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December 15, 2017

Mr. Jeff Bell  
 Department of Resource Management  
 Environmental Health Division  
 675 Texas St.  
 Ste 550  
 Fairfield, CA 94533

Re: Annual Report to the Solano County Board of Supervisors – Land Application of Biosolids in Solano County

Dear Mr. Bell,

On behalf of the Bay Area Clean Water Agencies Biosolids Committee, enclosed is the 2017 Annual Report that summarizes the generators' activities related to land application of biosolids in Solano County and each agency's compliance with the requirements in Chapter 25 of the Solano County Code. This report is being sent to you via email and a hardcopy was also mailed to the above address.

Bay Area Clean Water Agencies appreciates the opportunity to present this report for your consideration and will work with staff to address any questions you may have. We look forward to the continued partnership with Solano County and ensuring future success of biosolids end use.

If you have any questions or need clarification regarding this report, please contact me at 415-242-2233 or Alicia Chakrabarti at 510-287-2059.

Sincerely,

Ravi Krishnaiah – SFPUC Biosolids Manager

cc: Alicia Chakrabarti, P.E. – BACWA Biosolids Committee Chair

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**A G E N C I E S**



**ANNUAL REPORT to the  
SOLANO COUNTY BOARD OF SUPERVISORS**

## **LAND APPLICATION OF BIOSOLIDS in SOLANO COUNTY**



**Prepared by the BACWA Biosolids Committee  
December 2017**

## **Introduction**

With the 2017 application season recently completed, the Bay Area Clean Water Agencies (BACWA) Biosolids Committee is pleased to present its annual summary report on land application of biosolids in Solano County. BACWA wishes to express its sincere appreciation to the staff of the Environmental Health Services Division of the Department of Resource Management for the continuing support of the biosolids land spreading program, which permits many of our member agencies to continue to apply biosolids on agricultural land in the County. We believe this partnership provides a valuable resource to the Solano County agricultural industry and provides many Bay Area agencies with an opportunity for cost-effective, beneficial use of biosolids and to make a positive impact on the environment.

This report provides information on trends in the use of biosolids resources in California and the Bay Area, an update on regional biosolids programs, and specific information on projects from individual agencies currently applying biosolids in the County. It highlights each agency's compliance with the requirement in Chapter 25, Article IV, Sec. 25-400 that "Class B biosolids may only be land applied provided that the generator of the Class B biosolids is individually or as part of a consortium having a portion of their biosolids produced as Class A Exceptional Quality biosolids, converting biosolids to energy, or otherwise diverting Class B biosolids away from land spreading or landfilling (as waste or as Alternative Daily Cover)."

This report is intended as supplemental information to the report submitted by the County Department of Resource Management staff and by Synagro, contract haulers and applicators of biosolids. It has been prepared for the Solano County Board of Supervisors in response to the Board's request for an annual update on agency activities and progress towards compliance with the goals set forth in County Code, Chapter 25. The affected agencies have coordinated the required reporting through BACWA to produce a single report for the Board.

We would like to acknowledge the assistance of your staff in working with BACWA member agencies throughout the year, particularly Jagjinder Sahota, Jeffrey Bell, Matthew Geisert, Misty Kaltreider, and Anthony Endow.

## **Municipal Agencies Applying Biosolids in Solano County**

The application of biosolids provides soil amendments and nutrients to enhance the productivity of the farmland using natural, recycled materials. Each agency that applies biosolids is required to meet strict standards and provides a report annually to the United States Environmental Protection Agency (USEPA) to demonstrate compliance. The following Bay Area agencies currently transport biosolids to agricultural land in Solano County under contract with Synagro:

Central Marin Sanitation Agency (CMSA)  
City of Calistoga  
Delta Diablo (serving Antioch, Pittsburg,  
Bay Point)  
East Bay Municipal Utility District (EBMUD)  
Ironhouse Sanitary District (serving Oakley  
and Bethel Island)

San Francisco Public Utilities Commission (SFPUC)  
Southeast Water Pollution Control Plant (WPCP)  
Oceanside Water Pollution Control Plant (WPCP)  
Town of Windsor  
Union Sanitary District (serving Fremont,  
Newark and Union City)

A total of 6,243 dry tons were land applied on agricultural sites in Solano County in 2017. The portion from each agency is shown in Figure 1.

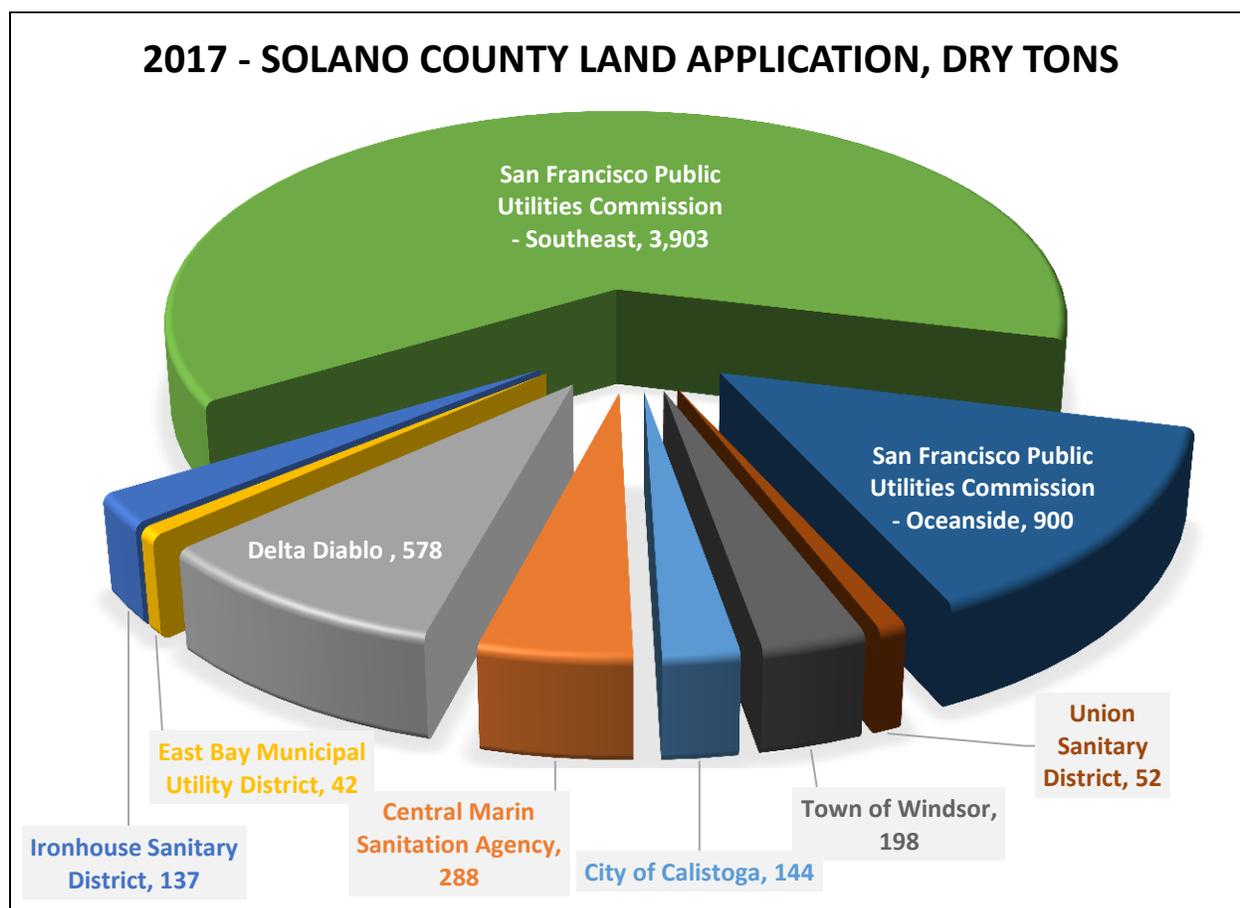


Figure 1. Amount of Biosolids Applied in Solano County by Each Agency in Dry Tons (2017). (Data provided by Synagro).

Data provided by Synagro indicates that the total quantity of biosolids applied to agricultural land in Solano County in 2017 decreased by 15 percent compared to the 2016 application season. The decrease may have occurred due to the recent installation of the Lystek Organic Material Recovery Center (OMRC) in Fairfield, which converts Class B biosolids material into a Class A EQ fertilizer product. Bay Area agencies began to send biosolids to the OMRC in 2017.

## Trends in Biosolids Usage in California

Wastewater agencies in California are continuing to identify and evaluate emerging options for biosolids reuse and recycling, including technologies to extract energy and nutrients. However, traditional uses still dominate the biosolids landscape, primarily due to cost and reliability. Some agencies are also evaluating or implementing process changes to produce Class A biosolids.

**Overall Use Summary.** Figure 2 summarizes the use of biosolids in California for calendar years 2009 through 2016. Data for 2017 are not yet available and will be included in the 2018 report. The number one use statewide continues to be land application in various forms, including compost, Class B land application, and Class A land application. From 2015 to 2016, land application of compost increased from 32 to 33 percent, land application of Class B biosolids increased from 18 to 21 percent, and land application of Class A biosolids decreased from 11 percent to 5 percent. Biosolids have proven to be a safe, reliable, and nutrient-rich soil amendment that offers a more cost-effective alternative to chemical fertilizers, which are increasingly expensive and very energy intensive to produce. Other significant methods for beneficial use and disposal include alternate daily cover (and other approved uses as a soil substitute) at landfills and landfill disposal.

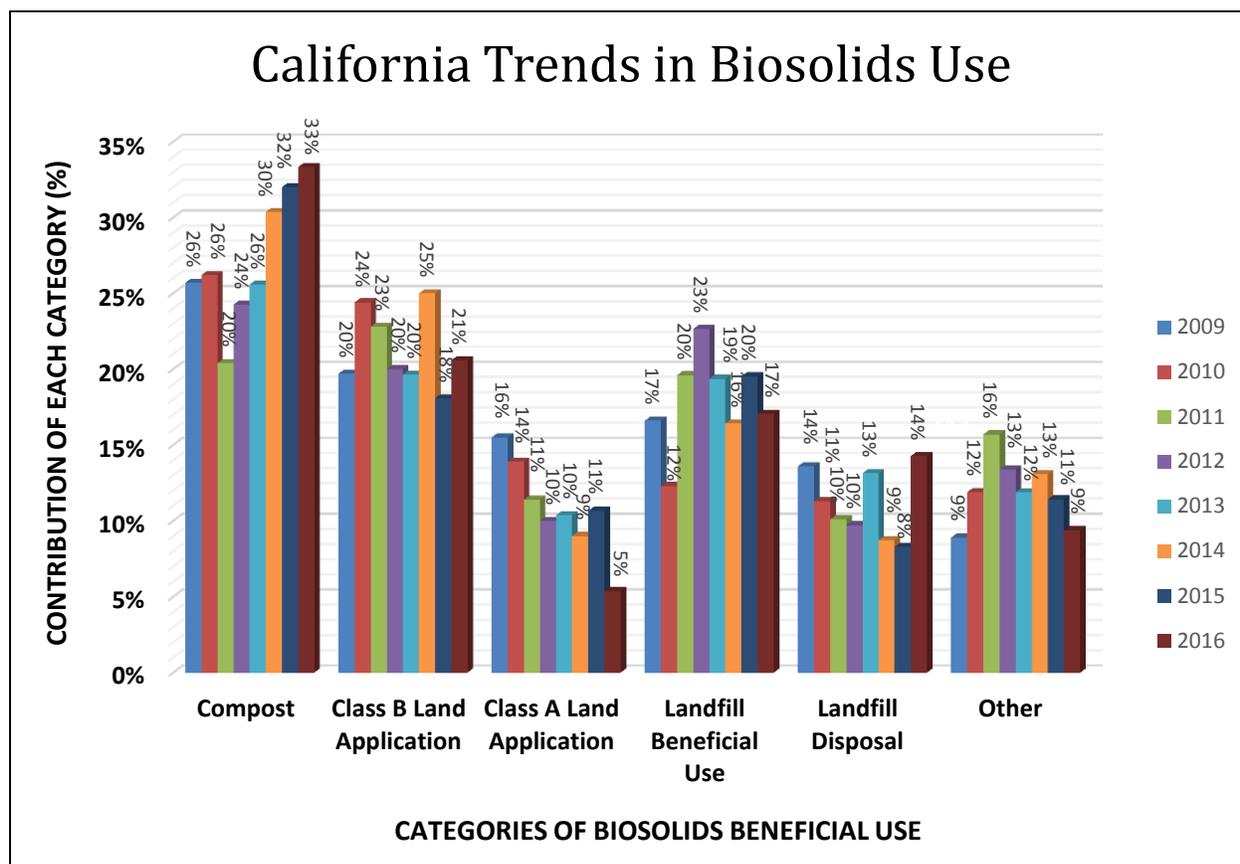


Figure 2. California Trends in Biosolids Use for the Years 2009 to 2016. (Data provided by USEPA Region 9).

**Bay Area Trends.** In focusing on the Bay Area, Figure 3 illustrates uses of biosolids in the nine Bay Area counties. The primary uses continue to be landfill beneficial use, land application, and incineration, which together account for over 90 percent of biosolids end uses in the Bay Area. Tonnage for biosolids conveyed to the new Lystek OMRC is categorized as Class A EQ liquid fertilizer. Compost, landfill disposal, and surface disposal levels remained similar to 2015 percentages.

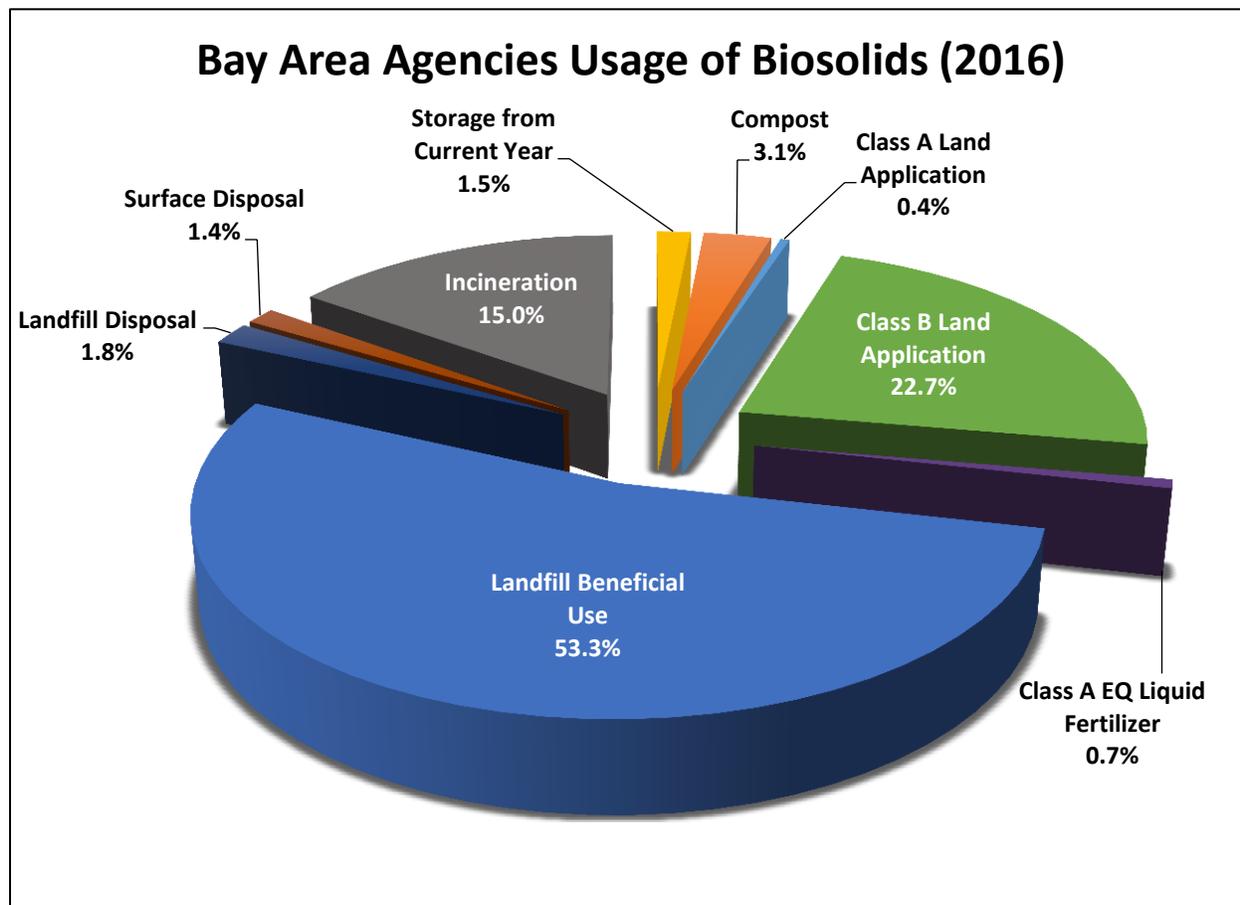


Figure 3. Bay Area Agencies Usage of Biosolids (2016). (Data Provided by USEPA Region 9).

Biosolids were applied to agricultural land in three different Northern California counties in 2016 with Solano County ranking third at 11 percent, similar to the previous year level at 8 percent. Figure 4 illustrates the distribution of land applied biosolids among the counties.

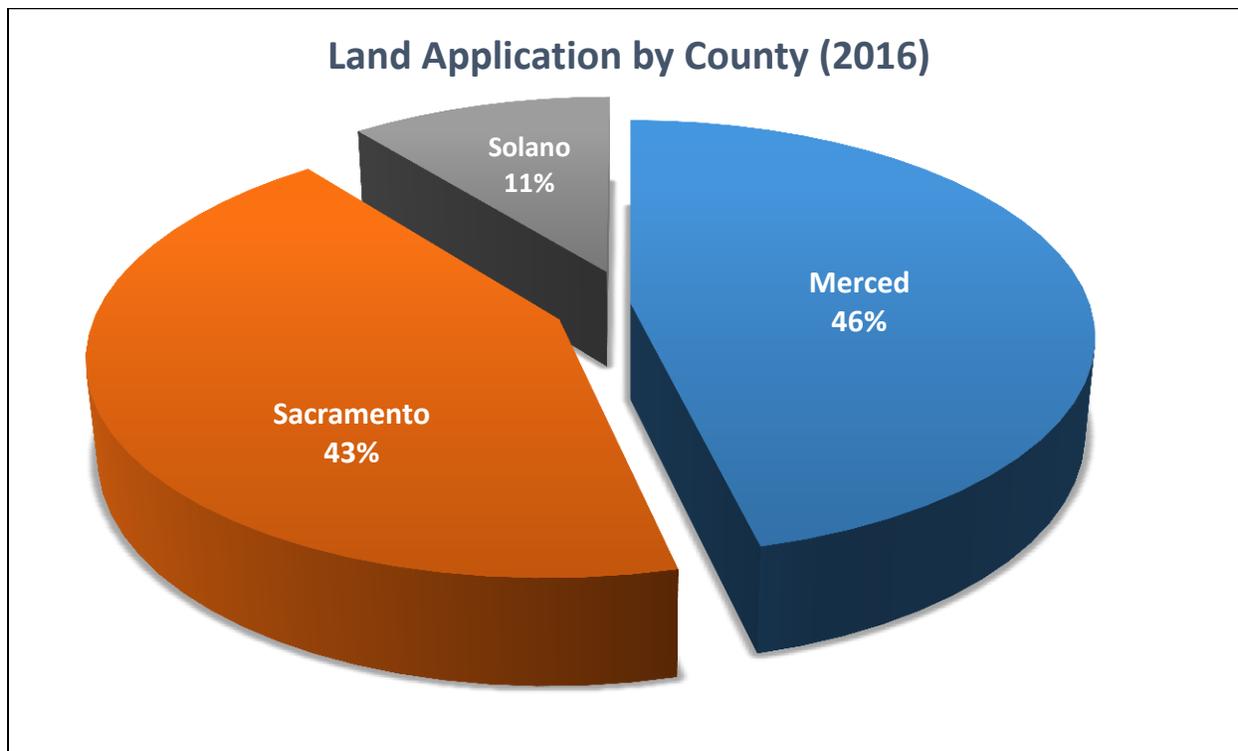


Figure 4. Distribution of Land Application of Biosolids among the Counties (2016). (Data Provided By USEPA Region 9).

### Bay Area Regional Efforts

**BACWA Biosolids Committee.** The mission of the BACWA Biosolids Committee (The Committee) is to support the development and maintenance of cost-effective, sustainable biosolids management options for the more than 133,000 dry metric tons of biosolids produced in the Bay Area annually. The Committee continues to provide proactive support and information sharing to member agencies on regional biosolids issues, projects, and proposed regulations and legislation.

The Committee holds quarterly meetings with an emphasis on biosolids technology information sharing among the participating agencies by providing facility tours and establishing a forum for vendors to present their products and technologies. In 2017, the Committee met at the Sacramento Regional County Sanitation District (SRCSD) and toured both the onsite biosolids pelletizing facility and the construction of the EchoWater Project, which when completed will upgrade SRCSD's wastewater system to improve water quality for water reuse. The Committee also toured William and Cloy Codiga Resource Recovery Center (CR2C) at Stanford University. The first-of-its-kind pilot-scale testing facility uses novel core wastewater treatment

infrastructure including a Staged Anaerobic Fluidized Bed Membrane Bioreactor (SAF-MBR). In 2016, the Committee conducted a survey of all BACWA members and compiled the results to show the production rates, current uses, costs, and future plans for biosolids management across member agencies. In 2017, the Committee completed the 2016 Biosolids Trends Survey Report, which is available at <https://bacwa.org/wp-content/uploads/2017/08/BACWA-2016-Biosolids-survey-report-1.pdf>. BACWA intends to repeat the survey in 2018 to help track changes in biosolids trends over time.

**Bay Area Biosolids Coalition.** The Bay Area Biosolids (BAB) Coalition originally formed in 2004 when a group of agencies came together to evaluate the feasibility of a regional biosolids management project to avoid the threat of a potential ban on land application of biosolids. By 2008, the membership expanded and the group decided to officially brand itself as the Bay Area Biosolids to Energy (BAB2E) Coalition to take advantage of opportunities anticipated to be developed under new state legislation (specifically, Assembly Bill 32 or AB 32). Assembly Bill 32 was adopted in 2006 requiring the state to reduce greenhouse gas (GHG) emissions to 1990 levels by 2020 (with further reductions by 2050). To achieve GHG reductions, the state created numerous programs incentivizing renewable energy and low carbon fuel production. This legislation served as a driver to prioritize the conversion of biosolids to energy for the BAB2E Coalition.

A decade later, Governor Brown announced five overarching "pillars" by which he plans to achieve the 2030 GHG reduction target under Senate Bill 32 (SB 32). These pillars recognize that several major areas of the California economy will need to reduce emissions.

1. Reducing today's petroleum use in cars and trucks by up to 50 percent
2. Increasing from 33 to 50 percent the procurement of electricity derived from renewable sources
3. Doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner
4. Reducing the release of methane, black carbon, and other short-lived climate pollutants
5. Managing farms, rangelands, forests and wetlands so they can store carbon

To enact these pillars, the Governor has recently signed legislation that either directly or indirectly impacts the disposal and use of wastewater treatment plant (WWTP) biosolids at landfills, as well as the diversion of other organic waste streams to WWTPs. In an effort to holistically address biosolids end use options, the BAB2E Coalition re-branded themselves as the Bay Area Biosolids Coalition in 2017. While the Coalition continues to be vigilant in identifying biosolids to energy opportunities, the Coalition has expanded its focus to biosolids end use options that manage additional nutrient loading and produce other value-added products to address the Governor's goals and associated regulations in support of GHG reductions statewide. The updated focus of the BAB Coalition continues to satisfy the Solano County Code requirements for land application of biosolids.

Over this past year, the Coalition has been evaluating biosolids management options with the intent of identifying three to six options that can be implemented within the next two to three

years and generate a product that can be beneficially used locally in all seasons of the year. The first step of the evaluation was an initial screening process completed in October 2017. The next phase is currently underway and includes further information gathering and discussions with specific technology providers that had passed the initial screening process. The Coalition continues to pursue a multi-pronged approach that includes:

- Investigating viable, year-long (weather resilient) alternatives to land application that look beyond "biosolids to energy" and seek to responsibly recycle back value-added products of biosolids to the environment.
- Educating the public on biosolids management issues in California through public outreach efforts, including the creation of a public website and securing media coverage.
- Serving as a technology incubator – particularly for pre-commercial technologies.
- Supporting land application in the Bay Area by seeking to create more capacity for biosolids in the Bay Area marketplace.
- Advancing the industry and legislative state of knowledge on biosolids as a valuable resource.

To achieve the Coalition objectives (listed above) and address critical challenges identified in the next two years, the Coalition will:

- **Build Relationships** - among members and local governments (e.g., Solano County), academia, legislature, state agencies, public, etc.
- **Achieve Project Maturity** - gaining experiences from the six existing subregional projects
- **Promote Product Development** - continuing to identify/develop technologies and other biosolids end use products that can be replicated by others

Current Coalition members are:

City of Millbrae	Ironhouse Sanitary District
City of Palo Alto	North San Mateo County Sanitation District
City of Santa Rosa	San Francisco Public Utilities Commission
Central Marin Sanitation Agency	Sausalito-Marín City Sanitary District
Delta Diablo	Union Sanitary District
Dublin San Ramon Services District	Vallejo Flood and Wastewater District
East Bay Municipal Utility District	West County Wastewater District
Fairfield-Suisun Sewer District	

## Individual Agency Programs

Individual BACWA agencies are responsible for their own biosolids management programs and each develops its own plan in addition to participating in regional programs. Below are program highlights for many of the participating agencies. Note that while Fairfield-Suisun Sewer District does not apply biosolids to agricultural land in the County, they are an active participant in both the BACWA Biosolids Committee and the BAB Coalition.

Several Bay Area agencies have initiated diverting their biosolids to the Lystek OMRC as an alternative end use. The OMRC conducts further biosolids processing by utilizing LysteGro technology to create a liquid bio-fertilizer Class A EQ product. Lystek's hydrolysis process simultaneously introduces high speed shearing, low pressure steam and alkali in an enclosed reactor to transform sludge into a liquid fertilizer. Lystek's land application program in Solano County began in spring 2017. The following agencies have conveyed their biosolids to Lystek: CMSA, City of Santa Rosa, City of South San Francisco (trial basis), City of Petaluma, EBMUD, Fairfield-Suisun Sewer District, Mt. View Sanitary District (trial basis), and SFPUC.

Many agencies that land applied Class B biosolids in Solano County either participated in the BAB Coalition and/or diverted a portion of their biosolids to Class A conversion facility (e.g., compost facility or Lystek OMRC).

**Central Marin Sanitation Agency.** CMSA contracted with Synagro for land application of its biosolids during the dry weather season in Sonoma and Solano counties. CMSA also sends its biosolids to Redwood Landfill for landfill beneficial use, to Synagro's Central Valley Compost facility, and to Lystek International for further processing to meet Class A biosolids requirements. CMSA now serves as the Bay Area Biosolids Coalition lead agency.

**City of Calistoga.** The City of Calistoga produces biosolids according to 40 CFR regulations. At this facility, solids are processed by the treatment methods of thickening and application to drying beds. The material is land applied to various fields in Solano County by Synagro, and a portion of this material is diverted to produce Class A Biosolids at Synagro's Central Valley Compost Site.

**Delta Diablo.** Delta Diablo produces Class B biosolids and contracts with Synagro for biosolids management. Over 90% of the biosolids are land applied in either Solano, Sacramento or Merced Counties. Delta Diablo is an active participant in the Bay Area Biosolids Coalition and continues to explore additional and alternative biosolids management options.

**East Bay Municipal Utility District.** EBMUD produces Class B biosolids, approximately half of which are used for alternative daily cover and half for land application. The majority of EBMUD's land applied biosolids were utilized in Merced County, with a small portion in Solano County. In addition, some biosolids were further processed at the Lystek OMRC and a small amount was disposed of at landfills.

**Ironhouse Sanitary District.** The Ironhouse Sanitary District (ISD) produces biosolids according to 40 CFR regulations. ISD's recycling facility is designed to produce Class B biosolids. In 2017, about 137 dry tons of ISD's biosolids were land applied to various fields in Solano County by Synagro.

**San Francisco Public Utilities Commission (Southeast and Oceanside WPCPs).** The Wastewater Enterprise (WWE) is one of three enterprises of the SFPUC. WWE marked its seventeenth

consecutive season of land application of Class B biosolids in Solano County. Inspectors from the WWE perform land application inspections in Solano County to ensure that the contractors are following local regulations. The WWE also contracts with Synagro to land apply Class B biosolids in Sacramento County and to divert biosolids to Synagro's Central Valley Compost Facility in Merced County to produce Class A compost material. During the wet-weather season, biosolids from both the Southeast and Oceanside WPCPs were beneficially used at Vasco Road, Potrero Hills, and Altamont Landfills and land applied at Silva Ranch in Sacramento County. In partnership with Lystek and the Fairfield-Sewer Suisun District, in 2017, WWE also diverted biosolids to the OMRC for the production of Class A EQ liquid fertilizer.

Construction was completed in July 2016 for the upgrade of the digestion process at the Oceanside WPCP to a Sequencing Batch Reactor Temperature-Phased Anaerobic Digestion (SBR TPAD) which will generate Class A biosolids. Thermophilic digestion in three digesters under batch mode was established in early 2017 and multiple process improvements have been installed throughout 2017. The WWE is also proceeding with its multi-billion dollar Sewer System Improvement Program <http://sfwater.org/index.aspx?page=116>, which includes a keystone project – complete reconstruction of the Southeast WPCP's biosolids processing facility. WWE Staff and its consultant team (Brown & Caldwell, CH2M, and Black & Veatch) have decided on thermal hydrolysis pretreatment prior to mesophilic digestion to achieve Class A biosolids from the SEP. Completion of the new facility is expected in 2023, followed by a transition period to conduct performance testing and facility commissioning, with full operation commencing in 2025.

The WWE continues to actively participate in the Bay Area Biosolids Coalition.

**Town of Windsor.** The Town of Windsor Water Reclamation Facility contracts with Synagro to land apply biosolids to farmland in Solano, Sonoma, and Sacramento Counties. As part of the Synagro contract, Synagro diverts a portion of its biosolids to its Merced County facility for composting. The Town of Windsor continues to investigate feasible and cost effective Class B biosolids treatment and process options.

**Union Sanitary District.** Union Sanitary District (USD) beneficially used most of its biosolids in 2017 and met all USEPA regulations for the 24<sup>th</sup> consecutive year. USD continues to contract with Synagro for its biosolids management, with approximately 60 percent of USD's biosolids land-applied to farmland in Sacramento, Merced and Solano Counties. From January 1 through November 9, 2017, approximately 11 percent of biosolids were sent to landfills in Merced, Solano, and Alameda Counties due to wet weather constraints for land application. Nearly 29 percent of biosolids production was delivered to Merced County for producing Class A compost. USD is one of 15 Bay Area wastewater utilities actively participating in the Bay Area Biosolids Coalition.