



**B A C W A**  
**B A Y A R E A**  
**C L E A N W A T E R**  
**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**

**February 2012**

## Introduction

The Bay Area Clean Water Agencies (BACWA) is pleased to present its annual summary report on application of Biosolids in Solano County. The report provides updated 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 and other efforts by individual agencies currently applying biosolids in the County. 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. The close of the application season for 2011 brings favorable results in terms of increased yield for farms receiving biosolids and minimal impacts on residents and the environment. There were no permit violations, no regulatory issues, and two minor complaints about the land application operations. In addition, preliminary data from the University of California at Davis indicates limited pollutant impacts on air, water and soil in the vicinity of the application operations. We look forward to seeing their final results.

This report 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 Regulations (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 Mr. Terry Schmidbauer and Mr. Jeffrey Bell.

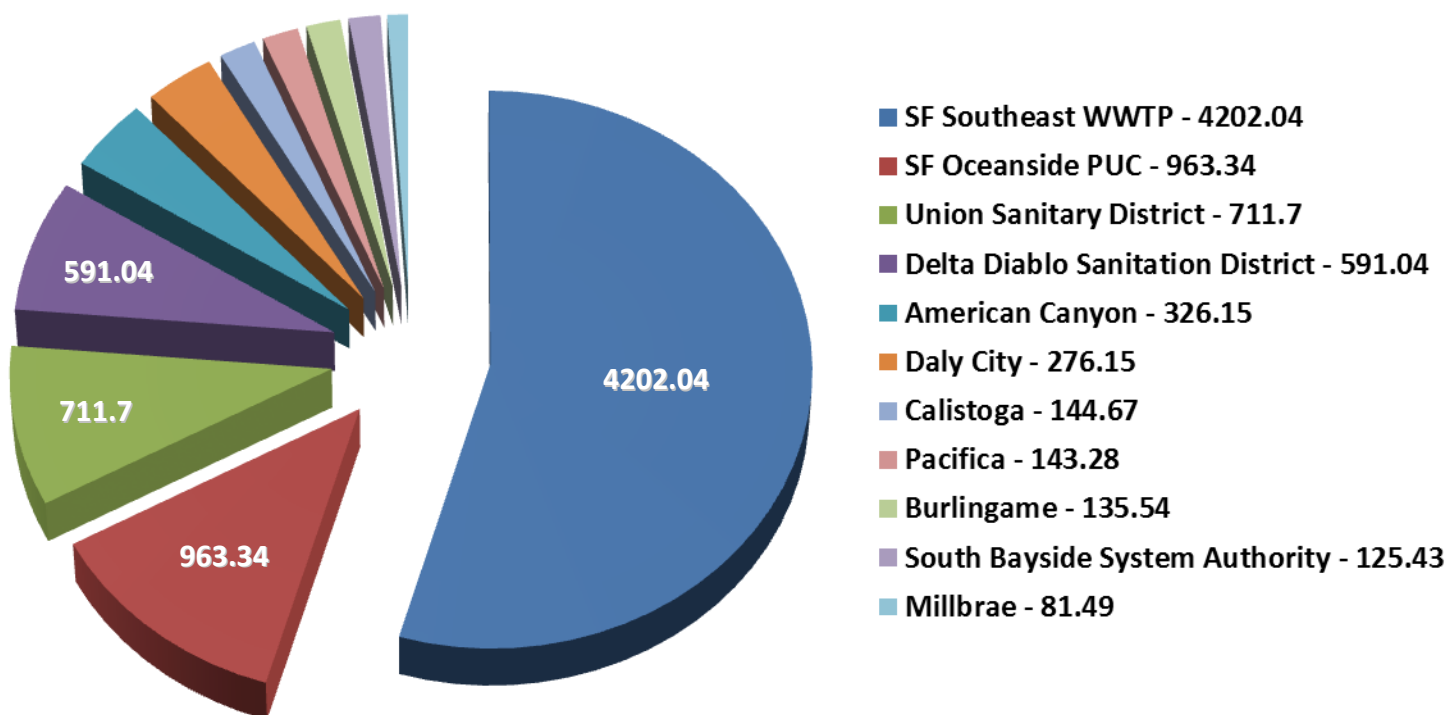
## Municipal Agencies Applying Biosolids in Solano County

The application of biosolids provides soil amendments and nutrients to enhance the productivity of the farm land using natural, recycled materials. Each agency that applies biosolids is required to meet strict standards and provides a report annually to the EPA to demonstrate compliance. Several Bay Area agencies currently transport biosolids to agricultural land in Solano County under contract with Synagro. These agencies include the following:

- The City of American Canyon
- The City of Burlingame
- The City of Calistoga
- The City of Daly City
- Delta Diablo Sanitary District (serving Antioch and Pittsburg)
- The City of Millbrae
- The City of Pacifica
- San Francisco City and County
- South Bay Side System Authority (serving Belmont, Redwood City and San Carlos)
- Union Sanitary District (serving Fremont, Newark and Union City)

Figure 1 illustrates the quantity of biosolids applied to Solano County agricultural sites in 2011 by each agency in dry tons per year. The total applied was 7,701 dry tons.

**Figure 1 – Biosolids Applied In Solano County**



*(Data provided by Synagro)*

From data provided by Solano County staff, the amount of biosolids applied in Solano County during the 2011 application season has returned to 2009 levels as anticipated. The prior year's reduced quantity was due to several factors including delays in implementing new contracts and confirmation of appropriate application rates on farms as imposed by the California State Water Board. Those issues are now resolved.

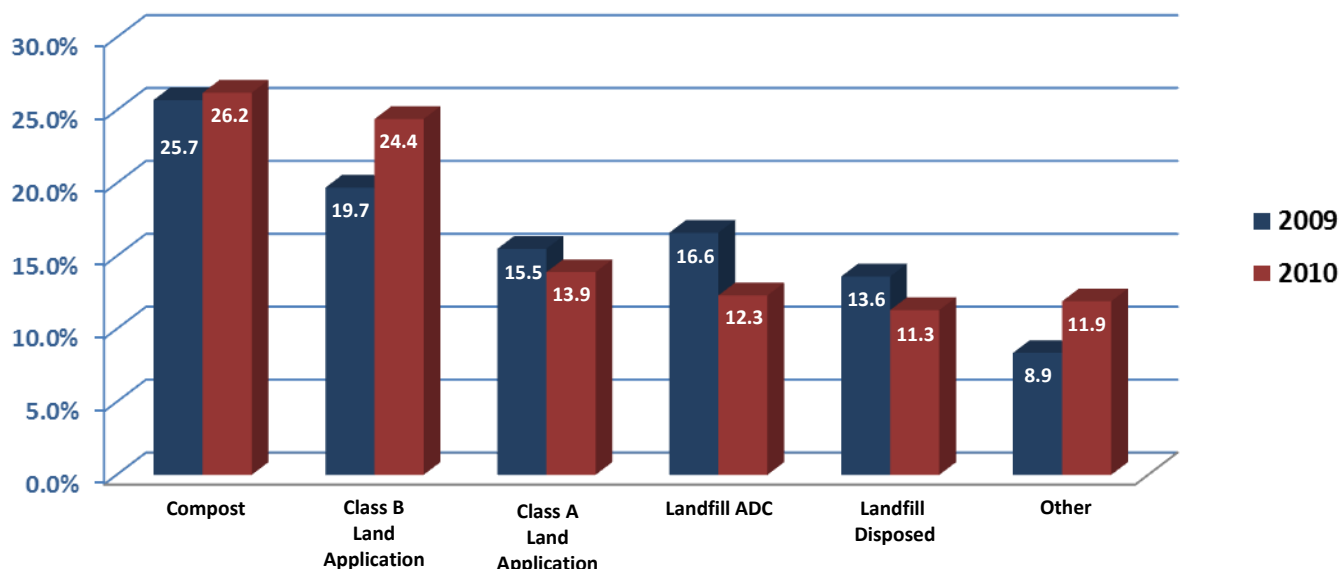
### **Trends in Biosolids Usage**

In general, municipal agencies in California are continuing to diversify the options for reuse, recycling and disposal of biosolids and are exploring available technologies for extracting energy and nutrients. Other efforts include development of processes for production of Class A biosolids.

### California Trends

Figure 2 summarizes the use of biosolids in California for Calendar Year 2010 and 2009. The number one use statewide is land application in various forms, including compost, Class B and Class A applications. 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 reuse and disposal include alternate daily cover for landfill and landfill disposal.

**Figure 2 – California Trends In Biosolid Use**



*“Other” Includes Surface Disposal (3.8%), Incineration (3.5%), Cement Kiln Fuel (3.1%) - year 2010*

*(Data provided by EPA Region 9)*

Recent biosolids management projects of interest in California include the following:

**Terminal Island Renewable Energy Project.** The City of Los Angeles, in collaboration with the EPA, successfully completed a two year demonstration of a deep well injection project. Near their Terminal Island treatment plant site, the City injected biosolids one mile below the surface into depleted oil formations. The natural high temperatures in those formations help to breakdown the biosolids and produce methane gas. The project has been in operation since 2008 and is ready to proceed to the next phase at expanded capacity.

**Biosolids to Biodiesel Project.** The Los Angeles County Sanitation District has been evaluating a pilot scale project to convert biosolids to clean diesel fuel using a combination of high temperature pyrolysis and reformation technology. The Bay Area Biosolids to Energy Coalition is planning a tour of this facility to view the project and assess potential viability.

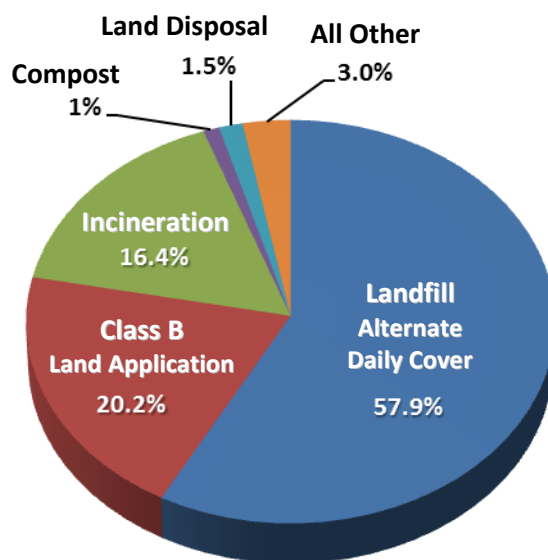
**Biosolids Alternate Fuel.** The Encina Wastewater Authority in Carlsbad California is now producing dried biosolids pellets from a heat dryer and selling them to a cement kiln as an alternative fuel to coal.

**New Compost Facility Under Construction.** Los Angeles County Sanitation District is constructing a large aerated static pile compost facility in Kings County. The facility, which will compost biosolids and green waste to produce a soil amendment, is scheduled for completion in 2013. The compost will be used to rehabilitate depleted agricultural land at this south San Joaquin Valley site. The facility will be able to handle about 500,000 tons of biosolids annually.

### Bay Area Trends

In focusing on the Bay Area, Figure 3 illustrates uses of biosolids in the nine Bay Area counties. The primary uses are alternate daily cover for landfill, land application and incineration.

**Figure 3 – Bay Area Agency Biosolids Uses – 2010**

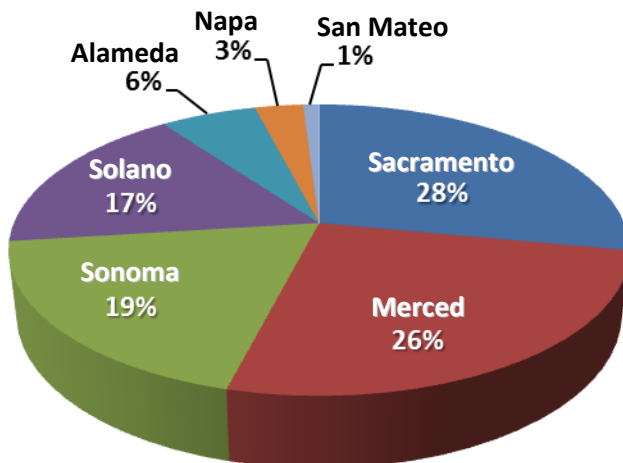


*(Data Provided by EPA Region 9)*

In 2010, biosolids produced in the Bay Area were ultimately distributed to landfills and land application sites among each of 10 counties. Santa Clara county received the largest share at 34%, with Solano, Alameda and Contra Costa County each receiving between 10-20% of the total.

Biosolids were applied to agricultural land in 7 different counties with Solano County ranking 4<sup>th</sup>, receiving approximately 17% of the biosolids produced. Figure 4 illustrates the distribution of land applied biosolids among the various counties.

**Figure 4 – Land Application Among Counties**



*(Data provided by EPA Region 9)*

Total biosolids exported to Solano County were divided between landfill cover and agricultural land application. Approximately 78% were placed on landfill and 22% were land applied.

### **Bay Area Regional Efforts**

**BACWA Biosolids Committee.** The Biosolids Committee provides proactive support and information sharing to member agencies on regional biosolids issues, projects, and proposed regulations and legislation. This includes support for the development and maintenance of cost-effective, sustainable biosolids management options for the more than 158,000 dry metric tons of biosolids produced in the Bay Area annually. The Committee helps evaluate emerging technologies and provides guidance on best practices in the industry.

**Bay Area Biosolids to Energy Coalition.** A sixteen member consortium of Bay Area agencies charged with wastewater treatment is developing a Biosolids to Energy project to address biosolids management issues affecting agencies and their rate payers around the San Francisco Bay Area. The Coalition project goals are to maximize the renewable energy potential in biosolids and minimize greenhouse gas emissions, while diversifying biosolids management options to include alternatives that will not be dependent on agricultural use of the biosolids, or the need to send biosolids to landfills. The project is aligned with state and federal initiatives to develop renewable energy resources and reduce greenhouse gas emissions. Local, state and federal partnerships involving both public and private organizations are essential for the success of the project.

### **History**

In 2004, members of the Bay Area Clean Water Agencies (BACWA) began evaluating alternative Biosolids management options to address initiatives, opportunities and challenges related to increasing restrictions on the limited biosolids management options available to the San Francisco Bay Area. After examining over 35 biosolids processing options, the studies concluded a regional drying facility was the most feasible option. While potentially costing 3-4 times other options in place at the time, it could provide the needed diversity for biosolids end use. In 2007, seven agencies formed a Joint Exercise of Powers Authority (JEPA), to pursue the next phase of the regional project.

Prompted by the passage of AB 32, the agencies re-visited the alternative of using Bay Area biosolids to produce renewable energy and are now focused on a biosolids to energy approach. *The goal: to create a local, land-air-water friendly biosolids management option within the Bay Area aligned with greenhouse gas reduction and renewable energy goals.* Additional agencies subsequently signed on to the JEPA to form the *BAB2E Coalition*. Together these agencies transport biosolids over 800,000 miles annually; reduction in vehicle miles associated with this hauling is an expected benefit of the regional project.

The Coalition issued a Request for Qualifications and received Statements of Qualifications from 16 teams from around the world proposing various biosolids to energy technologies. The Coalition short-listed three teams to further qualify to build a BAB2E facility in the nine-county Bay Area. The short listed firms were:

- **Intellergy** for a plant that would utilize a steam/CO2 reforming process to produce hydrogen gas for direct use or in combination with fuel cells to produce electricity.
- **MaxWest** for a gasification facility that utilizes a gasifier, recycling heat into the process and producing additional heat for on-site use.
- **Synagro** for a dryer that would use waste heat from engines fueled by landfill methane gas to dry biosolids, then use the dried biosolids as a renewable fuel in a biomass to energy plant.

The three short-listed technologies provide a range of technology options and innovative approaches, and include non-incineration processes.

While biosolids have great energy potential, the field has been evolving to meet the associated challenges. Nationwide, only a handful of projects are underway and estimated costs are quite high. Some projects have been unable to overcome operational difficulties associated with handling the biosolids. To date there has been no clear “best technology” that has demonstrated the ability to efficiently extract energy from biosolids on a sustainable, large scale basis. The Coalition has sought to develop partnerships and support, both regulatory and



financial, for a regional biosolids to energy alternative. Over the last 2 years, the Coalition has met with state and federal elected officials and agency representatives from the Air Resources Board, CalEPA and CalRecycle (formerly the Integrated Waste Management Board) and the California Energy Commission. Administration officials have been receptive to the goals of the project. Similarly, state and federal representatives have been supportive of funding requests. To further evaluate one promising technology, the Coalition worked with the California Energy Commission and received a \$1million grant to help fund a demonstration project for one of the proposed technologies. The demonstration project is in the planning stages and hoped to be underway later this year, if private funding can be secured.

In addition, the Coalition participated in a public workshop with Alameda County's Waste Management Authority (StopWaste.Org) to engage interested groups and individuals on organics management options. The workshop helped raise awareness and gather opinions about currently available biosolids management options. The input received was supportive of both biosolids to energy options and agricultural and horticultural options for using biosolids. The message was also clear that the public wanted to be assured that options were safe, did not impact public health and truly could produce clean energy.

**Current Status**

The Coalition is in the process of establishing a governance structure suited to contracting for the regional facility and defining agency commitments of biosolids for the regional facility. New members are in the process of joining the coalition and include the Cities of San Jose and Santa Rosa. The group is also preparing to issue a Request for Proposals for development of a merchant owned facility utilizing biosolids committed to the project from each coalition member. The Coalition continues work to secure grants from the California Energy Commission and U.S. Department of Energy. The grants may be utilized to continue research or assist with funding a public/private partnership to develop a full scale project. The current coalition members are:

- |  |  |
|--|--|
| San Francisco Public Utilities Commission  | Dublin San Ramon Services District     |
| City of Burlingame                         | Fairfield-Suisun Sewer District        |
| City of Livermore                          | Ironhouse Sanitary District            |
| City of Richmond                           | Sausalito Marin City Sanitary District |
| North San Mateo County Sanitation District | South Bayside System Authority         |
| West County Wastewater District            | Union Sanitary District                |
| Central Marin Sanitation Agency            | City of Millbrae                       |
| Delta Diablo Sanitation District           | Vallejo Sanitation District            |

We will continue to keep the County Department of Resource Management staff informed of the progress of the program.



## 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 Bay Area Biosolids to Energy Coalition.

**San Francisco PUC.** The San Francisco Public Utilities Commission (SFPUC) – Wastewater Enterprise marked its twelfth consecutive season of land application of Class B biosolids in Solano County. Inspectors from the SFPUC make monthly trips up to Solano County to ensure that our contractors are following these local regulations. In addition to Solano County, the SFPUC also land applies Class B biosolids in Sonoma County. As of June 2011, the SFPUC entered into a three-year contract with Synagro to divert 5,000 and 10,000 wet tons/year to Synagro’s Central Valley Compost Facility in Merced County. Currently the SFPUC is diverting approximately 8.5% of the total biosolids to this Class A option. During the wet-weather season (October 15 – April 15), the biosolids from both plants are stored in a lined storage area at Hay Road in Dixon landfill for beneficial use at the landfill facility during the next dry-weather season.

The SFPUC continues to actively participate in the Bay Area Biosolids to Energy Coalition. Designs are being finalized for upgrading the digestion process at the Oceanside Water Pollution Control Plant to a two-stage thermophilic/mesophilic process known as TPAD that will generate Class A Biosolids as defined by the 40CFR503 regulations. The SFPUC is proceeding with its multi-billion Sewer System Improvement Program <http://sfwater.org/index.aspx?page=116> that includes as one of the keystone projects a complete rehabilitation/reconstruction of the Southeast Water Pollution Control Plant’s Biosolids processing facility. While the final design is some years off, one of the levels of service that was endorsed by the SFPUC Commissioners is to achieve economic and environmental sustainability by continuing to reuse 100% of biosolids. To achieve this goal, the new facility will be designed to produce 100% Class A biosolids. The estimated cost is between \$1.4 and \$2.0 billion.

**American Canyon.** The City of American Canyon has a ten year holding capacity for biosolids. The City contracted with Synagro to remove biosolids for the first time in 2011. The biosolids were land applied to pastures in Solano County. The City may not remove or land apply biosolids in 2012, but is evaluating options for future removal and application of biosolids.

**Burlingame.** The City of Burlingame Wastewater Treatment Facility continues to contract with Synagro to land apply biosolids. The facility is currently diverting approximately 10 to 15% of its biosolids to Merced County for composting and will continue to incrementally increase the amount diverted each year. The City of Burlingame continues to participate in the Bay Area Biosolids to Energy Coalition (BAB2E). In January 2012, we will install a new centrifuge to increase the percent solids production of our biosolids. The centrifuge process will assist the

City of Burlingame in achieving a possible minimum requirement for % solids to the BAB2E facility in the future.

**Delta Diablo Sanitation District (DDSD).** The District continues to lead and actively participate in the Bay Area Biosolids to Energy Coalition. DDSD contracts with Synagro to land apply biosolids to farm land in both Sacramento and Solano Counties. In 2011 DDSD diverted approximately 7% of its biosolids to Merced County for composting and has contract provisions to incrementally increase the amount diverted each year by mutual agreement.

**Millbrae.** In 2011 the City of Millbrae continued to contract with Synagro West Inc. for the beneficial reuse of the City's dewatered biosolids as either soil amendment or ADC (Alternative Daily Cover). The city has continued to augment digester feedstock and has sustained at least a 20% reduction in the amount/weight of biosolids that require dewatering over the past several years. The city is also an active participant in the BAB2E coalition to find long term sustainable biosolids reuse for energy extraction.

**South Bayside System Authority (SBSA).** SBSA continues to contract with Synagro to land apply biosolids to farm land in both Sacramento and Solano Counties. SBSA is currently diverting approximately 10 to 15% of its biosolids to Merced County for composting and will continue to incrementally increase the amount diverted each year. The Authority continues to actively participate in the Bay Area Biosolids to Energy Coalition. SBSA also maintains the option of sending biosolids to landfill if needed.

**Union Sanitary District.** Union Sanitary District continues to contract with Synagro to land apply biosolids to farm land in both Sacramento and Solano Counties. USD is currently diverting approximately 20 to 25% of its biosolids to Merced County for composting and will continue to incrementally increase the amount diverted each year. The District continues to actively participate in the Bay Area Biosolids to Energy Coalition. In FY13, USD will be conducting a study to further evaluate available biosolids reuse and disposal options for future planning purposes.

The Bay Area Clean Water Agency appreciates the opportunity to present this report for your consideration and will work with staff to address any questions you may have regarding the above information.