



Littleton/Englewood Wastewater Treatment Plant



Biosolids Performance Report - 2013

Biosolids Use – A Brief History

In 1977, Littleton/Englewood Wastewater Treatment Plant (L/E WWTP) began operation as a joint-venture effort of the Cities of Littleton and Englewood (Cities), serving the southwestern area of the Denver, CO metropolitan area. It soon became evident that the facility was more than just a wastewater treatment plant. It was also a solids treatment plant. In fact, early history of plant operation reveals that the solids handling systems at the plant were the most problematic systems impacting compliance with the discharge permit. A sludge management program was critical to the long-term successful operation of the facility.

The first sludge management plan struggled with ineffective solids handling systems. Anaerobic digesters provided solids treatment and vacuum filters were used for dewatering. Disposal of the resulting biosolids was handled via burial at a local landfill. Unfortunately, the landfill became an EPA Superfund clean-up site due to hazardous materials also being buried there.

The vacuum filter/landfill disposal practice was abandoned in the early 1980's. Liquid biosolids hauling (2 to 2½ percent solids) replaced the dewatering effort and application of biosolids to dryland wheat fields for beneficial use replaced landfill disposal. While many aspects of the entire biosolids management program have changed since then, beneficial use of biosolids through agricultural application has remained the cornerstone of the program.

Because of the landfill experience, the Cities recognized that data on the use of biosolids for dry-land agricultural application would be critical to the program's success. In 1982, a biosolids research program was initiated (with Colorado State University conducting the study) to meet these needs. The research has continued for thirty-two (32) consecutive years and is a significant benefit to managing biosolids programs. This information is valuable in evaluating the success of the program and answering questions from concerned citizens and farmers regarding the impacts of biosolids used for crop fertilization.



The Road to Platinum Certification

On July 5, 2011, L/E WWTP signed a Letter of Understanding with the National Biosolids Partnership (NBP) to develop and implement a Biosolids Management Program (BMP) that meets NBP requirements. Recognized by NBP, the L/E WWTP BMP supports excellence in biosolids management practices, augments regulatory compliance obligations, environmental performance and provides meaningful opportunities for public participation. On January 15, 2013, L/E WWTP was awarded Gold Level Recognition in the NBP as an *"organization which has completed an independent, third party BMP verification and has committed to conducting annual internal audits."*

December 4, 2013 marked the next significant milestone in the L/E WWTP BMP. Following a successful third-party audit, L/E WWTP received Platinum Certification from the NBP. As indicated by the NBP: *"Your program is viewed as a model by those water resource recovery facilities and other organizations following the EMS path. We are pleased to have Littleton Englewood Wastewater Treatment Plant as a part of this international program, demonstrating excellence and leadership in biosolids management."*



Biosolids Management Program Summary

January 1, 2013 to December 31, 2013

Through commitment to the National Biosolids Partnership (NBP) Code of Good Practice, the L/E WWTP Biosolids Management Program (BMP) improves continuously through the use of an Environmental Management System (EMS) approach. Utilizing four key outcomes promoted in a biosolids EMS, objectives are established to meet or exceed goals related to: Better Relations with Interested Parties, Environmental Performance, Regulatory Compliance and Quality Management Practices.

Summary of Monitoring Data, Goals and Objectives

Under these goals, fourteen (14) objectives were initially established for our 2012 BMP. Sixty percent (60%) of objectives were met (8 of 14) for 2013. Six of the objectives were not met (although progressing) as they are longer-term and planned for completion or re-evaluation by the end of 2014.

Better Relations With Interested Parties

Better relations, with interested parties, continue to improve. This is achieved through:

- Develop three (3) new ways to communicate proactively with interested parties that provide a means for input: *Objective met*
- Investigate and evaluate preservation for potentially historical structures on farm sites: *Objective met*
- Complete NBP achievement recognition: *Objective met*
- Develop or link to biosolids fact sheets for InfoNet and web site: *Objective met*

In addition to these objectives, open public meetings (i.e. Joint City Council meetings, public hearings and community interaction), provide for information transfer (and questions) to better

understand present and future regulatory and/or watershed direction. Collaborative affiliations with local, state and federal regulatory agencies; watershed interest groups and other interested parties, also result in programs which benefit the community, as well as the environment.

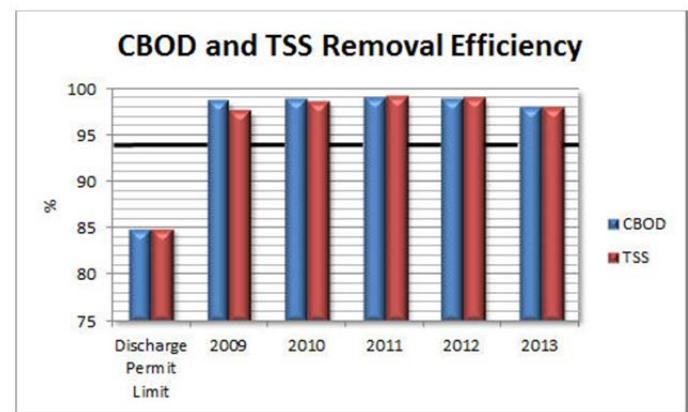
Environmental Performance*

* See Appendix A for all performance details

- Reduce fuel use for biosolids transport (8% by end of 2014) – *Progress: 4.0% reduction*
- Reduce electric energy requirements for treatment (2% by end of 2014) – *Progress: 0.5% reduction*

Regulatory Compliance*

- Comply with all biosolids regulations (10% below metals limitations) - *Objective met*
- Comply with CDPS discharge regulations (10% below discharge limitations) - *Objective met*



Quality Management Practices

- L/E WWTP beneficially reused all of the biosolids (100%) produced (3,123.4 dry metric tons or 3,443 tons) with no biosolids products sent to the landfill – *Objective met*
- Implement biosolids knowledge management program (complete 8 SOPs) – *Progress: 5 completed*
- Achieve voluntary biosolids certification for biosolids staff (100%) – *Objective met*

- Reduce biosolids O&M program operation costs (5% reduction) - *Objective met*
- Complete equipment PM tasks (95%) - *Objective met*
- Reduce treatment O&M costs (2% reduction) - *Objective met*
- Approve 2014/15 biosolids research project with CSU - *Objective met*
- Research alternate beneficial end uses for biosolids (end of 2014) – *Progress: continuing*
- Document NACWA Excellence in Management recognition – *Objective met*

L/E WWTP produces Class B biosolids with monitored metals concentrations at least 10% below the Pollutant Concentration (PC) ceiling concentrations for Class “B” biosolids, as documented in Table 2.1 of the Federal 503 Regulations for Biosolids. The Corrective and Preventive Action (CAPA) process is used to identify and address faults in the treatment system, as well as identify opportunities for improvement. In 2013, two (2) process incidents were identified with one being closed and an action plan developed to resolve the other. Other quality practices resulted in recognition through the 2013 NACWA *Excellence in Management Recognition Program (Gold Level)*.

Summary of Relevant Contractor Activities

No contractor activities occurred, related to the biosolids value chain, in 2013.

Summary of Actions That Have Been Taken on a Voluntary Basis

Below is a summary of actions taken on a voluntary basis in 2013:

- L/E WWTP biosolids were registered with Colorado Department of Agriculture as a soil amendment

- A continuing biosolids research program for 2014 was approved with Colorado State University
- Successfully completed our 2013 World Water Monitoring Challenge water education event
- NBP Advisory Committee member
- RMWEA Biosolids Committee members
- Completed RMWEA Supervisory Leadership course (Beneficial Use Supervisor)

Summary of 2013 Internal Audit

BMP Strengths Noted:

- Pride in workmanship, housekeeping and doing effective work is evident throughout the plant.
- Management is committed to establishing an effective biosolids management system and a strong teamwork approach is being used to do this, with input from several areas of the plant.
- Trend analysis is used to analyze several important parameters. Management understands the value of monitoring and measuring performance trends to initiate improvement and preventive action.
- An effective internal communications system is in place and several good methods for external communication are used.
- A well-developed SCADA system is in place to monitor and control operations at the plant. The ability to monitor the system from each process area and through internet and Smartphone access for off-site monitoring is an added benefit.

BMP Outcomes:

Quality Biosolids Practices

The L/E WWTP biosolids program has been in operation since 1982. The program has evolved in many ways, achieving regional and national recognition in the areas of biosolids program operation and

maintenance (O&M) and biosolids research. However, documented practices were limited and not fully developed. Overall, the program functions in compliance with established regulations/permits and is fully maintained and operated by plant staff. There is little or no contractor involvement.

Environmental Compliance

Biosolids application practices follow established guidelines at national, state and county levels. Programs to monitor and improve energy use and fuel conservation are being implemented. Energy optimization is being approached through a Process Efficiency program sponsored by XCEL Energy. Diesel fuel is used in biosolids program operation. Fuel conservation is being approached by evaluating technology/operating alternatives currently not being utilized (i.e. equipment aerodynamics, lubrication alternatives, evaluating driving habits, etc.) for implementation.

Relations with Interested Parties

The L/E WWTP has implemented various communication methods to improve their relations with interested parties. Several articles have been published, BMP information has been posted on the web site, follow-up surveys have been developed to solicit effectiveness of programs, and L/E WWTP representatives attended interested

For more information

If you have questions or concerns, or just want to provide comments, please feel free to contact us directly at:

Littleton/Englewood Wastewater Treatment Plant:

Phone: 303.762.2600

Emergencies: 303.435.4763

Office hours: 7:30 a.m. to 4:30 p.m. M - F

Or visit us on the web! www.lewwtp.org

party meetings and City Council meetings.

Summary of Independent Third Party Audit

Strengths Noted (from 2013 Platinum Certification audit: 11-23-13)

“During this audit, DEKRA noted the following strengths in the Littleton Englewood biosolids management program.

- Use of “process objectives” is effective for assessing and communicating performance.
- Housekeeping is excellent throughout the plant and especially in centrifuge dewatering areas.

Audit Findings – Nonconformances

Four minor nonconformances found during this audit remain open. LEWWTP has prepared Corrective Action Plans for each nonconformance and DEKRA’s Lead Auditor has approved those plans. DEKRA will verify the effective correction of each nonconformance during the next Third Party Audit.”



Treatment Division Manager



Appendix A

2013 Regulatory Compliance objective to demonstrate biosolids metals performance at least 10% below PC permit limit - based on TABLE 2-1 Pollutant Limits (503 Regs)				
Metal Analyzed	Ceiling Concentration Limit	Pollutant Concentration (PC) Limit	2013 Test Results	Actual Performance
	(ug/g)	(ug/g)	ug/g	% Below PC Limit
Arsenic	75	41	1.9	95.4
Cadmium	85	39	1.7	95.6
Chromium	3,000	1,200	22	98.2
Copper	4,300	1,500	701	53.3
Lead	840	300	19.3	93.6
Mercury	57	17	0.25	98.5
Molybdenum	75	na	13.4	82.1*
Nickel	420	420	14.5	96.5
Selenium	100	36	14.5	59.7
Zinc	7,500	2,800	861	69.3

* Mo performance based on ceiling concentration limit

2013 Regulatory Compliance objective to demonstrate facility discharge performance at least 10% below permit limit			
Effluent Parameter	Discharge Permit Limit	2013 Performance Results	Actual Performance
Effluent Parameter	mg/l	mg/l	% Below Limit
CBOD monthly	20	2.4	88.0
CBOD weekly	30	2.5	91.7
CBOD removal efficiency (%)	85	98.9	116.4
TSS monthly	30	2.0	93.3
TSS weekly	45	2.0	95.6
TSS removal efficiency (%)	85	98.1	115.4
NH ₃ monthly	6.9	1.8	73.9

2013 Improve Environmental Performance and Quality Management Practices					
Objective	Measure	2012	2013	Progress	
Reduce diesel fuel use by 8%	Gal/dry ton hauled	8.54	8.20	4.0%	reduction
Reduce treatment energy use by 2%	kwh/MGD	3,198	3,183	0.5%	reduction
Reduce biosolids program cost by 5%	\$/ton hauled	\$254	\$220	13.4%	met
Reduce treatment program cost by 2%	\$/1,000 gallons treated	\$1.82	\$1.59	12.5%	met