NATIONAL biosolids PARTNERSHIP

2014

YEAR IN REVIEW

Water Environment Federation®
the water quality people®

About WEF

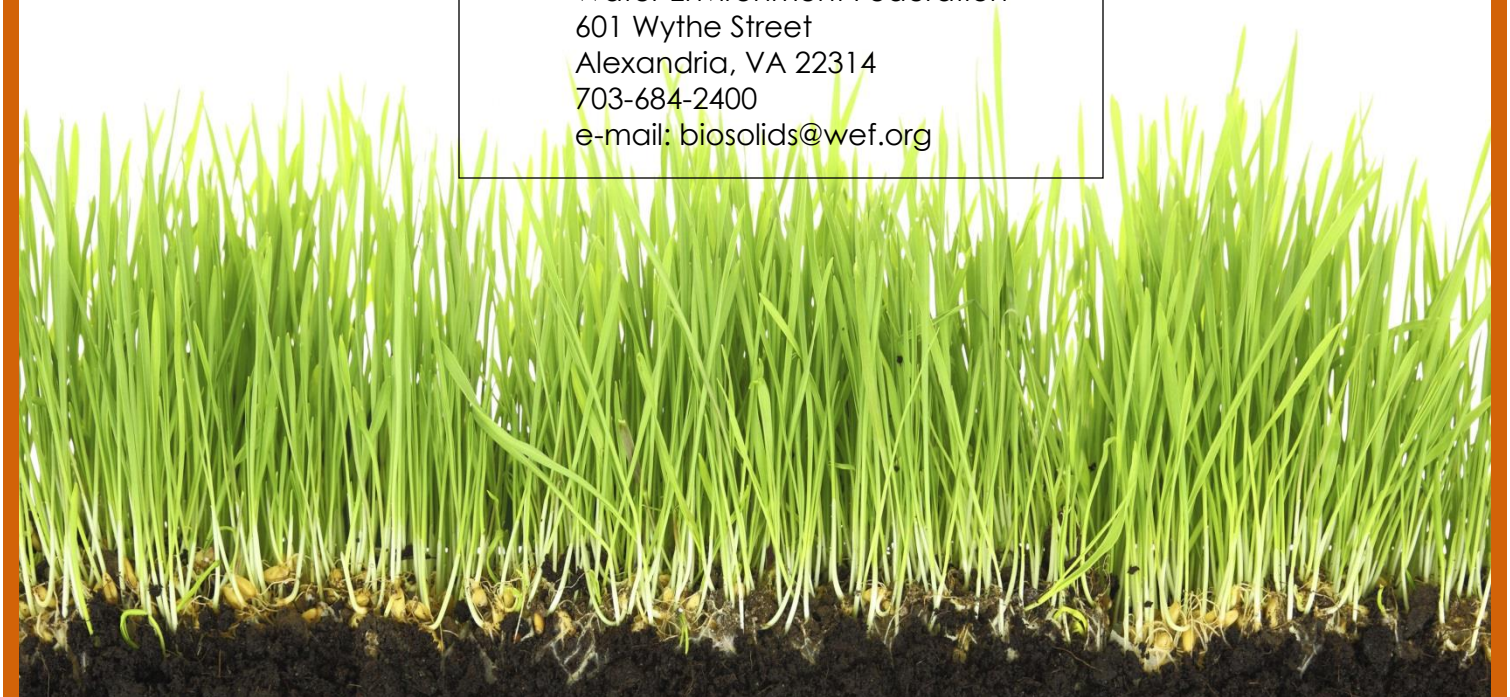
Founded in 1928, the Water Environment Federation (WEF) is a not-for-profit technical and educational organization of 36,000 individual members and 75 affiliated Member Associations representing water quality professionals around the world. WEF members, Member Associations, and staff proudly work to achieve our mission to provide bold leadership, champion innovation, connect water professionals, and leverage knowledge to support clean and safe water worldwide. To learn more, visit www.wef.org.

For information on membership, publications, and conferences, contact

Water Environment Federation
601 Wythe Street
Alexandria, VA 22314-1994 USA
703-684-2400
http://www.wef.org

For additional Biosolids information, please see biosolids.org.

CONTACT:
Water Environment Federation
601 Wythe Street
Alexandria, VA 22314
703-684-2400
e-mail: biosolids@wef.org



LETTER FROM THE CHAIR

For approximately 16 years, the Water Environment Federation (WEF) has operated the National Biosolids Partnership (NBP), which was originally a federally funded collaborative program with the National Association of Clean Water Agencies (NACWA) and the U.S. Environmental Protection Agency (U.S. EPA). In 2013, the NBP transitioned to a WEF program in collaboration with NACWA; U.S. EPA; the Water Environment Research Foundation; utility representatives; state; regional and international biosolids associations; and academia. The NBP remains dedicated to its core mission of championing organics management at the national level to enable municipal agencies and the broader biosolids management community to better anticipate and respond to emerging developments and issues, adopt and maintain effective management practices, and maximize the resource recovery opportunities presented by sustainably managing organics.

Because solids management provides an opportunity for renewable energy production and nutrient recovery, while representing a significant cost center for most water resource recovery facilities (WRRFs), it is critical that the NBP maintain and expand its leadership in this area as our industry expands its focus from providing wastewater treatment services only to recovering valuable resources. In support of this initiative, WEF continues to dedicate resources to drive innovation by promoting technologies and approaches that support broad application of renewable energy projects. In fact, the NBP released "Biogas Production and Use at Water Resource Recovery Facilities in the United States," which highlights existing anaerobic digestion systems at U.S. WRRFs, as well as current biogas utilization and opportunities at these facilities (refer to biogasdata.org). A report summarizing the second phase of biogas data collection is expected to be available in early January 2015. The NBP collaboration continues to address the many emerging regulatory and policy drivers and works with regulatory agencies to remove constraints on resource recovery opportunities, while promoting the emergence of a more supportive framework for resource recovery options. The NBP website (biosolids.org) continues to provide a solids information hub, which enables organic solids managers to quickly and credibly respond to questions and concerns by creating easy and timely access to critical technical information. I encourage you to further explore the unprecedented opportunities that exist and are emerging with regard to organics, energy, and nutrients in biosolids in the recently released publication "Enabling the Future: Advancing Resource Recovery from Biosolids."

In addition, the NBP continues to oversee a Biosolids Management Program (BMP) that is based on an environmental management system (EMS) anchored by a continuous improvement approach. This program provides certification and recognition to participating organizations that go beyond regulatory requirements and exhibit exemplary biosolids management practices. The 2013-2014 fiscal year has been an exciting and busy one for many of the participating NBP agencies. This report highlights key accomplishments from the NBP BMP certified organizations, which serve as wonderful models for continuous improvement in the areas of environmental performance, regulatory compliance, quality management practices, and interested party relations.

Sincerely,

Vince De Lange,
East Bay Municipal Utility District, CA
(Chair, NBP Advisory Committee)

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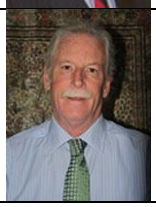
Chris Hornback, National Association of Clean Water Agencies		Jim Tallent, Littleton/Englewood, CO Wastewater Treatment Plant, Englewood, CO	
Ernie Kelley, Vermont Department of Environmental Conservation Watershed Management Division		Todd Williams, CH2M Hill	

CONTINUAL IMPROVEMENT

GREAT LEADERSHIP = Great Questions + Great Solutions

Great Questions provide for continual improvement

Great Solutions = INNOVATION

The NBP Biosolids Management Program (BMP) is a comprehensive management tool based on the principles of an Environmental Management System (similar to ISO 14001) requiring continuous improvement to develop, implement, and monitor environmentally sustainable practices. An NBP BMP helps Water Resource Recovery Facilities (WRRFs) and affiliated organizations ensure that they are efficient, responsive, and protective of human health and the environment. Organizations that have chosen to become certified by the NBP collectively manage more than 12% of the biosolids in the United States. These organizations have documented significant benefits in using the program's tools to reduce operating costs and achieve greater efficiencies while protecting public health and managing residuals in an environmentally beneficial and cost-effective manner. Because the NBP BMP requires continual improvement, those organizations that are NBP BMP Certified and Recognized, represent the best-of-the-best and are leaders and innovators in biosolids management. All of the NBP BMP organizations adhere to the NBP Code of Good Practice, which is highlighted below.

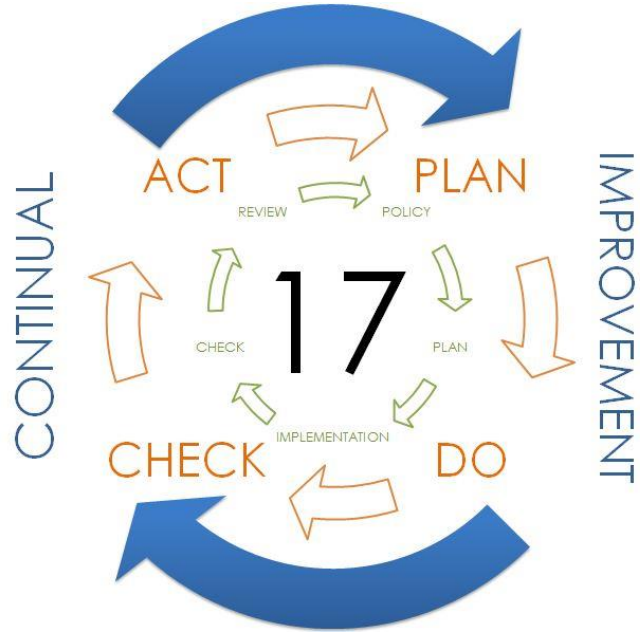
CODE of GOOD PRACTICE

This is a broad framework of goals and commitments to guide the production, management, transportation, storage, and use or disposal of biosolids. Those who embrace the Code and participate in the National Biosolids Partnership (NBP) commit to "do the right thing." Participants pledge to uphold the following principles of conduct outlined in the Code:

- COMPLIANCE
  To commit to compliance with all applicable federal, state, and local requirements regarding production at the wastewater treatment facility, and management, transportation, storage, and use or disposal of biosolids away from the facility.
- PRODUCT
  To provide biosolids that meet the applicable standards for their intended use or disposal.
- NBP BIOSOLIDS MANAGEMENT PROGRAM
  To develop a Biosolids Management Program that includes a method of independent third-party verification to ensure effective ongoing biosolids management.
- QUALITY MONITORING
  To enhance the monitoring of biosolids production and management practices.
- QUALITY PRACTICES
  To require good housekeeping practices for biosolids production, processing, transport, and storage, and during final use or disposal operations.
- CONTINGENCY AND EMERGENCY RESPONSE PLANS
  To develop response plans for unanticipated events such as inclement weather, spills, and equipment malfunctions.
- SUSTAINABLE MANAGEMENT PRACTICES AND OPERATIONS
  To enhance the environment by committing to sustainable, environmentally acceptable biosolids management practices and operations through a Biosolids Management Program.
- PREVENTIVE MAINTENANCE
  To prepare and implement a plan for preventive maintenance for equipment used to manage biosolids and wastewater solids.
- CONTINUAL IMPROVEMENT
  To seek continual improvement in all aspects of biosolids management.
- COMMUNICATIONS
  To provide methods of effective communication with gatekeepers, stakeholders, and interested citizens regarding the key elements of each Biosolids Management Program, including information relative to program performance.

THE ELEMENTS OF THE NBP BIOSOLIDS MANAGEMENT PROGRAM

The BMP Elements are organized around the five key areas of the Deming-based management cycle. Each area contains between one and six Elements, for a total of 17 BMP Elements.

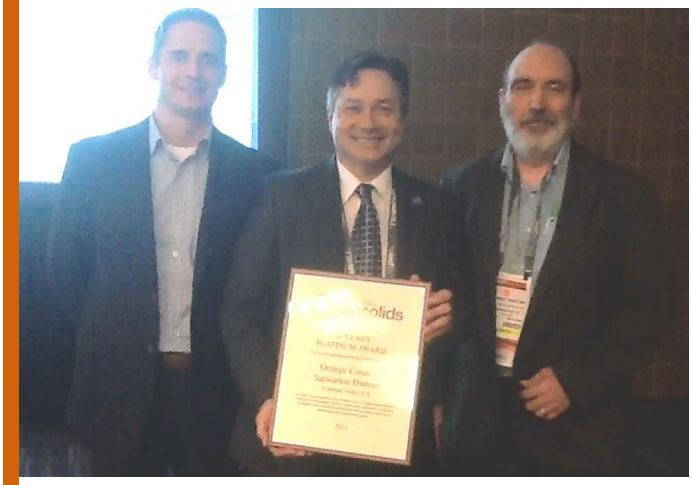


The Plan, Do, Check, and Act (P-D-C-A) cycle, as applied to the NBP BMP, is outlined below:
Policy – Develop documentation of the BMP; make commitment to the NBP Code of Good Practice.
Planning – Identify existing and potential critical control points, determine legal and other requirements, and establish desired outcomes/public expectations.
Implementation – Assign roles and responsibilities, provide training for necessary skills and knowledge, and establish communications activities, standard operating procedures, and practices.
Measurement and Corrective Action – Assess success in meeting legal and other requirements, goals, objectives, and performance standards, and institute corrective action to correct problems.
Management Review – Periodically review the progress and performance to ensure effectiveness of the BMP.

Policy	Plan	Implementation	Check	Review
1. BMP Manual	3. Critical Control Points	7. Roles and Responsibilities	13. Monitoring and Measurement	17. Management Review
2. Biosolids Management Policy	4. Legal and Other Requirements	8. Training	14. Nonconformances: Preventive and Corrective Action	
	5. Goals and Objectives	9. Communication	15. Biosolids Management Program Report	
	6. Public Participation in Planning	10. Operational Control of Critical Control Points	16. Internal Management System Audit	
		11. Emergency Preparedness and Response		
		12. Documentation, Document Control, and Recordkeeping		

10 YEARS PLATINUM

WEF, NACWA, and U.S. EPA were on hand to award three organizations (Orange County Sanitation District, CA; City of Los Angeles, CA; and DC Water, DC) with the prestigious NBP 10 Years Platinum Award on October 1, 2014 in New Orleans, LA, during WEFTEC® 2014.



(From Left to Right) Chris Hornback, NACWA; Chris Stacklin, OCSD; and Bob Bastian, U.S. EPA

Chris Stacklin, Orange County Sanitation District, CA (OCSD) (Right)

(From Left to Right) Chris Hornback, NACWA; Omar Moghaddam, City of Los Angeles; and Bob Bastian, U.S. EPA

Omar Moghaddam, City of Los Angeles, CA (Right)

(From Left to Right) Chris Hornback, NACWA; Bill Brower, DC Water; Chris Peot, DC Water; and Bob Bastian, U.S. EPA

Chris Peot and Bill Brower, DC Water, Washington D.C. (Above)

PLATINUM CERTIFIED AGENCIES

- Continually demonstrating the highest level of commitment to excellence in Biosolids Management;
- Operating in accordance National Biosolids Partnership standards; and
- Annual audits – self-assessments and at least three independent, third-party audits every 5 years

The following are innovation highlights from our Platinum Certified organizations for the 2013-2014 certification cycle:

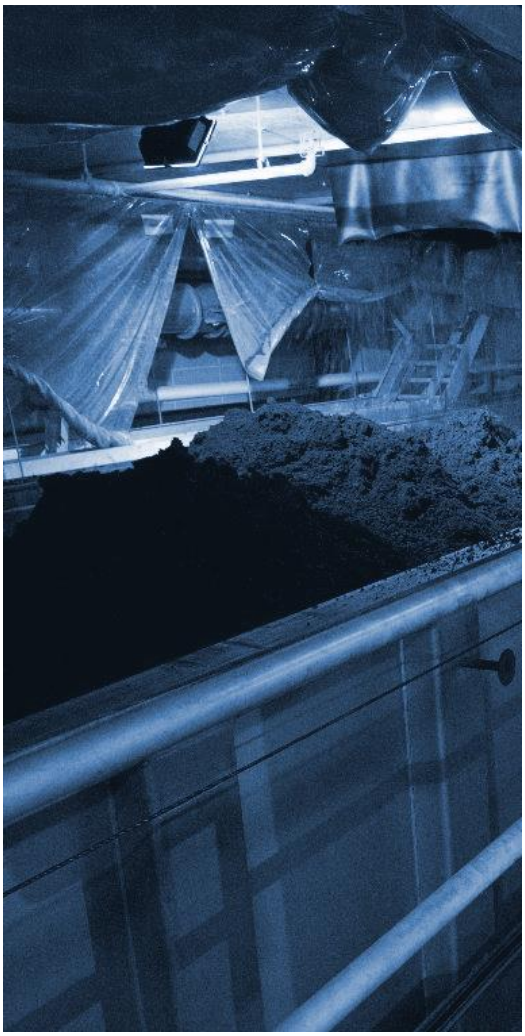
Alexandria Renew Enterprises,

Alexandria, VA (certified: 29-APR-2008)

- The goal of AlexRenew's biosolids EMS is to develop the capacity to reuse 100% of its biosolids. This objective is intended to draw interest from the science and engineering community in proposing a totally innovative approach for alternatives to land application of biosolids. It is intended to be the first phase of a multiphase approach to creating options for alternative uses of biosolids.

"Using the methane gas created by bacteria in the digesters, AlexRenew generated close to 130 million cubic feet of renewable energy – enough gas to heat 793 homes for a year."

AlexRenew removes over 90% of the nitrogen and close to 100% of the phosphorus



- AlexRenew developed an action plan in which the organization is partnering with regional utilities to investigate the feasibility of a biosolids-to-energy (B2E) project. Should this project be determined viable and implemented, environmental benefits would result in reduction of greenhouse gases through replacing the use of standard energy sources with biosolids to energy.

In the past year:

- AlexRenew entered into an agreement with DC Water to help them start up new anaerobic digesters as part of their biosolids program to produce Class A biosolids.
- AlexRenew continued participation in biosolids research initiatives, specifically working with Virginia Tech, George Mason University, DC Water and Water Environment Research Foundation.
- AlexRenew beneficially reused 100% of their biosolids.
- Numerous outreach activities were performed in 2013, including a substantial number (17) of plant tours, Earth Day participation, Earth Force display, Ellen Pickering Environmental Excellence Award, participation in School Programs and STEM Mentoring efforts, and conference attendances.
- AlexRenew is continually improving and advancing with a mature program that now merges the biosolids BMP and ISO 14001 EMS.

According to the auditor:

- AlexRenew established a model preventive and corrective action program.
- AlexRenew staff implemented an exemplary demonstration project showing the usefulness of biosolids through the innovative application of George's Old Town Blend in a garden plot. This garden plot has become a key stopping point on facility tours.

Atlantic County Utilities Authority, Atlantic City, NJ

(certified: 03-NOV-2014)

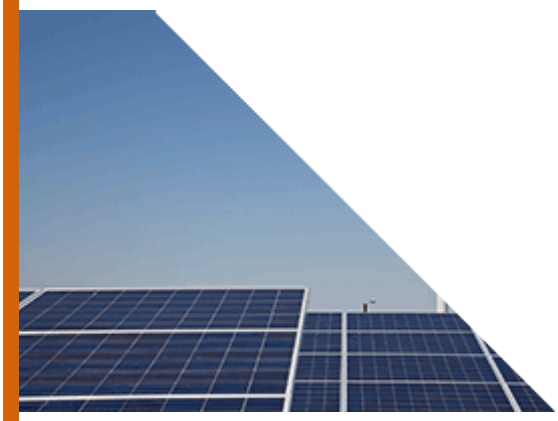
- Atlantic County Utilities Authority (ACUA) provides wastewater treatment for 14 municipalities within Atlantic County, NJ. Facilities include over 60 miles of sanitary sewers; 21 pump stations; a 40 MGD, complete mix, waste activated sludge treatment plant; thickening and dewatering processes; and two multiple hearth incinerators. An additional quantity of biosolids from neighboring treatment facilities is also processed by ACUA.
- ACUA's power portfolio includes the 7.5 megawatt Jersey-Atlantic Wind Farm and a 500 kilowatt solar installation, both located at the treatment facilities site in Atlantic City. ("the solar energy project has saved the ACUA more than $2,397,752, and along with our wind farm, prevents an average of 8765 metric tons of CO_2 from entering the atmosphere each year"). Solar panels are located on the ground, roof tops and on a canopy over the employee parking lot. Excess energy is provided to the power the local grid in the Atlantic City area.

"The ACUA has established itself as a community leader in protecting the environment and advancing the use of renewable or green energy to help reach that goal. In 2013, our projects saved ACUA and its ratepayers more than $1.6 million dollars."

http://www.acua.com/green-initiatives/

In the past year:

- ACUA achieved Platinum Certification in 2014.
- ACUA is reducing biosolids incinerator auxiliary fuel usage (an aim of 20% from base years 2010 to 2014). This will also provide a reduction in the generation of greenhouse gases, along with savings realized through a reduction in the need for supplemental/auxiliary fuel.



- ACUA is additionally moving forward with an anticipated dewatering of solids to greater than 27% total solids at all times, and is aiming to improve contractor delivered solids to a quality of greater than 16% total solids at all times. These efforts can result in significant increases in the BTU/ton of solids incinerated.
- Several measurable variables are all concurrently being tracked, the most important of which is the auxiliary fuel used in MMBTU/Wet Ton of Solids and the MMBTU/Dry Ton of Solids. The end result of the improvements made through implementation of this goal and objective would be a reduction of $200,000 per year in costs.
- ACUA was successful in designing and implementing a more efficient means to convey the centrate from the activated sludge, thickening process. The end result of reducing electrical consumption by 50% met the original goal.

According to the auditor:

- ACUA audit team interviews were exemplary in terms of verifying the implementation of the standard elements and its procedures.
- ACUA has developed an excellent tracking tool to ensure that task checklist items of the Process Flow are examined and updated.

Camden County Municipal Utilities Authority, Camden, NJ (certified: 19-SEPT-2010)

- Camden County Municipal Utilities Authority (CCMUA) priorities include optimizing water quality performance in order to protect the rivers and streams of Camden County; optimizing odor control performance in order to minimize adverse impact to the neighboring community; maximizing cost efficiencies for the benefit of ratepayers, without sacrificing environmental performance; and community service.

CCMUA produces Class A biosolids that are beneficially reused as fuel for cement kilns.

CCMUA is the 2014 inaugural recipient of the American Planning Association Sustainable Green Infrastructure Project Award for excellence in sustainability.

"Achieving efficiencies in operations resulted in improved environmental performance and cost savings."

- Economic benefits of the CCMUA BMP include:
  - Reduced O&M Costs by 25% within 3 years
  - Annual Savings of $5,000,000 per year
  - $50,000,000 saved since 1999
  - No rate increases since 1996, with three rate cuts

- CCMUA increased effluent quality significantly by capturing an additional 10-15,000 tons of sludge annually, thereby resulting in a positive impact on the Delaware River. In addition, suspended solids levels have been reduced from about 25 parts per million to about 7 parts per million.

In the past year:

- CCMUA improved odor control performance by installing approximately $20 million in new odor control equipment and also implementing institutional and operational controls to improve performance.
- CCMUA reduced operating costs such that the CCMUA's user rate is actually lower than it was in 1996. Specifically, the CCMUA has held its rate for the past 15 years, with three rate cuts, while simultaneously improving environmental performance.

According to the auditor:

- CCMUA is a leader in external communications and community outreach, exemplifying best practice for resource recovery utilities. 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.
- The Camden Collaborative is an excellent example of a proactive public participation approach that includes participation from local officials, government, and CCMUA.
- CCMUA has received national recognition for environmental initiatives. 31 raingardens have now been built in Camden.

Casella Organics Hawk Ridge Composting Facility, Unity Plantation, ME (certified: 31-JAN-2009)

- Casella Organics has begun operation of its second anaerobic digester to manage Source Separated Organics in addition to biosolids.
- As a result of BMP continuous improvement, Casella developed and initiated MOUs with Resellers to define responsibilities and performance expectations.
- Casella Organics is committed to expanded use of anaerobic digestion.
- More than 75 water resource recovery facilities employ Casella services to manage more than 250,000 tons of biosolids each year.

Efforts to reduce energy consumption resulted in a 10% decrease in total energy costs.

Beneficial uses of Casella products include: Lime stabilized agricultural fertilizer, compost, value added compost products like mulch and growing media, farmland restoration, gravel pit reclamation, pelletized fertilizer for agriculture and turf application, bagged fertilizer, and manufactured topsoil.

In the past year:

- Casella Organics Hawk Ridge Composting Facility improved product quality by seeking options for best managing the pad space used for aging its products. They recently trialed a couple of windrow turners to add to its options for creating quality compost.
- Casella is also employing Information Technology solutions through the use of tablets and other mobile platforms to allow their team to capture real time Customer Feedback.
- Casella customers, resellers, and regulators are positive about product quality, communication and service.

Casella has found great value in their Biosolids Management Program:

"

We have found the most valuable component of our program to be our internal review of processes and procedures. Having the focus and humility to honestly evaluate the effectiveness of each process provides us the ability to address change in the most productive manner. Creating a culture where anyone in our organization is encouraged to suggest and initiate positive change to our processes and procedures. We find the grassroots approach much more effective than a top down approach.

"

Central Davis County Sewer District, Kaysville, UT

(certified: 05-NOV-2007)

- Central Davis Sewer District (CDSD) biosolids are recycled through direct land application of Class B biosolids on lands owned by the District immediately surrounding the District's water resource recovery facility and through the distribution and marketing of composted Class A biosolids. CDSD is committed to proactively improving all aspects of the CDSD biosolids management program.
- 100% beneficial Reuse for the past 15 years.
- The District has an aggressive odor control program and public relations process.

In the past year:

- In the Regulatory Compliance outcome area, the District installed alum flash mixing equipment to augment phosphorus removal. An empirical evaluation of the impact of the chemical addition indicated that the phosphorus concentration was reduced by 50%. During the testing period the treatment facility did not experience any significant change in the concentration of heavy metals in the biosolids or an obvious increase in volatile solids reduction. Optimization of the alum addition process using the new alum/flash mixing equipment will commence as the regulatory drivers become more imminent. This goal also results in benefits in the Quality Biosolids Management Practices and Environmental Performance outcome areas due to the benefits derived in both of those outcomes.
- CDSD improved the material flow associated with delivery of raw materials (green waste) for creation of the required bulking agent (wood chips), and safe loading of final compost products into citizens' vehicles.
- CDSD successfully evaluated farming operations with respect to biosolids application process and cropping practices to ensure maximum crop yields, thus increasing the potential for solids application and nutrient uptake.
- As part of the NBP BMP Environmental Performance outcome area goals, CDSD installed a second step screen in the headworks vastly improving rag removal to lessen the accumulation in the anaerobic digesters and improve performance of the biosolids process operations. The cost savings associated with this improved performance was estimated to be $10,000 per year in reduced maintenance alone.

Each member of the CDSD Board plays a key role in the implementation of the system.

Only facility in Utah NBP-EMS Certified

Involved in State Water Quality Board and Sub-committee on Water Quality Rules

During the past 10 years Central Davis Sewer District has been awarded the outstanding biosolids program three times.

According to the auditor:

- CDSD has continued to expand its excellent library of training videos addressing wastewater operations and biosolids management. The latest additions include the Cobey Pile Turner operations and Rotochopper In-line Grinder operations. This brings the total number of training videos to 25 – an admirable accomplishment.
- The CDSD Board of Trustees has established a benchmark management leadership program, which other wastewater agencies should emulate. The Board is not only knowledgeable regarding the Biosolids Management Program, but also actively supports the National Biosolids Partnership Code of Good Practice.

Chattanooga Moccasin Bend Wastewater Treatment Plant,

Chattanooga, TN (certified: 12-FEB-2009)

- More than 70,000 wet tons per year (Class A and Class B) of biosolids managed each year.

In the past year:

- Boilers servicing the anaerobic digesters are now able to run off of digester gas, resulting in better rotation of equipment and reduced monthly service cost, less outside energy usage, more savings, and a reduced carbon footprint.
- TVA pilot program in which Moccasin Bend agreed to temporarily reduce electrical load in the plant in times of heavy power demand, such as the recent polar vortex episodes, has resulted in a savings to the plant of $6,000 per month, and demonstrated commitment to good environmental stewardship.
- Reduction of carbon footprint and reduce energy use—digester gas used for boiler fuel 78.4% of measured days vs. target of 68.5%; low-cost energy savings recommendations are being implemented; savings target of $5,000 were exceeded by $2,128.
- Use of plant water as a substitute for potable water in foam suppression of chlorine contact tanks saved over 4 million gallons a year of potable water.
- Chattanooga implemented trend analysis focusing on metals concentrations and vector attraction reduction to ensure consistently high product quality.
- Chattanooga's outreach efforts far exceeded most of the annual targets, and were particularly effective with plant tours for school groups, and collaboration with Chattanooga's Water Quality group in delivering presentations emphasizing the importance of clean water in today's society.

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Class A quality capability was achieved in the filter press process.

Biosolids Management System information stations have been established throughout the plant to help communicate the system and requirements internally.

According to the auditor:

- A focus on energy reduction has resulted in 1.5% reduction from low-cost opportunities and an additional 10% reduction from installing Variable Frequency Drives (total approximately $80K/year).
- Participation in an energy curtailment program offered by the local electric utility is saving approximately $70K/year in energy cost.
- Reuse of digester gas as boiler fuel is resulting in savings of $25K/month in natural gas use.

DC Water, Washington, DC (certified: 30-SEPT-2004)

- Treats 340 to 370 million gallons of wastewater per day
- Produces 125,000 tons of biosolids per year (dry basis)

In the past year:

- Research on improved drought resistance of plants exposed to biosolids has led to improved explanations for crop yields being experienced.
- Major construction projects are well under way that will provide for new anaerobic digesters with storage facilities; new solids-thickening facilities; expansion of and improvements to the dewatering systems; and associated projects to improve biosolids and the solids handling processes, and to reduce odors on site and off site.
    - Anticipated benefits of the thermal hydrolysis project include:
        - Reduction of biosolids quantities by more than 50%
        - Improvement of product quality
        - Generation of 13 MW of clean renewable power
        - Dramatic reduction of greenhouse gas emissions
        - Millions of dollars in savings
- DC water was a sponsor for "Homegrown DC," featuring community garden and urban agriculture groups. The DC Water booth held a "compost sniff test" at the event attracting enthusiastic participants wanting to receive the compost product.

Biosolids are beneficially reused with approximately 90% given to farmers for crop fertilization and 50 tons per day to a Virginia compost production facility.

The BMP is estimated to have a positive effect on the local and regional economy by creating approximately 450 new jobs over a 5-year period. (http://www.dcwater.com/education/biosolids_faq.cfm)

According to the auditor:

- An excellent initiative is in place to consider wastewater and biosolids as resources as part of the agency's resource recovery programs. Seeing biosolids as a valuable product, rather than a byproduct, is leading to a more businesslike approach to biosolids disposition.

East Bay Municipal Utility District, Oakland, CA

(certified: 19-SEPT-2006)

- The East Bay Municipal Utility District (EBMUD) main water resource recovery facility has a permitted dry weather capacity of 120 MGD, and treats an annual average daily flow of 65 MGD.
- The facility produces 73,000 wet tons of biosolids per year (Class B).
- Solids collected from the primary and secondary wastewater treatment processes are sent to anaerobic digesters for stabilization. The stabilized solids are dewatered in centrifuges.
- EBMUD strives to beneficially reuse its biosolids in a sustainable and cost-effective manner. Currently, EBMUD's biosolids are recycled through land application on nonedible crop sites and alternative daily cover (ADC) at landfills. Hauling, land application, and utilization for ADC are performed by two contractors under general service contracts.

100% of the biosolids produced at EBMUD's Main Wastewater Treatment Plant (MWWTP) are beneficially reused.

In 2013, the MWWTP produced close to 130% of the electricity required to operate the facility.

Biogas production saves EBMUD approximately $3 million each year by reducing electric power purchases.

EBMUD is a net producer of renewable energy, selling energy back to the electrical grid. The facility can generate more than 55,000 megawatt-hours annually.

In the past year:

- Changing from ¾-inch to ¼-inch influent screens resulted is expected to reduce O&M costs and improve biosolids quality.
- Optimization of polymer use at the dewatering facility led to a 25% cost reduction (savings of $500K/yr).
- Automation of primary sludge blanket level detectors optimized sludge thickness levels to avoid sending excess water to the digesters, thus increasing available digester capacity and resulting in more stable operations.
- Replaced digester floating covers with fixed covers to reduce fugitive methane and odor emissions to the atmosphere.
- Nearly completed the second phase of a digester upgrade project that will result in an improved mixing system for all 8 of the first-stage digesters. The project also includes digester feed blend tanks to mix municipal sludges with high-strength wastes to provide a more homogeneous feed for enhanced digester stability and gas production.

According to the auditor:

- EBMUD management has a good understanding of the corrective action process and uses this process effectively throughout its biosolids program.

Encina Wastewater Authority, Carlsbad, CA

(certified: 10-AUG-2005)

- Encina Wastewater Authority (EWA) treats approximately 22 MGD of wastewater and has a design capacity of 40.5 MGD.
- EWA produces roughly 5000 dry tons of Class A Exceptional Quality biosolids per year.
- PureGreen is a registered commercial fertilizer in five states.
- Gas produced through the EWA anaerobic digestion system is a mixture of approximately 60% to 65% methane, 35% to 40% carbon dioxide, and small quantities of nitrogen, hydrogen, and sulfur compounds.
- EWA's cogeneration facility saves the utility about $1.5 million a year in energy costs.

PureGreen has generated over $250,000 in operational revenue.

100% of EWA's biosolids are recycled as a fertilizer, soil amendment, or biofuel.

EWA produces 75% of the energy that fuels the treatment plant.

In the past year:

- EWA has diversified the beneficial reuse and improved the marketability of PureGreen by selling to Tier II markets, which include fertilizer distributors, specialty agriculture, golf courses, and local communities.
- 3692 tons of PureGreen were distributed in 2013 to Tier II markets, representing a 68.5% increase from 2012.
- Tier II markets increased revenue by $65,869.
- EWA introduced a unified brand identity, community outreach plan, and social media strategy focused on connecting and communicating with the public in a personalized and meaningful way.
- EWA partnered with the Center for Applied Horticultural Research. The Center found that PureGreen can be used effectively as fertilizer for commercial ornamental plant production.
- EWA is recognized by USEPA as a top 20 Green Power Partner.
- CEMEX utilized 1356 dt of EWA Class A material as biofuel.
- EWA improved safety at its operating facility and in the community by collaborating with local emergency response agencies to enhance and test its safety and security procedures.

According to the auditor:

- Encina is an excellent example of how management systems should work.
- EWA demonstrates industry leadership through a unique biosolids marketing (Tier II) program.

Fort Worth (City of), TX (certified: 20-JUL-2005)

- The Village Creek Wastewater Treatment Plant (VCWWTP) provides regional wastewater treatment to Fort Worth and 22 customer cities, serving approximately 900,000 customers.
- VCWWTP is a 166 MGD advanced exceptional quality biosolids treatment facility producing 100% Class A product.
- VCWWTP produces and beneficially reuses an estimated 26,000 dry tons/year of biosolids.
- Approximately 90% of the energy required for aeration is produced by power generated through anaerobic digestion.

91.26% of VCWWTP's biosolids are beneficially reused/recycled.

In the past year:

- The electricity savings from employing the heat recovery steam generator and steam turbines at VCWWTP resulted in an average energy self-sufficiency of 74%.
- Steam turbines were responsible for an average energy savings of 1,707,000 kWh per month.

According to the auditor:

- VCWWTP has made considerable progress on its re-energized biosolids management program's goals and objectives and should see substantial cost and product quality benefits over the near term.

Grand Rapids (City of), MI (certified: 20-DEC-2006)

- The Grand Rapids Wastewater Treatment Plant (GRWWTP) provides wastewater collection and treatment for the City of Grand Rapids and nine surrounding communities totaling approximately 270,000 customers within a 200 square mile geographical area.
- The GRWWTP has a design capacity of 61.1 MGD and currently has an average daily flow of 43.93 MGD.
- The Grand Valley Regional Biosolids Authority (GVRBA) processes 100% of the biosolids from the City of Grand Rapids and the City of Wyoming Clean Water Plant.

In the past year:

- The city maintained 100% regulatory compliance at the water resource recovery facility after enduring maximum plant flows for several days following major flooding in 2013.
- Analyses demonstrated that metals are routinely 90% to 95% below the exceptional quality pollutant concentrations standards, with the exception of zinc and copper that typically are 80% and 85% below the limits, respectively.
- Achieved 100% compliance with regulatory requirements as related to biosolids and its NPDES permit.
- The screenings in the plant headworks are drier than in previous years, saving the city over $30,000 in hauling fees.
- A proactive grease and oil removal program at lift stations has saved $40,000 in labor costs.

According to the auditor:

- The Environmental Protection Services Department's Wastewater Treatment Plant personnel involved in biosolids management should be recognized for their outstanding achievements, and the exceptional features of their Biosolids Management Program.
- All personnel interviewed had an excellent knowledge and understanding of the biosolids management program.

Transformative breakthroughs include:

a "Real Time Nitrogen Controller" in half of its secondary treatment process. This controller reads ammonia coming into aeration and also leaving aeration. This unit automatically adjusts the dissolved oxygen set point to allow for nitrification. It runs the blowers as low as it can to obtain the desired ammonia results on the back end. This saves a considerable amount in electricity.

a unit that uses "Real Time E-Coli" monitoring. "We have tied this unit into our UV system and are using real time E-Coli numbers in our effluent to adjust our UV dosage for disinfection of our final effluent. This controls how much and how fast the dosage is increased or decreased to obtain the proper fecal coliform target levels to maintain our NPDES requirements for fecal coliform. This saves a considerable amount of electricity by throttling the UV lamp intensity."

Kent County, Milford, DE (certified: 02-DEC-2005)

- The Kent County Regional Wastewater Treatment Facility (KCRWTF) serves an estimated 130,000 customers.
- KCRWTF treats an estimated 12 million gallons of wastewater per day.
- The Frederica facility received national recognition and performance awards for putting innovative processes to use, such as photovoltaic solar, solar biosolids dryers, and UV disinfection.
- KCRWTF biosolids dewatering is accomplished via three belt presses. Lime is added for stabilization and pathogen reduction. Stabilized biosolids are further treated via thermal drying to produce Class A product (Kentorganite). The facility additionally employs passive solar drying.
- KCRWTF was the first facility in the country to be certified under three programs - the National Biosolids Partnership (NBP) Biosolids Management Program, as well as ISO14001, and OSHA 18001.

100% of KCRWTP's biosolids are land applied.

In the past year:

- Under the U.S. DOE "Save Energy Now" program, the University of Delaware Mid-Atlantic Industrial Assessment Center (IAC) provided an industrial assessment report to KCRWTF in an effort to identify and evaluate opportunities for conserving energy and improving productivity. According the IAC assessment report "implementation of all assessment recommendations would:
    - Reduce electric energy consumption by 1.39 million kilowatt-hours or 15.84% per year;
    - Reduce natural gas consumption by 1,968 million Btus or 6.85% per year;
    - Reduce carbon dioxide emission from electricity generation by 1,934,119 million pounds per year; and
    - Produce total cost savings of $175,736 dollars per year, a reduction of 18.34%." [http://www.co.kent.de.us/media/757895/UD-IAS-Reportl.pdf]

Knoxville Utilities Board, Knoxville, TN (certified 20-DEC-2011)

- Knoxville Utilities Board (KUB) yields an estimated 30,000 wet tons of biosolids per year.
- Biosolids production site: Kuwahee Wastewater Treatment Plant, Knoxville, TN.
- Volume of wastewater treated = 35 MGD (average), capacity of 120 MGD.
- Biosolids produced = 8000 dry tons per year (30,000 wet tons).
- KUB produces Class B biosolids.
- 100% of KUB's biosolids are beneficially reused.
- KUB's biosolids are registered as a fertilizer by the Tennessee Department of Agriculture.
- KUB also developed a corrective and preventative action system (CAPA) in-house as a tracking mechanism for action items that feed into the system from internal and third-party audits, management reviews, and other avenues.
- KUB has operated a Biosolids Beneficial Reuse Program for more than 20 years.
- KUB developed a biosolids dashboard. The dashboard gives operations personnel a visual snapshot of data points coming from various solids processes. Operators use the data to quickly monitor and assess plant performance.

100% of KUB's biosolids are beneficially used.

30,000 tons a year provided to local farmers registered with the Tennessee Department of Agriculture.

In the past year:

- Applied 6292 dry tons of KUB biosolids to 1525 acres on 29 farms in Grainger, Jefferson, Knox, and Morgan counties.
- KUB installed two new barscreens increasing the ability to remove more trash from the flow coming into the plant.
- The implementation of an asset management system, has led to understanding and prioritizing work based on criticality and is leading to predictive maintenance.
- Expanded communication with employees about the biosolids program, including the performance dashboard, improved recognition for biosolids as a product, and encouraged big picture view of operations.

According to the auditor:

- KUB has an excellent understanding of how to use the corrective and preventive action process.
- Action plans to achieve biosolids objectives and progress in achieving those plans are well documented.
- Operational control points and process controls are well developed.
- KUB's biosolids dashboard was noted as an industry best.

Lewiston-Auburn, ME (certified: 11-JUN-2010)

- The Lewiston Auburn Water Pollution Control Authority (LAWPCA) treats an average of 12.7MGD flow (and has a 14.2 MGD capacity)
- LAWPCA produces and estimated 26K cu yds (wet) of biosolids per year (45% Class B, 55% Class A).

In the past year:

- LAWPCA now has 33,000 cf of gas storage and 168,000 gallons of digested sludge storage.
- Estimated 35% reduction in dewatering due to anaerobic digestion (AD) process.
- 60% of the biosolids are converted to a compost product, MaineGro.
- As a result of AD, plant-wide purchased power is estimated to drop by 55%.

According to the auditor:

- Interested parties interviewed recognize that LAWPCA is making a strong effort to communicate about issues of concern.
- LAWPCA compost product appears to be of excellent consistency and mixing.

Littleton/Englewood, CO Wastewater Treatment Plant, Englewood, CO (certified 23-NOV-2013)

- Volume of wastewater treated = 21.1 MGD (average, with capacity 50 MGD)
- Biosolids produced = currently 3123 dry metric tons per year (100% Class B)
- USEPA Clean Water Act Recognition Awards for biosolids – recognized four times
- Rocky Mountain Water Environment Association awards for biosolids – recognized four times
- 33 continuous years of funding long-term biosolids research for dry land farming operations
- 100% of biosolids staff is certified via Colorado Voluntary Biosolids Land Appliers Certification program

100% of Littleton/Englewood biosolids are beneficially reused in agriculture application.

In the past year:

- Recycle of a nitrate-rich process stream to headworks reduces denitrification methanol demand by approximately 750 gallons/day and reduces odors.
- 4% reduction in fuel use for biosolids transportation achieved.
- Reduced electric energy requirements for treatment by .5%.
- 5% reduction in biosolids O&M program operation costs.

According to the auditor:

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

Note: Littleton/Englewood employs 76 individuals – not all are represented in the photo.

Los Angeles (City of), CA (certified: 04-SEPT-2003)

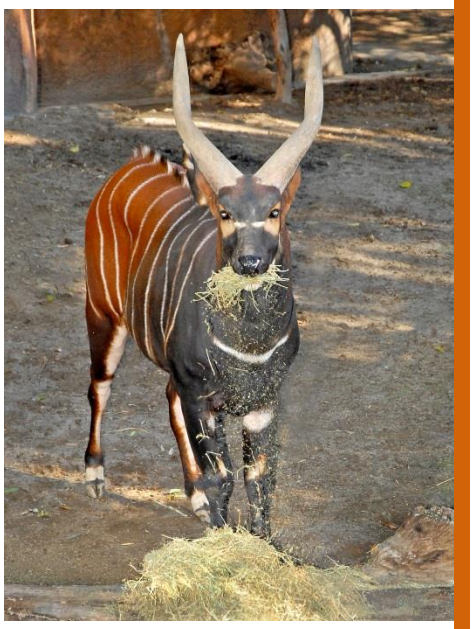
- The City of Los Angeles treats 137 billion gallons of wastewater produced annually by an estimated four million residents.
- Biosolids Production Location(s): Hyperion Treatment Plant, Terminal Island Treatment Plant
- Volume of Wastewater Treated (approximate):
  - Hyperion Treatment Plant = 380 MGD
  - Terminal Island Treatment Plant = 30 MGD
- Tons of Biosolids Produced (approximate):
  - Hyperion Treatment Plant = 635 wet tons per day (Class A)
  - Terminal Island Treatment Plant = 35 wet tons per day (Class A & digested sludge)
- Beneficial use program for 25 years
- Largest national Class A biosolids production for more than 10 years
- Innovative Technology: Terminal Island Renewable Energy (TIRE) Project

240,000 tons of biosolids are recycled and treated as a valuable commodity.

100% beneficial reuse of biosolids

In the past year:

- LA City's practice of openness and transparency with the public has led to active methods for engagement, including their website (127 million hits in the past year).
- Roughly 35 tons of crops amended with biosolids and grown at Green Acres Farm, were used for animal feed at the Los Angeles Zoo.
- Average demand for energy has reduced to approximately 18 megawatts compared to 21 megawatts 10 years ago.
- Recovery of digester off-gas for recycling and energy use has led to greenhouse gas reduction.
- Increased detention time in digesters and the use of egg-shaped digester has improved solids reduction to 55% to 60% compared to 51% to 55% in most plants.



According to the auditor:

- The Environmental Learning Center at Hyperion is an excellent example of using a proactive outreach to communicate with the public.

Louisville & Jefferson County Metropolitan Sewer District, Louisville, KY (certified: 31-JUL-2008)

- MSD treats wastewater from more than 270,000 customers.

In the past year:

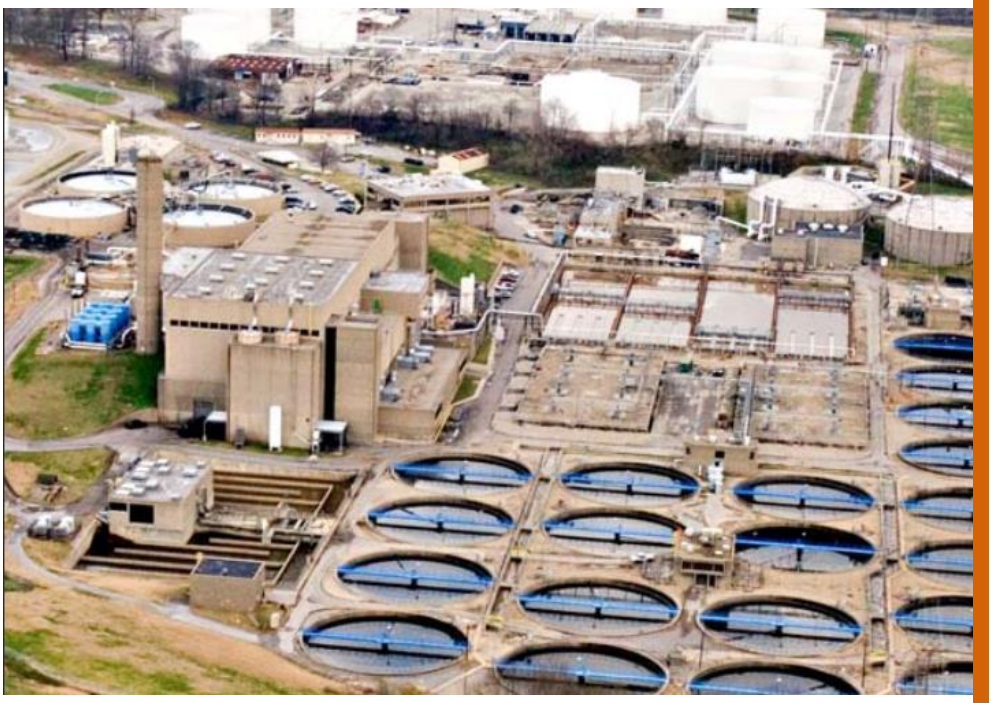
- 29,250 tons of Class A biosolids distributed :
  - 42% for agriculture in Kentucky,
  - 47% for agriculture in other states,
  - 11% for fertilizer blenders in other states, and
  - 1% bagged for local lawn and garden centers or used by local golf courses.
- $442,165 was generated from Louisville Green sales in 201 3.
- 100 % beneficial use saved MSD approximately $1,148,563 in landfill fees.
- Biogas from the anaerobic digestion process at Morris Forman fueled 87% of the heat demand for the drying process, resulting in an estimated $464,000 natural gas savings.

29,250 tons of Louisville Green biosolids were beneficially reused.

100% beneficial reuse

According to the auditor:

- The MSD management and all plant personnel involved in the biosolids environmental management system development should be recognized for their outstanding achievements, and the exceptional features of their Louisville Green Management System (LGMS).
- LGMS has established, and maintains an exemplary program for documentation, documents, files and records for the Biosolids Management Program. This organization can serve as a model for other agencies to follow.



- LGMS has established an excellent tracking program for periodically reviewing the measurable progress made toward accomplishing objectives.

Mankato (City of), MN (certified: 12-JAN-2010)

- The Mankato Wastewater Treatment Plant has a service population of approximately 58,000 people from five cities.
- Mankato has a design capacity of 9.38 MGD, and a maximum flow of 22.0 MGD.
- Mankato owns the 12 MGD phosphorus removal system, which was built by Calpine, a natural gas fired electrical generating plant, in exchange for effluent cooling water supplied to the electric plant.
- An estimated 95% of digester gas is used for fuel at the plant.

In the past year:

- 100% land application of biosolids.
- Mankato Energy Center uses an estimated 1.5 and 2 million gallons of reclaimed water per day for cooling, thus reducing water use from deep wells and saving the city approximately 400 million gallons of water. This results in a savings of at least $10 million for Mankato.
- The plant beneficially uses 4 million cubic feet of methane to heat buildings and equipment, averaging an annual savings of $125,000.
- Mankato saves an estimated $95,000 each year by using biosolids as fertilizer, rather than hauling to a landfill.

Metropolitan Water Reclamation of Greater Chicago, Chicago, IL (certified: 04-AUG-2008)

- MWRDGC produces approximately 165,000 dry tons of biosolids per year.
- The physical biosolids facilities and land application sites included in the audit and visited during the re-verification audit included the following facilities: Stickney Water Reclamation Plant and Monitoring and Research Offices, Lawndale Avenue Solids Management Area (LASMA), Calumet Water Reclamation Plant and Calumet Solids Management Area (CALSMA), John E. Egan Water Reclamation Plant, Hanover Park Water Reclamation Plant, Terrence J. O'Brien Water Reclamation Plant, and Kirie Water Reclamation Plant.

In the past year:

- High-strength waste in the form of grease trap cleanings was added to cleaned and refurbished digesters.
- The District has established an excellent system for collecting and managing large quantities of data, through the GIS tracking system. Data such as name, address, location, size, date, total quantity applied, application rate, loading rate, and other relevant site information are recorded for all sites that receive biosolids.
- 112,039 dry tons of biosolids beneficially reused from solids production at LASMA.
- 99% of solids production at MWRDGC was beneficially reused.
- Construction of eight circular gravity concentration tanks and new predigestion centrifuges at Stickney WRP is scheduled to be completed by Fall 2016.

The tracking of biosolids utilization sites with GIS is an excellent tool for enhancing biosolids management. It serves as another benchmark for all agencies that land apply residuals.

According to the auditor:

- The MWRDGC management and all plant personnel involved in the biosolids environmental management system development and maintenance should be recognized for their outstanding achievements, and the exceptional features of their BMP.
- MWRDGC has an exemplary public relations program managed by the Public and Intergovernmental Affairs Division that should serve as a model for all agencies.

Biosolids amended park. Photo reproduced with permission.

Orange County Sanitation District

Fountain Valley, CA (certified: 17-JUL-2003)

- The Orange County Sanitation District (OCSD) treats approximately 200 million gallons of wastewater per day, serving approximately 2.5 million customers.
- OCSD biosolids production location(s):
  - Reclamation Plant No. 1 - Fountain Valley, CA
  - Treatment Plant No. 2 - Huntington Beach, CA
- Tons of biosolids produced: Approximately 765 wet tons per day.
- OCSD recycles an estimated 265,000 wet tons of 279,000 biosolids produced per year.

OCSD was the FIRST facility in the nation to receive NBP Platinum Certification.

In the past year:

- Biogas from OCSD anaerobic digesters fuels a tri-generation (heat, hydrogen, and power) fuel cell and energy station. This demonstration project yielded power for an estimated 25 to 50 electric vehicles per day, and produced an estimated 250 kW of power for the water resource recovery facility.
- Regulatory limits are now in the Laboratory Information Management System (LIMS) database to alert if data are trending toward noncompliance.
- Now sending OCSD biosolids to be used in the Prima Deshecha landfill where the solids add to gas production for energy generation.
- OCSD is now able to transfer influent flow and sludge from Plant 1 to Plant 2 allowing greater operating flexibility and improving operator skills and experience.
- A video "Where do biosolids go?" is being used for internal and external communication and training. (www.ocsewers.com)

According to the auditor:

- Ongoing measurements, such as levels of service targets and key performance indicators, with dashboards for instant recognition, are being used effectively to monitor and improve operations.

Orange County, Orlando, FL (certified: 30-NOV-2007)

- Orange County Utilities (OCU) Water Reclamation Division serves over 146,000 wastewater customers.
- First utility in Florida to earn the certification from the NBP.
- 53 MGD of wastewater are treated and reused as reclaimed water.
- Approximately 32 dry tons per day are produced at the OCU biosolids facilities - South Water Reclamation Facility (SWRF), Eastern Water Reclamation Facility (EWRF), and Northwest Water Reclamation Facility (NWRF).
- Wastewater throughput (permitted): SWRF = 43 MGD, EWRF = 24 MGD, NWRF = 7.5 MGD
- Biosolids Production:
    - SWRF produces 4800 tons per year (Class B)
    - EWRF produces 5000 tons per year
    - NWRF produces 1500 tons per year
- EWRF and NWRF dewatered sludge is transported to a contracted plant for conversion to Class AA fertilizer that is registered with the Florida Department of Agriculture.

In the past year:

- Off-gas from digesters is being used as fuel for heating boilers.
- OCU's Fat, Oil, and Grease (FOG) program, including public education and grease collection events, has successfully reduced sewer overflows.
- Centrifuges are planned to be installed at all three plants to increase solids content.
- The Biosolids Master Plan has been completed to provide direction in diversifying biosolids use options over the next five years.

Raleigh (City of), NC (certified: 19-DEC-2006)

- The City of Raleigh Public Utilities Department (CORPUD) Neuse River Wastewater Treatment Plant (NRWWTP) treats an estimated 40 MGD of wastewater per day and has a 60 MGD capacity.
- The plant produces 35 to 40 dry tons of biosolids per day.
- NRWWTP produces Class A product (Raleigh Plus).
- NRWWTP produces 16,000 dry tons of biosolids per year (total Class A + B).

In the past year:

- NRWWTP is working with the NC Department of Agriculture to study the cost and feasibility to produce energy from plants. The plant currently grows sunflowers in order to study the production of biodiesel and determine the cost of seed crushing, equipment to produce and filter oil and processing the oil into biodiesel.
- City of Raleigh's Class A Distribution Program has distributed the Raleigh Plus product to over 500 farmers in 37 counties over the past 15 years.
- NRWWTP began 2014 land application to 335 acres of 354 newly permitted land.

Courtesy of the City of Raleigh

- Sanitary sewer overflows have reduced from approximately 95 to approximately 35 in the past 8 years.
- Management system planning and discussion has improved inter-Division communication, improving efficiency and making more resources available.
- Expanded use of the Management of Change procedure has improved planning and communication of changes.
- The internal audit process developed as part of the management system is being used to find deep causes of operating problems.
- Actuators have been installed on louvers in the blower room and sound blankets have been installed on blowers to reduce noise in response to public requests.
- Recognition for the management system has increased Wastewater Division credibility to a point where it is being used as an example for management system development throughout the Department.

According to the auditor:

- Department Managers understand the benefits of using management system approach.
- "Industry Day" hosted by Pretreatment provides excellent opportunity for discussing how industrial users can help protect water resource recovery facility operations and biosolids quality.
- The plant headworks building is exceptionally clean and relatively odor-free.

Courtesy of the City of Raleigh

Renewable Water Resources, Greenville, SC

(certified: 28-OCT-2011)

- The Renewable Water Resources (ReWa) provides wastewater treatment at the Durbin Creek, Gilder Creek, Georges Creek, Lower Reedy, Marietta, Mauldin Road, Pelham, Piedmont Regional, Piedmont & Altamont plants.
- ReWa treats an average of 41 million gallons of wastewater per day.
- ReWa produces 8200 dry tons of Class B product per year.

In the past year:

- Piedmont Regional, the first ReWa facility to use membrane bioreactor and thickening technology, utilizes state-of-the-art technology and features to increase efficiency, capacity, and safety for the environment and community.
- The ReWa MBR/T reduced the number of steps in treatment, no longer requiring the need for clarifiers and sand filters. MBR/T produced a thicker solid, thereby eliminating the need for gravity belt thickeners or belt press.
- ReWa's EMS program has shown **considerable growth** with more capital projects now being tracked through the Goals and Objectives.

According to the auditor:

- ReWa has comprehensively developed Standard Operating Procedures for the critical control points in the biosolids value chain.
- ReWa's Biosolids Management Documentation procedure contains an excellent outline and summary of the purpose of each element of the Biosolids Management Program.

Richmond Department of Public Utilities (City of), Richmond, VA (certified: 14-JAN-2011)

- Richmond's water resource recovery facility serves approximately 58,000 customers.
- The plant treats 45 MGD during dry weather flow and 75 MGD wet weather combined flow.
- The city provides biosolids to 43 farms in nine surrounding counties.
- Richmond land applies Class B biosolids through a third-party vendor.

The city currently is evaluating options for upgrading to a digester gas energy recovery system. The **estimated value** of annual digester gas production, based on its thermal energy potential, is approximately **$234,000**.

"The city of Richmond's wastewater treatment plant made the decision to implement a BMP for its biosolids program to document its environmental performance and ensure that biosolids are processed appropriately and safely. While a BMP program is voluntary, it requires an organization to look closely at its operational and management practices. It also allows us to surpass minimum regulatory requirements, to stay ahead of potentially more stringent regulations, and to strive for continual improvement."

In the past year:

- After start-up of Richmond's Fermentation system there should be a significant reduction of secondary carbon food needed for nitrogen removal. With the fermentation system the **reduction** should be **as high as 25%**.
- A thickening tank cover has been installed and data are being collected to demonstrate the frequency of noticeable odor generation (goal zero).

According to the auditor:

- The former biosolids supervisor and program manager has **set an example** in how to effectively and efficiently transfer the responsibilities of the biosolids management program to the new biosolids supervisor. Considerable effort and detail has been communicated during this transition period, and the **effectiveness** of this process was demonstrated during the interim audit.
- The continued hard work and dedication of the BMP Team is also acknowledged. While maintaining Platinum Certification status is obviously a team effort, the guidance provided by the Biosolids Managers to ensure continual improvement of the program is recognized.

Santa Rosa (City of), CA (certified: 29-JUL-2009)

- The City of Santa Rosa Laguna Wastewater Treatment Facility treats 17.5 MGD and is a tertiary-level facility.
- Class B biosolids are spread mainly as a soil amendment for fodder crops such as oat, hay, and rye. The land application sites currently in use are in both North and South Sonoma County (Land Application Sites). A portion of the treated biosolids are taken to the Laguna Compost Facility and mixed with green waste, producing Class A compost, which is then sold on the bulk market to landscape companies and wineries.

In the past year:

- The city worked with Bay Area Biosolids to Energy (BAB2E) project committee members to produce a working demonstration project to produce net energy.
- The facility installed a heat exchanger on Digester #3.
- The city maintained their Platinum Level Certification on August 1, 2014.
- The city completed a new combined heat and power facility to increase cogeneration power production efficiency by 10% over current efficiencies.

According to the auditor:

- The Laguna wastewater and biosolids operations staff maintains an excellent public image with EPA Region IX regulators and the Sonoma County Department of Health Services. Their history of going above and beyond the minimum requirements has positioned them as a model for other wastewater agencies throughout the state.
- The Santa Rosa BMS has excellent support from the highest levels of management.

St. Cloud (City of), St. Cloud, MN (certified: 13-SEPT-2014)

- The City of St. Cloud, MN Wastewater Treatment Facility provides treatment for the cities of St. Cloud, St. Augusta, St. Joseph, Sartell, Sauk Rapids, and Waite Park, service population of approximately 110,000.
- In 2013, the Rehabilitation, Upgrade and Expansion Project was completed that increased influent capacity to 17.9 MGD.
- The City of St. Cloud has been recycling biosolids for beneficial reuse on agricultural land for more than 40 years.

In the past year:

- The EMS goals and objectives set by the City of St. Cloud team in 2013 has ignited the work and output related to their new Resource Recovery and Energy Efficiency Master Plan. This plan will include short-term and long-term solutions and projects that **will result in reduction of costs and carbon footprint and additional resource recovery opportunities**.
- Considerable progress has been made to obtain 9.0% total solids (TS) cake at end of gravity belt thickener (GBT). This objective is to maintain the GBT product to between 8.5% and 9.5% TS; 100% of the time.
- St. Cloud completed installation of a second GBT, which provides redundancy in the process, reducing operational down time and guaranteeing consistent quality while meeting potential future demands.
- Data collection has been completed and the frequency of operational checking is being optimized to fine-tune the continuous operation of the GBT.
- In August 2014, two screw presses were being evaluated and used to pilot a struvite harvesting technology. Data being collected include total solids of the cake produced, total suspended solids in the filtrate, total solids decrease, total phosphorus removal, and nitrogen reduction.
- St. Cloud is researching and trialing the introduction of high strength waste for co-digestion to improve the generation of methane gas, enhance the recovery of energy and reduce the need to purchase of outside energy supplied. The utility will be looking at developing new biosolids and facilitywide goals and objectives based on a recently emphasized concept of resource recovery and energy efficiency (R2E2).

Biosolids recycling provided a **carbon offset** in 2013 of **1,406,368 lbs of CO_2** (see, Carbon Footprint, http://mn-stcloud.civicplus.com/documentcenter/view/5133)

Leading the way to **sustainability in MN**, St. Cloud held an Ostara Nutrient Harvesting Pilot Demonstration Project for the public in Sept. 2014.

According to the auditor:

- The **Biosolids Management Program has excellent support from the highest levels** of management, ensuring continued success.
- The City has taken the initiative to label each of the trucks used to transport biosolids with a sign indicating "Biosolids Management Program."
- St. Cloud has developed an Equipment Operating Sequence (EOS) for several of its critical control points or process control points, such as the Gravity Belt Thickener and Blower Building. The EOS is located with the equipment so that all vital controls are at the fingertips of the operations staff.

Synagro South Kern Compost Manufacturing Facility, Taft, CA

Synagro Technologies' South Kern Compost Manufacturing Facility (SKCMF) is one of the largest commercial compost facilities in the United States. The 44-acre facility is a California qualified recycling facility that receives and processes recycled materials- biosolids, green and wood waste - from municipalities and utilizes air emission control devices to reduce environmental impacts. The commercially valuable end product is AllGro™, a high-quality composted soil amendment product, which is used in the agricultural, landscaping, horticultural and soil blending markets. In February 2014, the facility's National Biosolids Partnership's Biosolids Management Program ranking was elevated from gold level recognition to platinum certification.

In the past year:

- SKCMF has reduced energy consumption at the facility by replacing HID lighting with LED fixtures.
- SKCMF is currently conducting research to determine the feasibility of using a positive aeration process to benefit the environment through reduced energy consumption and air emissions.
- Targeted training programs are being used to focus on key biosolids program activities.
- Customer acceptance of compost product is at an all-time high with no issues in well over a year.
- A Behavior-based Safety Program is in place and leading to employee engagement in continuing safety improvements.
- Key performance indicators (KPI) have been developed and are being used to track performance of the compost operation, including implementing a computerized maintenance management system to schedule and track equipment maintenance, minimize downtime, and increase equipment availability.
- SKCMF continues to provide support and benefits to the Taft community through engagement, educational, recreational and economic initiatives.

"Earning the Platinum Level Certification is a sign of the dedication and commitment from the team at the South Kern Compost Manufacturing Facility - the long hours, constant drive to continuously do better, and thinking outside the box has provided us the honor of Platinum Certification." Tony Cordova, Plant Manager.

Founded in 1986, Synagro is the leading green processor of organic by-products in the United States. Working with over 600 cities and governments across the country, Synagro's renewable solutions for communities reduce fertilizer use, minimize harmful run-off, and allow communities to meet or exceed environmental regulations.

NBP GOLD RECOGNIZED Organizations

- Excellence in Biosolids Management;
- Operating in accordance National Biosolids Partnership standards; and
- Annual audits – self-assessments and one independent, third-party audit every 5 years

Organizations with an active Gold recognition from the NBP for an EMS-based Biosolids Management Program are listed below. The NBP congratulates these leaders in biosolids management!

- Moorhead (City of) Wastewater Treatment Facility, MN
  - Moorhead Wastewater Treatment Facility treats an 4.5 million gallons of wastewater per day on average.
  - The Biosolids Storage Facility provides a 3.6 million gallon tank storage for Class B biosolids prior to land application.
  - The facility has two heated and mixed primary anaerobic digesters. Digester gas (approximately 65% methane) is burned in a boiler to heat the digesters to 95°F. Excess gas is used to heat buildings. An estimated 60% reduction in the volume of biosolids is achieved during storage and decanting.
  - Approximately 400 to 800 acres of land receive biosolids from the MWWTF annually.
- Resource Management Inc. Residuals Management Facility, New Hampton, NH
  - RMI has expanded its management planning to cover not just biosolids, but all residuals managed by the company. The elements and processes of the RMI BMP are applied throughout the company's operations. The Residuals Management Facility remains a central focus. "RMI finds the internal audit process of the EMS to be particularly valuable in demonstrating review by outside parties and in providing new perspectives that lead to continual improvements."
  - In its 4th year of operating under the NMP BMP, RMI continues to integrate the BMP practices into all facets of RMI operations. "In this past year, the positive influence for RMI's EMS was evident in RMI's website upgrade, expanded social media presence, thorough responses to compliance concerns, and the effective use of RMI's Incident Reporting system to continually improve their operations."
- Wyoming (City of), MI
  - The City of Wyoming and the City of Grand Rapids formed the Grand Valley Regional Biosolids Authority (GVRBA). This organization jointly manages the biosolids from both communities.
  - In 2013, the facilities goals, and objectives were rewritten to be SMART (Specific, Measurable, Achievable, Relevant, and Time-bounded).
  - Wyoming provides a consistent, value-added product through increased monitoring of the commercial users of the sanitary sewer system and treatment plant, and efficiencies continue to be closely regulated.
  - The facility participates in state level committees and continuing pre-emptive assessment planning for field selection and approvals.
  - The organization maintains 100% compliance with 503(b) Land Application Regulations. This goal has a 5-year target and is ongoing.
  - Another great year for our plant's performance against the stated biosolids policy. Our NBP certification level changed [in July 2013] to the Gold level. The Gold level certification allows us the required third party audit every five years…." An interim audit took place in December 2013.
  - Sustainability and environmental acceptability policy goals were both met in 2013 and are proving to be a success with ongoing financial analysis and monitoring.
  - "We are confident in our desired results of running a cost effective program while maintaining and enhancing public acceptance. The benefits realized with the use of the product are well known with our users and promoted around the region continuously."

NBP SILVER RECOGNIZED Organizations

- Operating in accordance National Biosolids Partnership standards; and
- Ready for first independent, third-party audit

Organizations with an active Silver recognition from the NBP for an EMS-based Biosolids Management Program are listed below. The NBP congratulates these leaders in biosolids management!

- Waco Metropolitan Area Regional Sewerage System, TX

NBP BRONZE RECOGNIZED Organizations

- Commitment to the "Code of Good Practice"; and
- Acknowledged goal of implementing the NBP standards, including the 17 Elements

Organizations with an active Bronze recognition from the NBP for an EMS-based Biosolids Management Program are listed below. The NBP congratulates these leaders in biosolids management!

- Bowling Green Municipal Utilities, KY
- Fort Collins (City of) Utilities, CO
- Harford County Department of Public Works, Bel Air, MD
- Houston (City of) Sims Bayou Treatment Facility, TX
- Ithaca Area Wastewater Treatment Facility, NY
- Manatee County Utilities Department, FL
- Metro Vancouver, Burnaby, BC, CN
- San Francisco (City of), CA
- Springfield (City of), MO
- Trinity River Authority of Texas CRWS, TX
- Upper Montgomery Joint Authority, Pennsburg, PA
- Village of Algonquin, IL

Electronic registration for NBP program can be found at:
http://www.wefnet.org/onlineform/nbpbmp/

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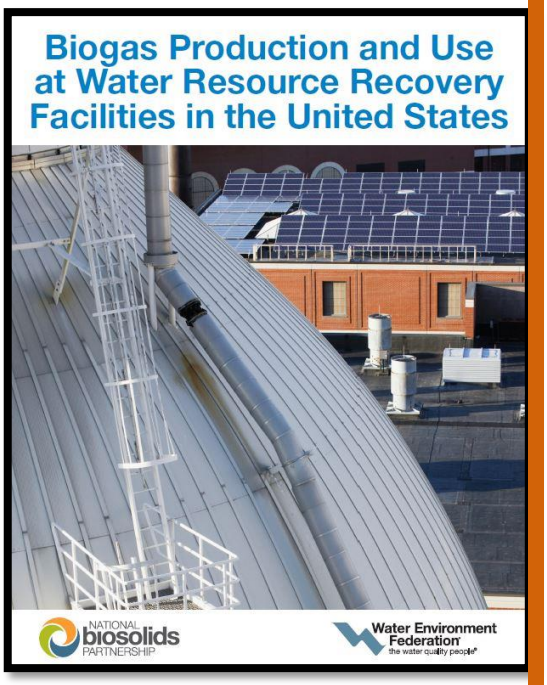
FOSTERING PARTNERSHIPS

Biosolids are moving from waste to resource. With a continued focus on best practices, quality, and management, coupled with communication, collaboration and innovation, the true value of biosolids is being realized. Last summer, WEF and the NBP released the report, *Enabling the Future: Advancing Resource Recovery from Biosolids*. The report examines the changing perceptions of biosolids as a renewable resource and the opportunities to use this resource to meet goals surrounding sustainability, energy, climate change, resource depletion, materials cycling, and zero-waste initiatives. It covers lessons learned and biosolids-related experiences to provide "practical guidance for utilities embarking on the road to resource recovery."

In February 2014, WEF and the American Biogas Council (ABC) entered into an MOU to accelerate organics recycling by jointly promoting the value of resource recovery, specifically the use of energy and products produced from biogas systems at wastewater treatment facilities. WEF and ABC together will promote the use of proven technologies that facilitate energy and nutrient recovery. They also will encourage federal and state legislation that promotes biogas use as a renewable energy source.

The groups also stated the importance of proactive communications and public outreach to further develop a strong base of support for products made from biosolids. This approach includes enhanced communication and education both within the profession and with the public.

Biogas Data

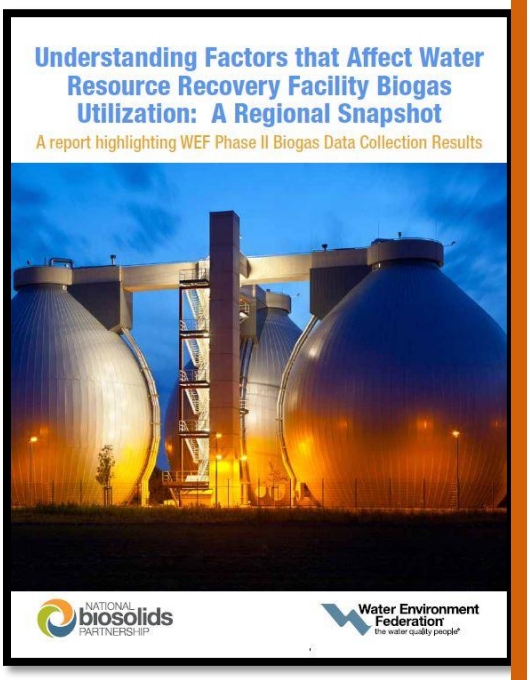


Future energy trends are influenced by numerous factors including the relative cost of alternative energy supplies, new source discoveries, and the cost to extract and produce energy sources. If renewable energy becomes reliable and affordable, energy use may turn away from fossil fuels and toward greener fuel sources. As the renewable energy sources and related technologies are evaluated, wastewater, biosolids, and biogas show promise as future energy sources that could reshape energy trends in the U.S. and beyond. To fully realize the benefits of these programs and of renewable energy on the whole, renewable energy technologies must be further developed and applied widely to provide clean, reliable, affordable energy on a much larger scale.

To that end, the wastewater profession has been striving to promote greater use of biogas produced at municipal WRRFs as a renewable and sustainable energy source. Biogas project developers, engineering consultants, and others require accurate data on biogas production to conceptualize, design, and develop renewable energy and resource recovery projects. In June 2011, WEF identified an information gap and sought to fill that gap by assessing the current and potential utilization of biogas from WRRFs for energy production, by identifying opportunities to support expanded biogas utilization through WEF's core capabilities in areas such as technology evaluation/transfer and education and training. A diverse project team, comprised of nonprofit organizations, communications outlets, consulting engineers, and vendors was established to assist with this project. With the help of the Project Steering Committee and Advisory Team convened by WEF, the team defined what data would be collected in the initial data collection effort that culminated in the release of the 2013 report, entitled *Biogas Production and Use at Water Resource Recovery Facilities in the United States*. The report highlights existing anaerobic digestion systems at U.S. Water Resource Recovery Facilities, as well as current uses of, and potential future opportunities for, using biogas produced by these facilities.

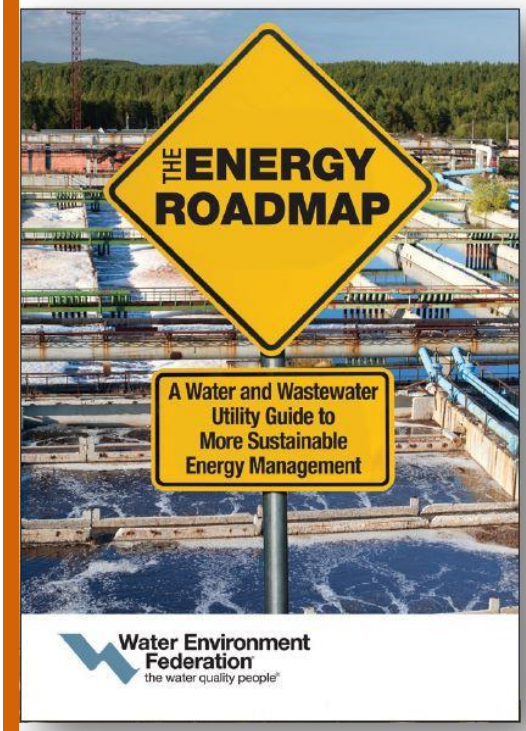
The Phase 1 report was considered a beginning to a longer ongoing data compilation process that would involve the collection of additional, more detailed data.

The portfolio of data is continuously being augmented. The data from Phase 1 activities is currently available at biogasdata.org, and upon release of the Phase II report set for January 2015, the entire website will be overwritten to reflect the tremendous volume of additional information that has been gathered during the last year. In an effort to focus on gaps identified in the dataset after the completion of Phase 1, a focus on innovative approaches to the data collection was employed to ensure effectiveness and efficiency in moving forward. Robust processes and requirements management were applied to enable the continuation of the collaborative commitment to advancing knowledge regarding biogas from biosolids. Phase 2 data collection efforts concentrated on gathering data in "regional sprints" aimed at focusing on populating data gaps identified during the Phase 1 data analysis, review, and reflections. The sprint teams were assigned states in specific regions of the country (based on U.S. EPA regional designations). The regions 4 and 6 data have provided a fascinating snapshot of emerging trends that can be obtained from current and developing data collection efforts.



http://www.BIOGASDATA.org

As is evident from the terrific work of many of the certified agencies highlighted in this annual review, quite a number of utilities have already taken the leap toward resource recovery and many more are peering over the edge. WEF's Energy Roadmap is designed to be a tool for utilities of all sizes and levels of advancement to identify areas for potential improvement, prioritize them, and then take the appropriate next steps toward increased energy independence.



WEF's Energy Roadmap is a series of steps to help wastewater utilities plan and implement a wastewater energy program. The roadmap is applicable whether plants choose simply to increase energy efficiency or to build a full-scale cogeneration system.

Steps are arranged under various topics, from technical needs to managerial aspects, and are applicable to small, medium, and large facilities.

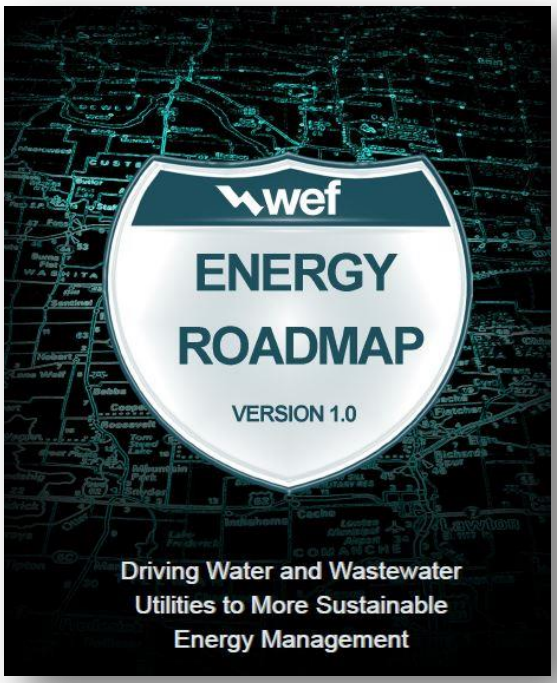
The steps are arranged under six topics:

- Strategic Management
- Organizational Culture
- Communication Outreach
- Demand Side Management
- Energy Generation
- Innovating for the Future

Under the six topics, the steps are organized into levels of progression. The first set of steps enables the organization. The second set integrates energy efficiency and generation into the organization's structure, culture, communications strategy, and technology. The last set of steps involves optimizing current processes and procedures.

The WEF Energy Roadmap Matrices and Overview

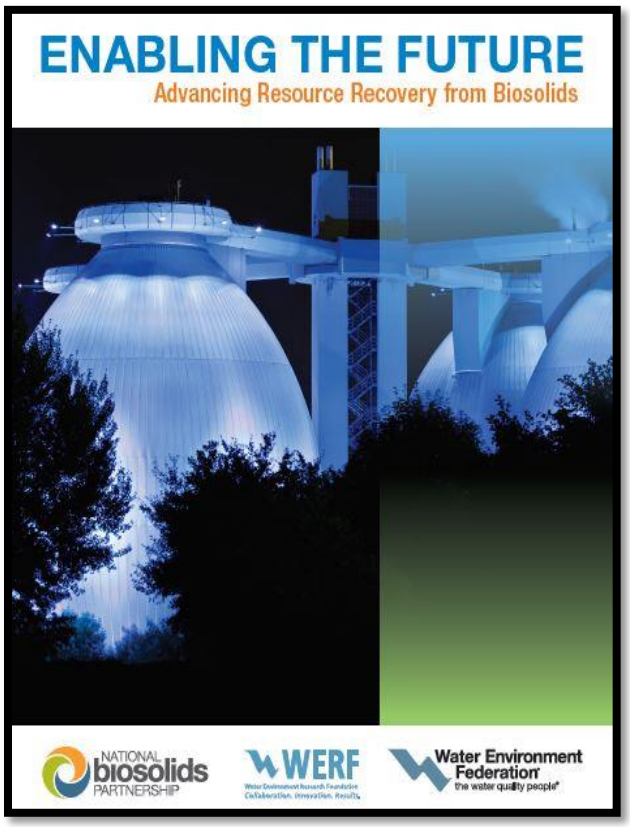
This document provides an overview of the Energy Roadmap efforts and the meeting at which the matrices were initially created. The matrices outline the basic steps a utility can take to become more energy efficient and to generate energy.



SUPPORTING A BIOSOLIDS INFORMATION HUB

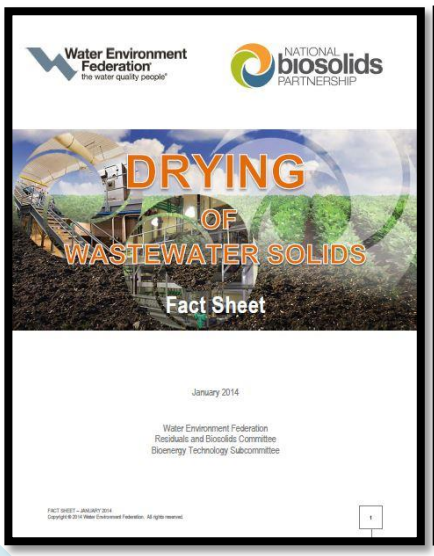
RECENTLY ISSUED RESOURCES

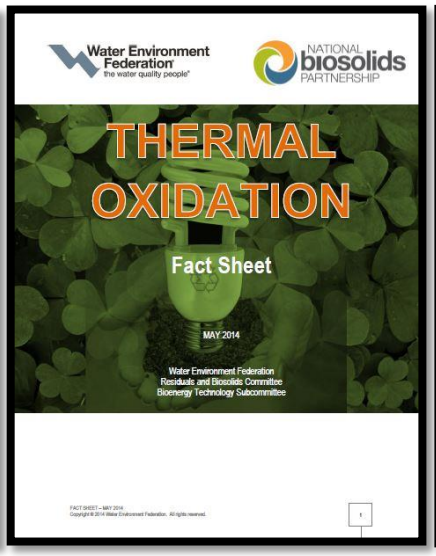
wefcom
connecting water professionals
http://wefcom.wef.org

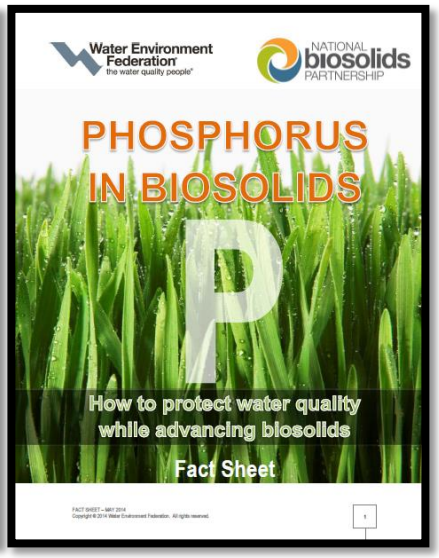


The NBP is continuing work on:

- Creating easy and timely access to organic solids management information.
- Acting as a referral for sources of both knowledge and "response" information, to enable organic solids managers to quickly and credibly respond to questions and concerns.
- Making existing and new research findings conveniently accessible.
- Establishing proactive "push" capability for regular dissemination of organic solids information, and examining options for creating additional mechanisms for dissemination of information – social media, mobile apps, etc.

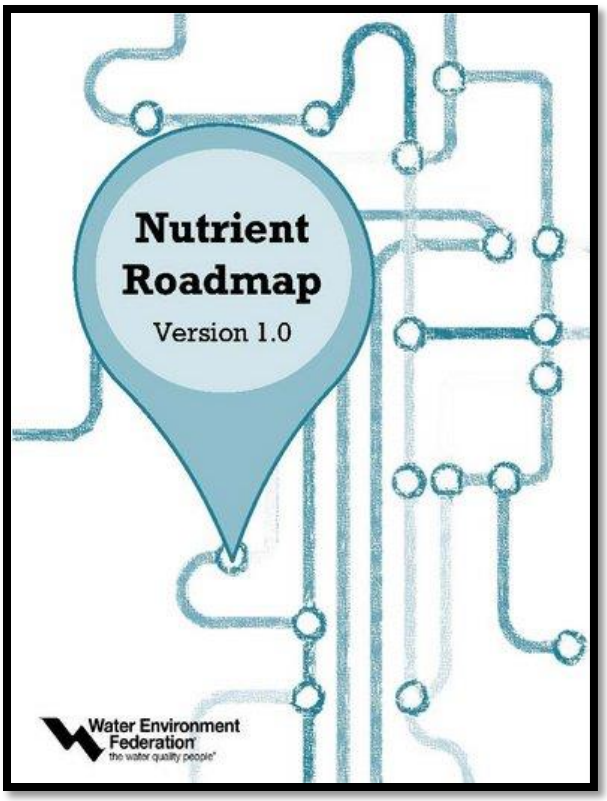






Download at

http://www.biosolids.org



Nutrient Roadmap Primer offers a short introduction to a longer book, which will provide a path forward for the wastewater sector on nutrient removal and recovery. The roadmap challenges water resource recovery facilities to have a zero net impact with regard to nutrient discharges by 2040.

http://www.wef.org/nutrientroadmap/

Mark your calendar.

The Utility Management Conference™ 2015
Austin, Texas | February 17–20, 2015
www.wef.org/UtilityManagement2015

Water and Energy 2015
Washington, DC | June 8–10, 2015
www.wef.org/WaterEnergy

Collection Systems 2015
Cincinnati, Ohio | April 19–22, 2015
www.wef.org/CollectionSystems

Nutrient Symposium 2015
Coming July 2015
www.wef.org/Conferences

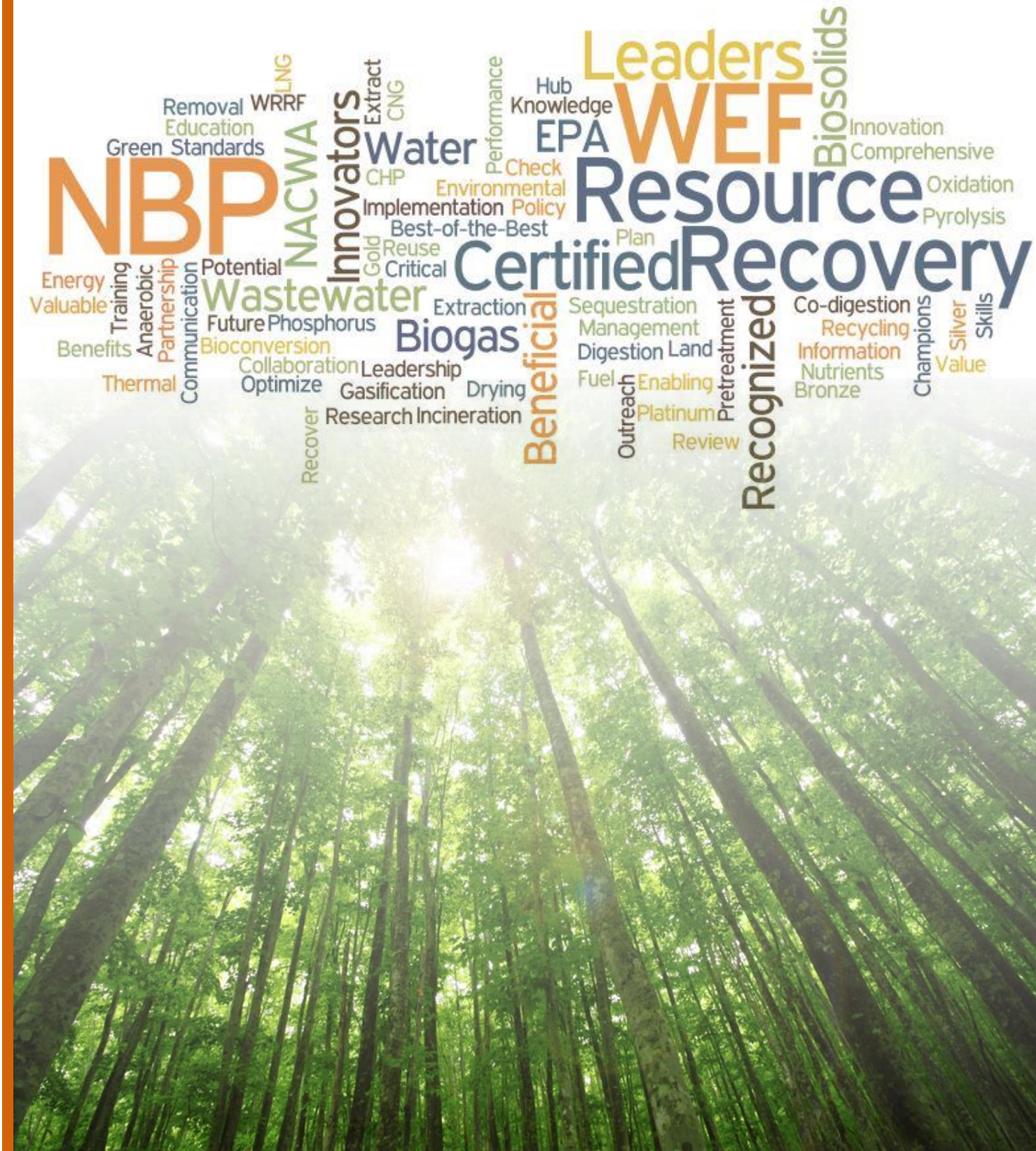
WEF/IWA Residuals and Biosolids 2015
Washington, DC | June 7–10, 2015
www.residualsbiosolids-wefiwa.org

Intensification of Treatment Forum 2015
Coming August 2015
www.wef.org/Conferences

Continue your education by attending WEF's upcoming educational events.

2015

Seminar Series | www.wef.org/Seminars
Washington, DC | June 8–9, 2015
Topics: FOG, Disinfection, Odors, Resiliency, etc.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Biogas
Hub
Knowledge
EPA
Performance
Check
Extract
CNG
LNG
WRRF
Removal
Education
Green
Standards
CHP
Environmental
Policy
Implementation
Best-of-the-Best
Plan
Reuse
Gold
Critical
Potential
Energy
Valuable
Training
Anaerobic
Partnership
Communication
Future
Phosphorus
Benefits
Bioconversion
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Gasification
Drying
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