They corrected the immediate problem by reviewing the subcontractor (Lehigh Valley Cement) performance with the primary contractor (Synagro) and verified that Synagro had conducted an effective review of their subcontractor. They also expanded EMS internal audit requirements to ensure that CCMUA periodically review the performance of all contractors and subcontractors where CCMUA biosolids are used or



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handled. Evidence of completion of this action was reviewed and the Lead Auditor determined that actions taken have partially corrected the problem, however a review of conformance with Biosolids Policy and some other EMS requirements directly by CCMUA has not yet occurred. This nonconformance remains open.

CCMUA has prepared corrective action plans for each nonconformance remaining open from this audit. DEKRA's Lead Auditor has reviewed and approved those corrective action plans. The effectiveness of corrective actions taken will be reviewed during the next Third Party Audit, currently planned to occur in September 2013.

### **3D. Audit Findings – Nonconformances Closed**

During the initial onsite audit (September 6 & 7, 2011) DEKRA found nonconformances in the CCMUA management system that required correction. As a result, CCMUA took corrective action and DEKRA reviewed the effectiveness of that corrective action on December 7, 2012. The results of that review are described below.

Major Nonconformance JS 12-01/ 8 NBP EMS Element 8 requires the organization to ensure employees responsible for specific biosolids management activities are competent, including training in general awareness of the BMP and how each employee's assigned roles and responsibilities relate to the biosolids value chain. Synagro personnel operating dryer equipment at the plant have not received training in general BMP awareness or how the CCMUA EMS affects them.

Corrective Action: CCMUA determined that this nonconformance was caused by incomplete training. As a result they corrected the problem by conducting EMS Awareness training for all Synagro personnel working onsite. They further corrected the cause of this problem by expanding EMS requirements to ensure that personnel working on behalf of CCMUA are properly trained, including EMS roles and responsibilities. Evidence of completion of this action was reviewed and the Lead Auditor determined that actions taken have effectively corrected the problem and addressed the cause. This nonconformance is now closed.

Minor Nonconformance JS 12-03/ 14 NBP EMS Element 14 requires that formal corrective action plans be established to address the findings of internal BMP audits. There is no link to the Corrective and Preventive Action process for some findings from the August 2012 internal audit.

Corrective Action: CCMUA determined that this nonconformance was caused by not following their Corrective and Preventive Action procedure. In response they prepared corrective action plans for each nonconformance from the August internal audit, revised the procedure to clarify the need for action in response to internal audit findings and retrained internal auditors to ensure they understand the procedure. Evidence of completion of this action was reviewed and the Lead Auditor determined that actions taken have effectively corrected the problem and addressed the cause. This nonconformance is now closed.

Major Nonconformance JS 12-05/ 17 NBP EMS Element 17 requires that management review the BMP and its performance at intervals that it determines appropriate and CCMUA has stated that these reviews would be annual. CCMUA has not conducted a Management Review of their EMS performance in more than a year.



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Corrective Action: CCMUA determined that this nonconformance was caused by a management error. They corrected the immediate problem by conducting a management review of EMS performance. They further corrected the cause of this problem by delegating EMS responsibilities, including scheduling of management reviews, to 2 CCMUA employees. Evidence of completion of this action was reviewed and the Lead Auditor determined that actions taken have effectively corrected the problem and addressed the cause. This nonconformance is now closed.

### **3E. Opportunities for Improvement**

The following opportunities for improvement in the CCMUA biosolids program were noted during the audit.

- A "management of change" procedure could help in planning significant changes and ensuring system requirements are completed before starting these changes.
- Planning for a significant change, such as adding a new use for biosolids (cement kiln fuel), could trigger review / update of critical control points and need for operational controls.
- Internal audit reports could note the purpose and scope of the audit and summarize the results as they relate to the purpose.
- The CCMUA EMS Manual could be organized more systemically, with less complex wording (say what you do, then match NBP Elements to that).
- The EMS Manual could include a section / procedure for controlling contractors.
- With the focus on sustainability and reduced energy consumption, CCMUA could consider seeking certification to ISO-50001:2011 and MSE-50021:2012.

### **3F. Agreements / Next Steps**

CCMUA will take action to correct each nonconformance found during this audit. Review of action taken will occur during the next Third party Audit.

The next Interim Audit will be a Third Party Audit conducted in September 2013. CCMUA will make arrangements with DEKRA.

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#### **4. MANAGEMENT SYSTEM DYNAMICS**

Review of the management system dynamics and outcomes is intended to verify that the biosolids management system is functioning effectively and generating positive outcomes (results) and that changes are being incorporated into the system. The following summarizes DEKRA's review of the dynamics of the CCMUA biosolids management system.

##### **4A Significant Changes**

The following significant changes have occurred, or are underway, at CCMUA affecting their critical control points and biosolids EMS:

1. Biosolids drying equipment has been installed however has not yet been commisioned due to operating throughput limitations.
2. The onsite biosolids dryer process is being operated solely by Synagro.
3. Truck loading and transportation has been contracted to Synagro.
4. Use of Class A dried biosolids at a cement kiln in Maryland has begun (in May 2012).
5. A CCMUA "Sustainability Coordinator has been appointed

Transaction tests on each of these changes as par of this audit determined that they have been implemented in a manner that is consistent with CCMUA Biosolids Policy and EMS requirements.

##### **4B Management System and Documentation Revisions**

Major changes to the EMS Manual, top-level documentation and major processes within the biosolids management system were reviewed. There were no structurally significant revisions. The manual continues to follow the NBP EMS Elements sequentially.

##### **4C Examination of Outcomes**

The CCMUA biosolids program is improving using their management system. The following outcomes within the past two years were confirmed.

###### Environmental Performance

1.8 megawatts of green energy solar panels has been added resulting in 10% overall reduction in external power consumption.

A new biofilter has been installed for odor control, eliminating the need for chemical based filters

Natural gas engines have been replaced by electric engines, lowering CO2 emission.

###### Biosolids Quality

Class A biosolids are now produced approximately 95% of the time (compare 5% in 2011)

###### Regulatory Compliance

CCMUA received an Environmental Stewardship Award from NJDEP for taking action "above and beyond compliance" (e.g. green energy)

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Interested Party Relations

Odor complaints from neighborhood have reduced from approximately 30 per year to 4 this year to date.

The number of "rain gardens" that CCMUA is building / sponsoring in Camden has increased to 20 (from 11 in 2011). Public reaction continues very positive.

**4D Biosolids Policy Commitments**

The CCMUA Biosolids Management Policy remains as approved in 2009. The Policy includes a commitment to follow the principles of the NBP Code of Good Practice. During this Interim Audit, DEKRA's Lead Auditor reviewed performance of CCMUA biosolids program and found biosolids activities to be consistent with commitments made in the Policy and the principles of NBP's Code of Good Practice.

**4E Effectiveness Reviews**

Biosolids Goals & Objectives

Five of six objectives for 2011 were achieved and satisfactory progress is being made for the other. Objectives and action plans have been updated for 2012.

Communications Program

A strong, proactive Communications Program continues, with good interaction and response with interested parties, particularly members of the public and local community groups. CCMUA continues their involvement with the "Green Infrastructure Program" with local stakeholders.

Corrective and Preventive Action Process

CCMUA uses its Corrective and Preventive Action Process to investigate and correct management system nonconformances, most of which are identified by internal and Third Party audits. Major nonconformances and minor nonconformances found during DEKRA's audits in 2010 and 2011 were effectively corrected in a timely manner.

Management Reviews

Reviews of ongoing biosolids activities are conducted weekly to plan activities and address any concerns, particularly about effluent quality and odors. An annual report is issued to employees and the public.

Audit Conclusion - Effectiveness Reviews

The above processes were found to be functioning effectively, with the following exceptions:

Minor Nonconformance JS 12-03/ 14 NBP EMS Element 14 requires that formal corrective action plans be established to address the findings of internal BMP audits. There is no link to the Corrective and Preventive Action process for some findings from the August 2012 internal audit.

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#### **4F Closed Nonconformances From Previous Third Party Audits**

Corrective action taken in response to nonconformances from KEMA's Verification Audit of the CCMUA Biosolids Management System in May 2010 and the status of those nonconformances are summarized below.

Minor Nonconformance JS 11-05      NBP EMS Element #14 requires documenting formal corrective action plans and tracking progress in completing these plans. Tracking of progress in completing corrective actions in response to nonconformances occurs informally in weekly meetings, however results are not recorded.

*Corrective Action – CCMUA determined that this nonconformance was caused by incomplete understanding of the need to record tracking of corrective actions. In response, CCMUA revised its CAPA procedure to include a method of tracking completion of action plans and closure of audit nonconformances. This nonconformance is now closed.*

Minor Nonconformance JS 11-07      NBP EMS Element #5 requires that action plans be established for activities to achieve biosolids goals and objectives. While action plans are understood and communicated, they have do not always clearly designate schedules, milestones, resources, and responsibilities.

*Corrective Action – CCMUA determined that this nonconformance was caused by incomplete action plans for objectives. In response, CCMUA added action steps, milestones and responsibilities for action plans to achieve objectives. This nonconformance is now closed.*

#### **4G Interested Party Interviews**

During this audit, DEKRA interviewed a representative of the New Jersey Department of Environmental Protection (NJDEP) who is familiar with the design, installation and operation of the dryer equipment at the CCMUA plant. The representative stated that no noncompliances have occurred and air permits are being complied with. In addition, the representative noted that community outreach and public opinion have improved considerably over the past few years.

#### **4H Use of NBP Certification and DEKRA Verification**

Use of and references to NBP Certificate and DEKRA Verifications were reviewed. There were no concerns.

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**5. PROCESS AUDITS**

The following describes the results of DEKRA's audit of processes that CCMUA uses in managing biosolids activities. Consistent with NBP requirements, only parts of the management system are audited during interim audits, such that the entire management system and all 17 EMS Elements are covered at least once during the four annual interim audits between Verification Audits.

**5A Processes Audited**

**5a. Summary**

DEKRA audited the following processes that CCMUA uses in managing its biosolids program and determined the level of conformance of each process with NBP expectations and requirements of the audit criteria.

<b>Process</b>	<b>Conformance with Applicable BMP Elements</b>
Competency, Awareness & Training	Conforms
Emergency Preparedness	Conforms, with minor exception
Maintenance	Conforms
Biosolids Preparation – Drying	Conforms
Biosolids Use – Cement Kiln	Conforms
Internal Audits	Conforms

**5B Process Audit Results**

Audit of the above process found they are functioning effectively, meet NBP expectations and conform to applicable requirements of the NBP BMP Elements, with minor exceptions noted below:

Minor Nonconformance JS 12-02/ 11 NBP EMS Element 11 requires the organization to require contractors to establish and maintain emergency preparedness and response plans and procedures. Emergency plans being used by Synagro for their operation in the wastewater plant have not been coordinated with CCMUA Emergency Plans in the plant.

Minor Nonconformance JS 12-04/ 16 NBP EMS Element 16 requires the organization to establish an internal audit program to determine whether it is effectively meeting its biosolids management policy and that the internal audit program cover biosolids management activities performed by contractors. While a review of documentation has been completed, CCMUA has not conducted an onsite assessment of the use of their biosolids and consistency with their Biosolids Policy at the Lehigh Cement facility.

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**5b. Opportunities for Improvement**

The following “opportunities” for improving the CCMUA EMS were noted during the audit. Opportunities do not represent nonconformances and CCMUA has no obligation to take any action in response to them.

- A "management of change" procedure could help in planning significant changes and ensuring system requirements are completed before starting these changes.
- Planning for a significant change, such as adding a new use for biosolids (cement kiln fuel), could trigger review / update of critical control points and need for operational controls.
- Internal audit reports could note the purpose and scope of the audit and summarize the results as they relate to the purpose.
- The CCMUA EMS Manual could be organized more systemically, with less complex wording (say what you do, then match NBP Elements to that).
- The EMS Manual could include a section / procedure for controlling contractors.
- With the focus on sustainability and reduced energy consumption, CCMUA could consider seeking certification to ISO-50001:2011 and MSE-50021:2012.

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**APPENDICES**

**List of Participants**

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

CCMUA Personnel

Doug Burns	EMS Coordinator
Robert Cornforth	Director of Operations
Andy Kricun	Executive Director
Chris Waldon	Sustainability

Other

Janet Miles	DB/Guiarino Project Engineer
Oleg Zonis	DB/Guiarino Project Engineer
Ed Choromanski	Director – Air Quality, NJDEP
Alan Perry	Synagro - Dryer Operations Supervisor

**List of Documents & Records Reviewed**

Biosolids Policy	Oil analyses (various)
Biosolids Objectives – 2011 & 2012 (updated )	Synagro SOPs various
CCMUA biosolids goals & objectives (2011 & 2012)	CCMUA SOPs (various)Emergency plans
Biosolids EMS Performance Report 2011	Hazcom training
Internal audit report 8/21/2012	
CCMUA EMS Manual + various contents	
Critical control points table	
Corrective Action Plans + worksheet for third party audit nonconformances	

**END OF REPORT**