



EAST BAY DISCHARGERS AUTHORITY
2651 Grant Avenue
San Lorenzo, CA 94580-1841
(510) 278-5910
FAX (510) 278-6547

A Joint Powers Public Agency

NOTICE: In compliance with AB 361 (2021), the Financial Management Committee meeting scheduled below will be accessible via Zoom video conferencing. Members of the public may participate in the meeting through the Zoom link or phone number below.

- Zoom link: <https://us02web.zoom.us/j/86260440932>
- Telephone dial-in: 1(669) 900-6833, meeting ID #862 6044 0932

ITEM NO. 11

REGULATORY AFFAIRS COMMITTEE AGENDA

Monday, January 24, 2022

11:00 A.M.

**East Bay Dischargers Authority
2651 Grant Avenue, San Lorenzo, CA 94580**

Committee Members: Cutter (Chair); Johnson

RA1. Call to Order

RA2. Roll Call

RA3. Public Forum

RA4. EBDA NPDES Compliance – See Item OM4
(The Committee will review NPDES Permit compliance data.)

RA5. Reporting Checklist
(The Committee will review a checklist of completed regulatory reporting items.)

RA6. Biosolids Regional Trends Report and EBDA Planning Update
(The Committee will review a recent report published by the Bay Area Clean Water Agencies and receive an update on EBDA planning efforts.)

RA7. Adjournment

Any member of the public may address the Committee at the commencement of the meeting on any matter within the jurisdiction of the Committee. This should not relate to any item on the agenda. Each person addressing the Committee should limit their presentation to three minutes. Non-English speakers using a translator will have a time limit of six minutes. Any member of the public desiring to provide comments to the Committee on any agenda item should do so at the time the item is considered. Oral comments should be limited to three minutes per individual or ten minutes for an organization. Speaker's cards will be available and are to be completed prior to speaking.

Agenda Explanation
East Bay Dischargers Authority
Regulatory Affairs Committee
January 24, 2022

In compliance with the Americans with Disabilities Act of 1990, if you need special assistance to participate in an Authority meeting, or you need a copy of the agenda, or the agenda packet, in an appropriate alternative format, please contact the Administration Manager at (510) 278-5910 or juanita@ebda.org. Notification of at least 48 hours prior to the meeting or time when services are needed will assist the Authority staff in assuring that reasonable arrangements can be made to provide accessibility to the meeting or service.

In compliance with SB 343, related writings of open session items are available for public inspection at East Bay Dischargers Authority, 2651 Grant Avenue, San Lorenzo, CA 94580. For your convenience, agenda items are also posted on the East Bay Dischargers Authority website located at <http://www.ebda.org>.

<p>The next Regulatory Affairs Committee meeting is scheduled on Monday, March 14, 2022 at 9:00 a.m.</p>

ITEM NO. RA5 REPORTING CHECKLIST

Recommendation

For the Committee's information only; no action is required.

Background

Authority staff maintains a checklist of all regulatory reporting and related tasks to ensure timely and complete reporting.

Discussion

The following checklist is extracted from a complete list of routine regulatory activities addressed throughout the year. The following items were completed during the period of September 1 through December 31, 2021; there are no outstanding activities.

<i>Authority</i>	<i>Required Action</i>	<i>Occurrence</i>	<i>Date</i>
			<i>Submitted</i>
Department of Industrial Relations	Federal & State employment law postings	Annual	9/1/2021
Bay Area Air Quality Management District	Renew <i>Permit to Operate</i> Plant #14528	Annual	9/1/2021
Bay Area Air Quality Management District	Pay renewal fee for <i>Permit to Operate</i> Plant #14528	Annual	9/15/2021
Alliant Insurance Services, Inc	CSRMA Pooled Liability Program Renewal Questionnaire	Annual	9/17/2021
ADP Business Payroll	Print Payroll Quarter-End Tax Returns	Quarterly	10/27/2021
State Water Resources Control Board	NPDES Quarterly Report (Jul-Sep)	Quarterly	10/30/2021
Various	EE Training (See: Log EE_Training)	Monthly	11/22/2021
Bureau of Labor Statistics	Report monthly employment figures	Monthly	12/13/2021
Regional Water Quality Control Board	Skywest Recycled Water monthly reports	Monthly	12/22/2021
Alameda County	Financial Statements Submittal	Annual	12/22/2021
Various	Financial Statements Submittal	Annual	12/22/2021
State Controller	Financial Statements Submittal	Annual	12/22/2021
State Water Resources Control Board	NPDES monthly reports	Monthly	12/30/2021

ITEM NO. RA6 BIOSOLIDS REGIONAL TRENDS REPORT AND EBDA PLANNING UPDATE

Recommendation

For the Committee's information only; no action is required.

Background

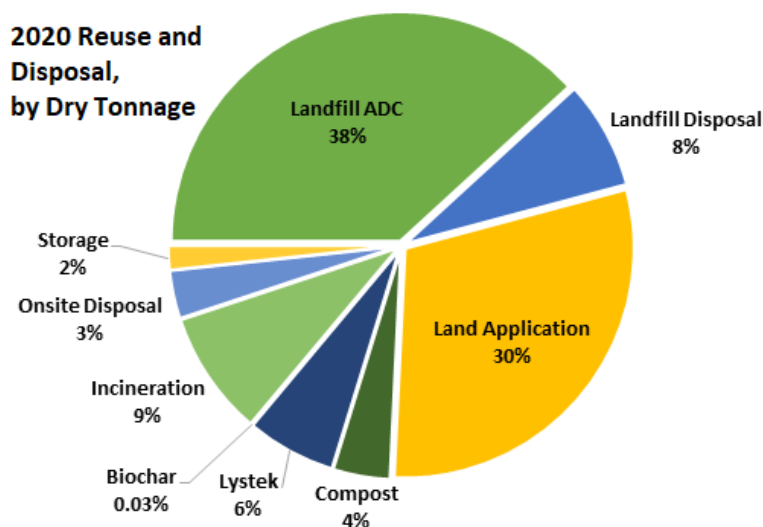
Every few years, the Bay Area Clean Water Agencies (BACWA) performs a regional survey of biosolids management practices at Bay Area wastewater agencies to assess trends, challenges, and opportunities. The survey was most recently performed in 2021, regarding 2020 practices. The resulting report, attached for reference, provides interesting insights about the status and future of biosolids management.

Discussion

The intent of this survey was to identify current industry trends for the following issues:

- Biosolids production volumes
- Treatment and dewatering technologies
- End use and disposal options
- Hauling and tipping costs
- Agency challenges
- Compliance with California's Short-Lived Climate Pollutants Reduction Strategy (SB-1383)
- Marketing and public outreach

As shown in the following graphic (from page 10 of the Report), regionally, the most common biosolids end use in 2020 continued to be use as alternative daily cover (ADC) at landfills.



legislation aimed at reducing short-lived climate pollutants such as methane. Many Bay Area agencies rely on ADC particularly during the wet weather season, when land application to growing fields is not permitted. Those agencies must now diversify their biosolids management strategies to find outlets to replace ADC. As such, the trend is away from ADC and toward agricultural land application, compost, and higher end processing technologies such as Lystek, which converts biosolids to a liquid fertilizer. See the figure below illustrating these trends.

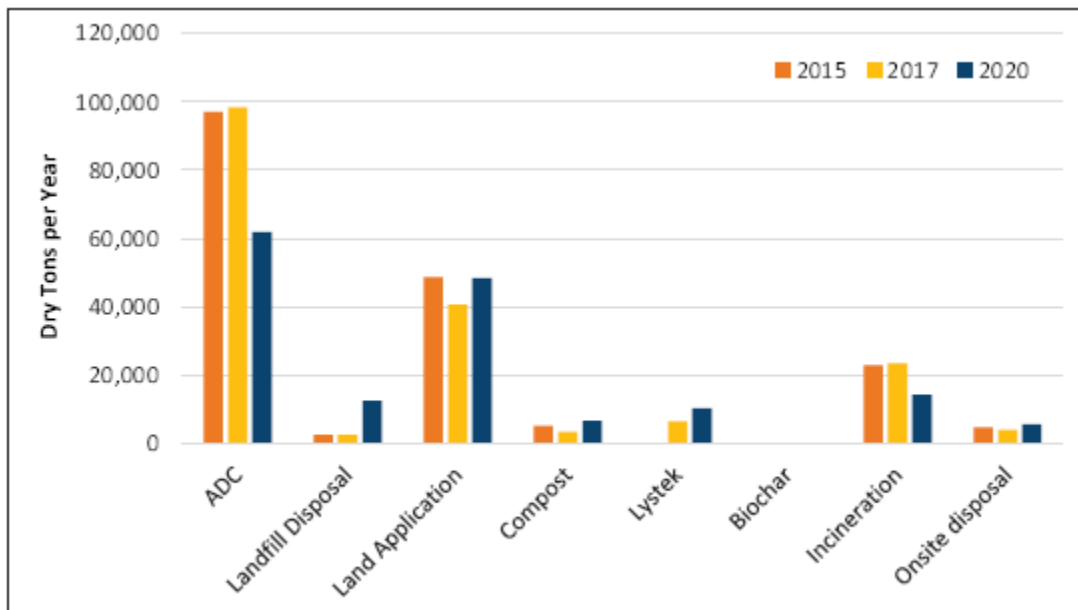
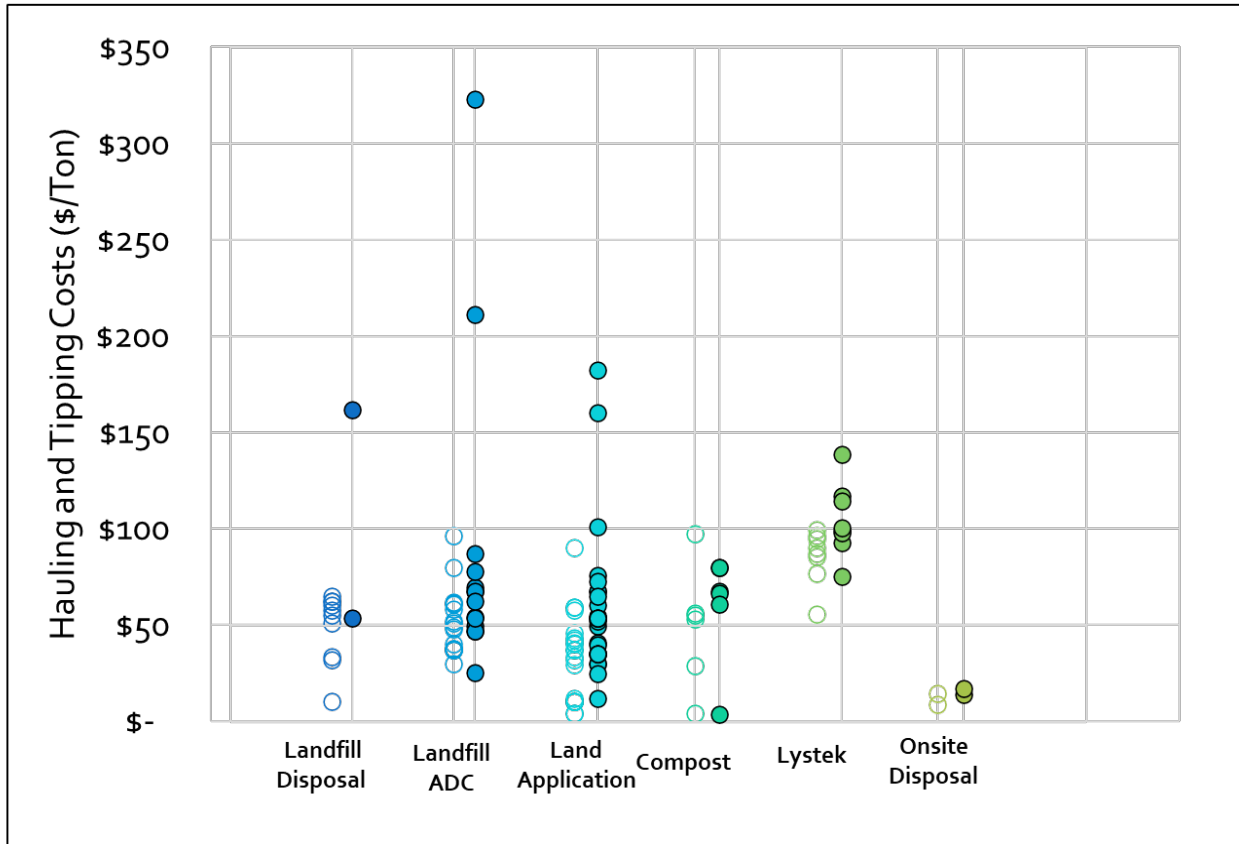


Figure 7. Dry tonnage of biosolids per reuse and disposal method, 2015 to 2020.

As a result of SB 1383 implementation and the shift from ADC to land application, Bay Area biosolids hauling and reuse/disposal costs have begun to rise sharply. In the three years since the prior survey, the median price for ADC increased by 36% - twice the rate of inflation over that period. The median price for land application increased by 64% over the three-year period. The figure below shows prices individual agencies across the Bay pay for hauling and tipping at various outlets, with the open circles representing 2017 values and the solid circles representing 2020 values.



Several of EBDA's Member Agencies are in the fortunate position of having dedicated drying beds, which allow flexibility for storage of biosolids during the wet season and land application during the dry season. That said, competition for land application and other end use outlets is expected to increase as agencies continue to migrate from ADC, and therefore prices for biosolids management are likely to continue to rise in the coming years.

While EBDA has historically focused primarily on water quality and effluent management, our existing governance provides an opportunity for potential collaboration on biosolids management to create economies of scale. Working with the MAC, and utilizing information gathered through the BACWA survey, staff issued the attached EBDA Biosolids Primer on December 13, 2021. The document was distributed to seven companies that have expressed interest in potential partnerships with EBDA and its members for biosolids management. Staff hopes to schedule meetings with interested companies in late January and February, with a goal of understanding whether some type of public-private partnership would be feasible and cost-effective. If opportunities are identified, staff will work with the MAC and the Commission to outline a procurement process.

Agenda Explanation
East Bay Dischargers Authority
Regulatory Affairs Committee
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At the same time, several members are participating in the regional Bay Area Biosolids Coalition, which continues to evaluate collaborative strategies region-wide for biosolids management and to evaluate new technologies. EBDA staff is also continuing to track opportunities for creative reuse of biosolids to address other emerging issues, including reclamation of land impacted by fires, and as fill for wetland remediation or horizontal levee construction. The latter represents significant opportunity, but implementation would require overcoming regulatory and public perception challenges.



Bay Area Clean Water Agencies

2021 Biosolids Trends Survey Report



Photo: Upgraded Digesters for Temperature Phased Anaerobic Digestion at San José-Santa Clara Treatment Plant. Source: [City of San José](#).

December 28, 2021

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1. Introduction

Biosolids management programs at Publicly Owned Treatment Works (POTWs) in the San Francisco Bay Region continue to be challenged by rapidly rising costs and a complex regulatory environment. Biosolids programs are affected by changes to solid waste disposal, air quality, and water quality regulations. From the solid waste disposal side, legislation and regulation aimed at diverting organic material from landfills will phase out landfill burial and Alternative Daily Cover (ADC) beginning January 1, 2022. The California Association of Sanitation Agencies' (CASA's) *Summary of SB 1383 and its Implementation*¹ outlines the regulatory challenges facing biosolids reuse and management alternatives for California agencies. Diverting food waste and biosolids from landfills will require greater on-site production and use of biogas, increased land application of treated biosolids, and deployment of new technologies.

Bay Area Clean Water Agencies (BACWA) is a joint powers agency whose members own and operate POTWs and sanitary sewer systems that collectively provide sanitary services to over 7.1 million people in the nine-county San Francisco Bay Area (Bay Area). In summer 2021, BACWA distributed a survey² to its member agencies to better understand the state of the biosolids treatment, disposal, and reuse in the Bay Area. The survey is a repeat of previous surveys conducted in 2016³ and 2018⁴. The intent of this survey was to quantify specific biosolids information and track industry trends for the following issues:

- *Biosolids production volumes*
- *Treatment and dewatering technologies*
- *End use and disposal options*
- *Biosolids management technologies and destination*
- *Hauling and tipping costs*
- *Agency challenges*
- *Strategies for SB 1383 compliance*
- *Marketing and public outreach*

The Survey includes responses from the following 31 agencies, representing more than 95 percent of the total flow of BACWA member agencies, plus the City of Santa Rosa (which is not a BACWA member):

- | | |
|--|---------------------|
| • Central Contra Costa Sanitary District | • City of Benicia |
| • Central Marin Sanitation Agency | • City of Hayward |
| • City of American Canyon | • City of Livermore |
| | • City of Millbrae |

¹ <https://bacwa.org/wp-content/uploads/2020/11/SB-1383-and-its-Implementation-CASA-2020.pdf>

² <https://bacwa.org/wp-content/uploads/2021/07/Biosolids-Survey-2021-Nonfillable-PDF-Version.pdf>

³ <https://bacwa.org/wp-content/uploads/2017/08/BACWA-2016-Biosolids-survey-report-1.pdf>

⁴ <https://bacwa.org/wp-content/uploads/2020/12/9-BACWA-2018-Biosolids-Survey-Report-Final-2020-12-10.pdf>

- City of Palo Alto
- City of Petaluma
- City of San Jose
- City of San Leandro
- City of San Mateo
- City of Santa Rosa
- City of South San Francisco - San Bruno Water Quality Control Plant
- City of Sunnyvale
- Delta Diablo
- Dublin San Ramon Services District
- East Bay Municipal Utility District
- Fairfield-Suisun Sewer District
- Las Gallinas Valley Sanitary District
- Mt. View Sanitary District
- Napa Sanitation District
- Novato Sanitary District
- Oro Loma Sanitary District
- San Francisco Public Utilities Commission
- Sewer Authority Mid-Coastside
- Sewerage Agency of Southern Marin
- Silicon Valley Clean Water
- Union Sanitary District
- Vallejo Flood & Wastewater District
- West County Wastewater District

The list of respondents above is the same as a prior version of this survey conducted in 2016 and 2018. The body of the report summarizes the data provided by agencies, while data on reuse and disposal destinations is presented in full in **Appendix A**. It is BACWA's intention to conduct this survey every 2-3 years. Agency responses will be used as part of a regional conversation about the future of biosolids management in Northern California, to identify regional needs, and to support efforts to identify and develop additional sustainable biosolids reuse alternatives. The survey was coordinated with the Southern California Alliance of Publicly Owned Treatment Works (SCAP) Biosolids Trends Survey⁵ and allows data comparisons between northern and southern California agencies.

BACWA wishes to thank all agencies that took the time and effort to assist with the production of this survey and report.

2. Treatment Technology

Survey respondents reported the technology used to produce and treat biosolids at each facility. Most facilities (26 out of 31 respondents) use mesophilic anaerobic digestion, as shown below in **Figure 1**. Many facilities reported using more than one method of treatment, including both on-site treatment and treatment that occurs after hauling to another facility, as noted below:

- City of San Jose uses mesophilic anaerobic digestion, lagoon stabilization, and air drying.
- East Bay Municipal Utility District and San Francisco Public Utilities Commission operate both thermophilic and mesophilic digestion.

⁵ SCAP Biosolids Trends Survey https://bacwa.org/wp-content/uploads/2020/11/2018_SCAP_BIOSOLIDS_BIENNIAL-2020_01_14-FINALv3.pdf

- West County Wastewater District, Sunnyvale, and Dublin San Ramon Services District use mesophilic anaerobic digestion followed by pond or lagoon stabilization.
- Oro Loma Sanitary District, City of Hayward, City of San Leandro, and Silicon Valley Clean Water reported use of air drying following anaerobic digestion.
- 9 facilities reported hauling to another facility for further treatment by Thermal Hydrolysis (i.e., Lystek). This is an increase over the 6 facilities that reported hauling to Lystek in the 2018 survey.
- 6 facilities reported hauling to another facility for further treatment via composting.

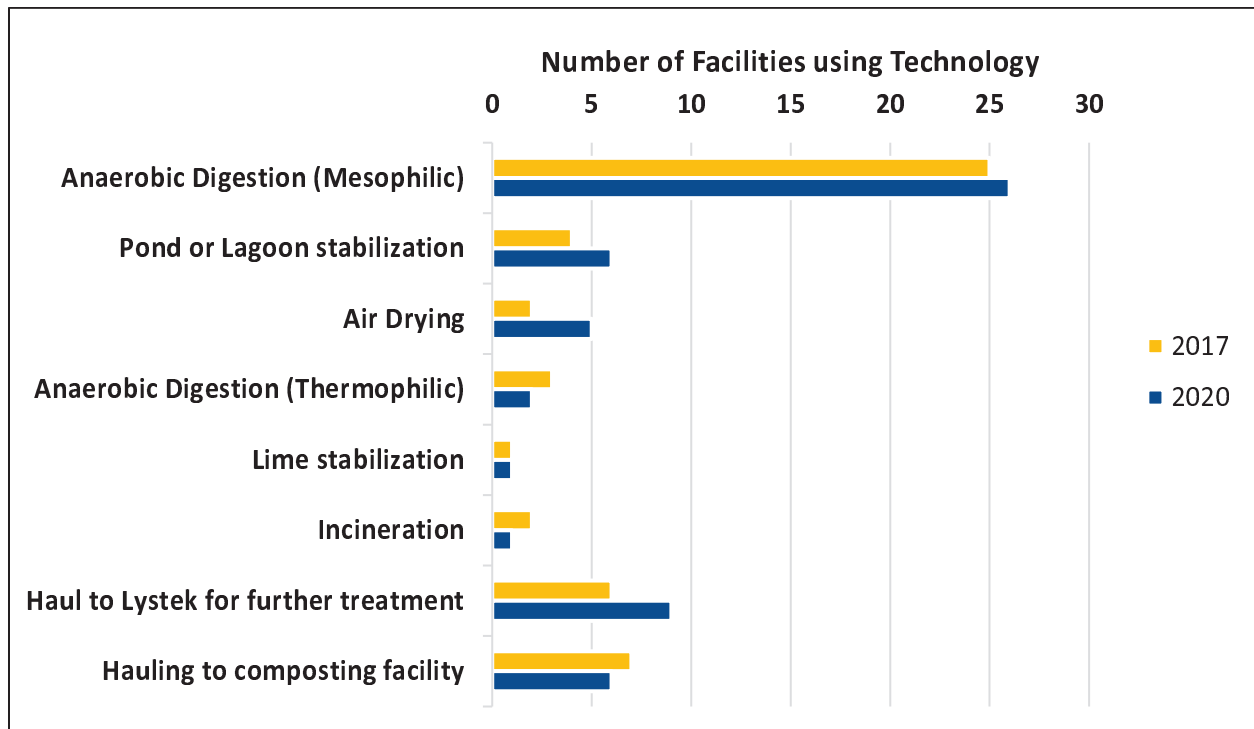


Figure 1. Technology used for biosolids production and management by survey respondents.

Compared to 2017, the 2020 survey showed slight changes in the number of agencies using mesophilic and thermophilic anaerobic digestion, pond and lagoon stabilization, and air drying. These adjustments appear to be related to changes in the survey responses, rather than being tied to actual facility changes.

3. Annual Biosolids Production

Survey respondents reported their biosolids production for the 2018, 2019, and 2020 calendar years. **Table 1** lists the type of biosolids produced by each agency, based on the classifications defined by EPA Rule 503⁶. Solids designated as EQ are “Exceptional Quality” biosolids, and “Other Quality” solids do not need to meet the 503 Rules, due to their final disposition. **Figure 2** and **Figure 3** compare the total tonnage of wet and dry tons, respectively. The dry tonnage reported in Figure 3 for 2018 and 2019 assumes that percent solids were approximately the same as 2020.

About half of the biosolids produced in the San Francisco Bay Region are Class B, while Class A accounts for about 40% of production. Production of Class A biosolids dropped dramatically in 2016 and 2017, but has since rebounded. There are two principal reasons for this trend. First, Dublin San Ramon Services District reported that their treated biosolids are Class A in this survey, but they were tracked as “other” in the survey covering 2016 and 2017. Second, the City of San Jose temporarily ceased testing its biosolids to demonstrate that they meet Class A quality. Testing was ceased because their biosolids were not going to Class A re-use and the cost of the additional testing was providing no tangible benefits. San Jose resumed testing in 2018. For both Dublin San Ramon Services District and San Jose, the solids were the same quality throughout this period, despite changes in classification.

Table 1. Classes of biosolids produced by respondents

Agency	Biosolids Class
American Canyon, City of	B
Benicia, City of	B
Central Contra Costa Sanitary District	Other (Incineration)
Central Marin Sanitation Agency	B
Delta Diablo	B
Dublin San Ramon Services District	A
East Bay Municipal Utility District	B
Fairfield-Suisun Sewer District	A
Hayward, City of	A
Las Gallinas Valley Sanitary District	B
Livermore, City of	B
Millbrae, City of	B
Mt. View Sanitary District	B
Napa Sanitation District	B
Novato Sanitary District	B
Oro Loma Sanitary District	A (in 2020) and B (in 2018, 2019)

⁶See the “Plain English Guide to the EPA Part 503 Biosolids Rule” at https://www.epa.gov/sites/production/files/2015-05/documents/a_plain_english_guide_to_the_epa_part_503_biosolids_rule.pdf

BACWA 2021 Biosolids Trends Survey

Agency	Biosolids Class
Palo Alto, City of	Other (Incineration in 2018 and 2019, then off-site treatment to Class A in 2020)
Petaluma, City of	B
San Francisco Public Utilities Commission	B
San Jose, City of	A ^a
San Leandro, City of	A and B
San Mateo, City of	B
Santa Rosa, City of	B
Sewer Authority Mid-Coastside	B
Sewerage Agency of Southern Marin	B
Silicon Valley Clean Water	B
South San Francisco - San Bruno WQCP, City of	B
Sunnyvale, City of	B
Union Sanitary District	B
Vallejo Flood & Wastewater District	B
West County Wastewater District	B

^a In 2018, City of San Jose biosolids were reported as Class B because pathogen testing was not performed. Testing to demonstrate Class A quality resumed in 2019.

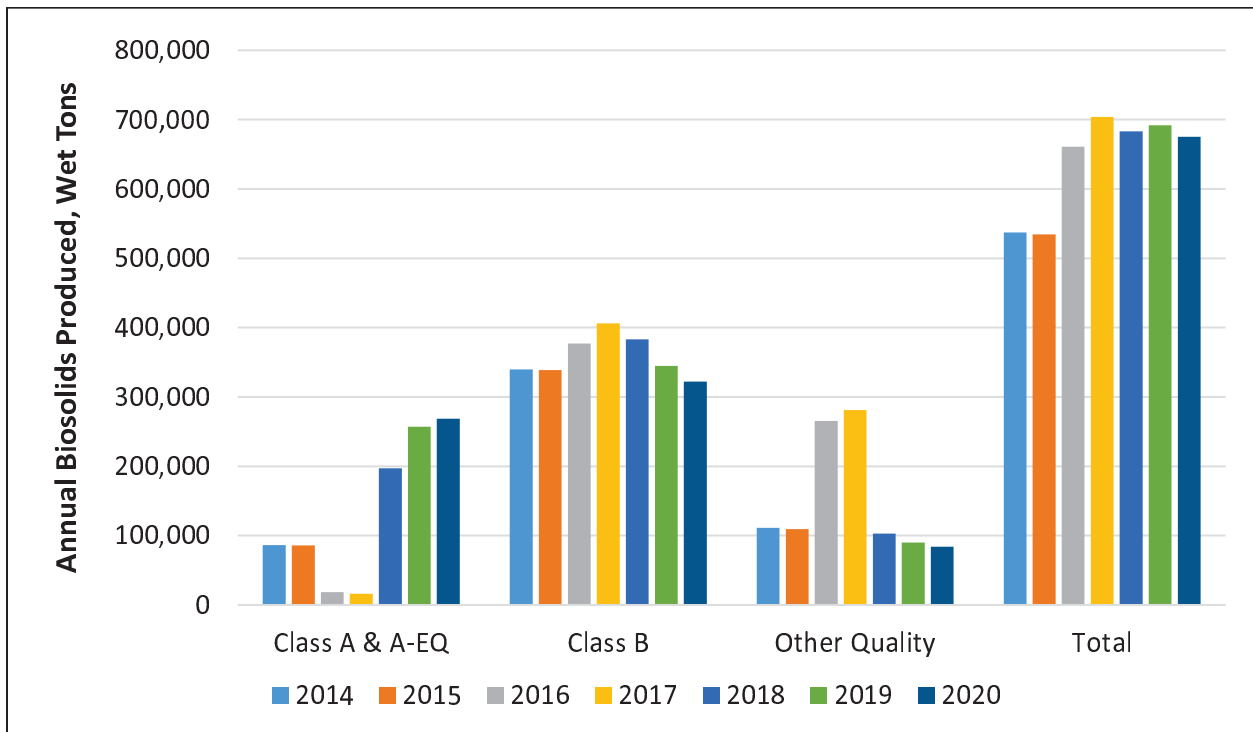


Figure 2. Aggregate wet tons of biosolids of different classes produced by survey respondents.

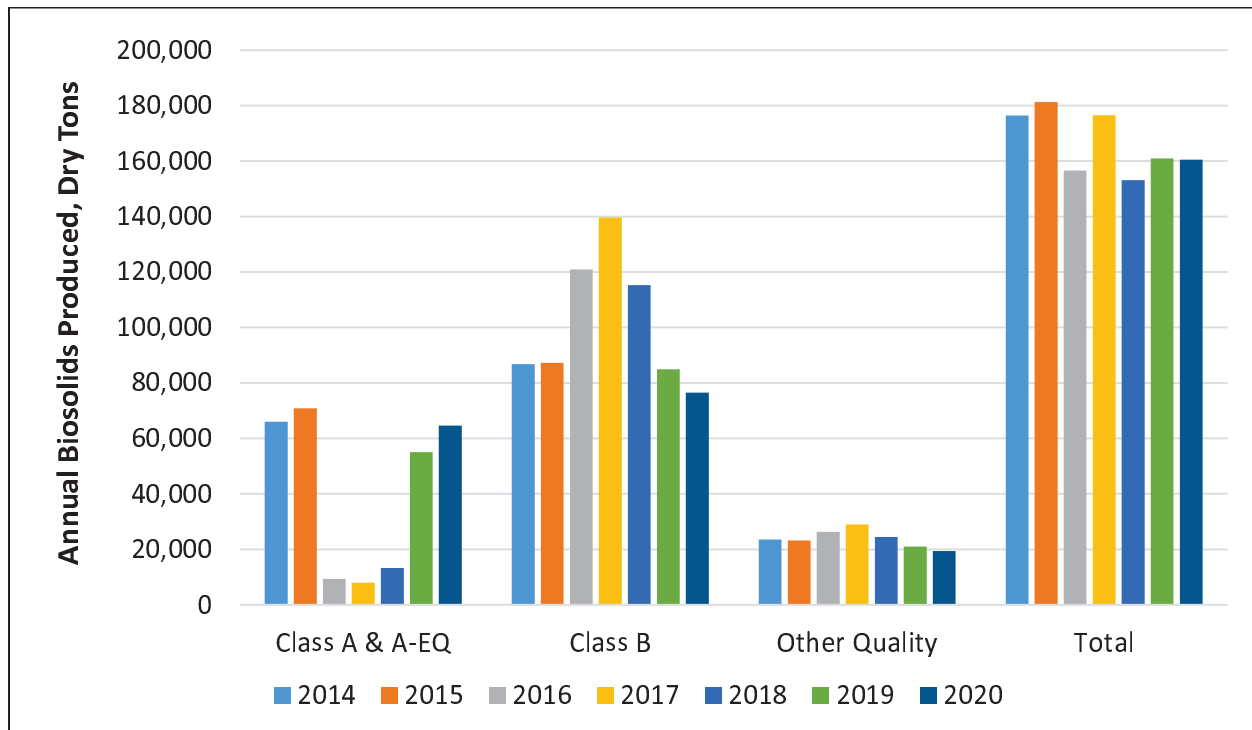


Figure 3. Aggregate dry tons of biosolids of different classes produced by survey respondents.

4. Management Options, Management Costs and Dewatering Statistics

Biosolids Reuse and Disposals Options

The amount of biosolids sent to each type of reuse and disposal destination by each responding agency is reported in **Table 2**. The accompanying **Figure 4** and **Figure 5** illustrate the relative importance of each reuse and disposal method for wet and dry tons, respectively. Reuse via landfill ADC receives the largest amount of dry tonnage of biosolids in the region, followed by land application. Onsite disposal accounts for a large amount of wet tonnage, but a small amount of dry tonnage because of the low solids content.

The change in reuse and disposal methods over time is illustrated in **Figure 6** (wet tons) and **Figure 7** (dry tons) (see page 11). From 2017 to 2020, there was a significant drop in the wet and dry tonnage of biosolids sent to landfill ADC. By tonnage, the largest reductions were due to changes in biosolids management practices at San Francisco Public Utilities Commission, East Bay Municipal Utility District, and the City of Petaluma. In addition, four agencies (Benicia, Delta Diablo, Livermore, and Union Sanitary District) sent biosolids to landfill disposal or ADC in 2017, but not in 2020.

Table 2. Wet tons of biosolids delivered by usage, 2020.

Agency	ADC	Landfill Disposal	Land Application	Compost	Lystek	Biochar	Incineration	Onsite Disposal	Storage	Sum
American Canyon, City of	0	131	0	0	0	0	0	0	0	131
Benicia, City of	0	0	0	0	2,488	0	0	0	0	2,488
Central Contra Costa Sanitary District	0	0	0	0	206	0	66,310 ^a	0	0	66,516
Central Marin Sanitation Agency	2,415	0	1,540	0	1,775	0	0	0	0	5,730
Delta Diablo	0	0	13,615	23	0	0	0	0	0	13,638
Dublin San Ramon Services District	0	0	0	0	0	0	0	174,329	0	174,329
East Bay Municipal Utility District	19,463	0	44,411	5,738	0	0	0	0	0	69,612
Fairfield-Suisun Sewer District	0	0	0	0	22,668	0	0	0	0	22,668
Hayward, City of	4,222	0	0	0	0	0	0	0	0	4,222
Las Gallinas Valley Sanitary District	0	0	0	0	0	0	0	6,255	0	6,255
Livermore, City of	0	0	9,164	0	0	0	0	0	0	9,164
Millbrae, City of	0	0	1,464	0	0	0	0	0	0	1,464
Mt. View Sanitary District	937	0	0	0	0	0	0	0	0	937
Napa Sanitation District	0	0	19,721	0	0	0	0	0	0	19,721
Novato Sanitary District	0	0	0	0	0	0	0	12,865	0	12,865
Oro Loma Sanitary District	0	0	5,229	0	0	0	0	0	0	5,229
Palo Alto, City of	0	0	0	11,321	6,218	0	0	0	0	17,539
Petaluma, City of	2,935 ^b	0	3,072 ^b	0	1,286 ^b	0	0	0	0	7,293
San Francisco Public Utilities Commission	7,259	0	21,722	0	11,458	0	0	0	11,168	51,607
San Jose, City of	59,972	0	0	0	0	0	0	0	0	59,972
San Leandro, City of	0	0	3,167	0	0	0	0	0	0	3,167
San Mateo, City of	3,814	0	3,907	0	0	0	0	0	0	7,721
Santa Rosa, City of	1,255	1,255	21,235	2,297	5,214	0	0	0	1,418	32,673
Sewer Authority Mid-Coastside	2,171	0	0	0	0	0	0	0	0	2,171

BACWA 2021 Biosolids Trends Survey

Agency	ADC	Landfill Disposal	Land Application	Compost	Lystek	Biochar	Incineration	Onsite Disposal	Storage	Sum
Sewerage Agency of Southern Marin	1,479	0	0	0	0	0	0	0	0	1,479
Silicon Valley Clean Water	63	0	12,259	66	0	260	0	0	0	12,648
South San Francisco - San Bruno WQCP, City of	9,730	0	0	0	0	0	0	0	0	9,730
Sunnyvale, City of	207	0	5,574	0	0	0	0	0	0	5,781
Union Sanitary District	0	0	14,452	6,342	0	0	0	0	0	20,793
Vallejo Flood & Wastewater District	0	0	10,910	0	1,099	0	0	0	0	12,009
West County Wastewater District	0	22,000	0	0	0	0	0	0	0	22,000
Total	115,921	23,386	191,441	25,786	52,412	260	66,310	193,449	12,586	681,551

^a Calculated based on survey response for total biosolids generated minus the amount sent to Lystek.

^b Calculated based on survey response for deliveries of dry biosolids and percent solids.

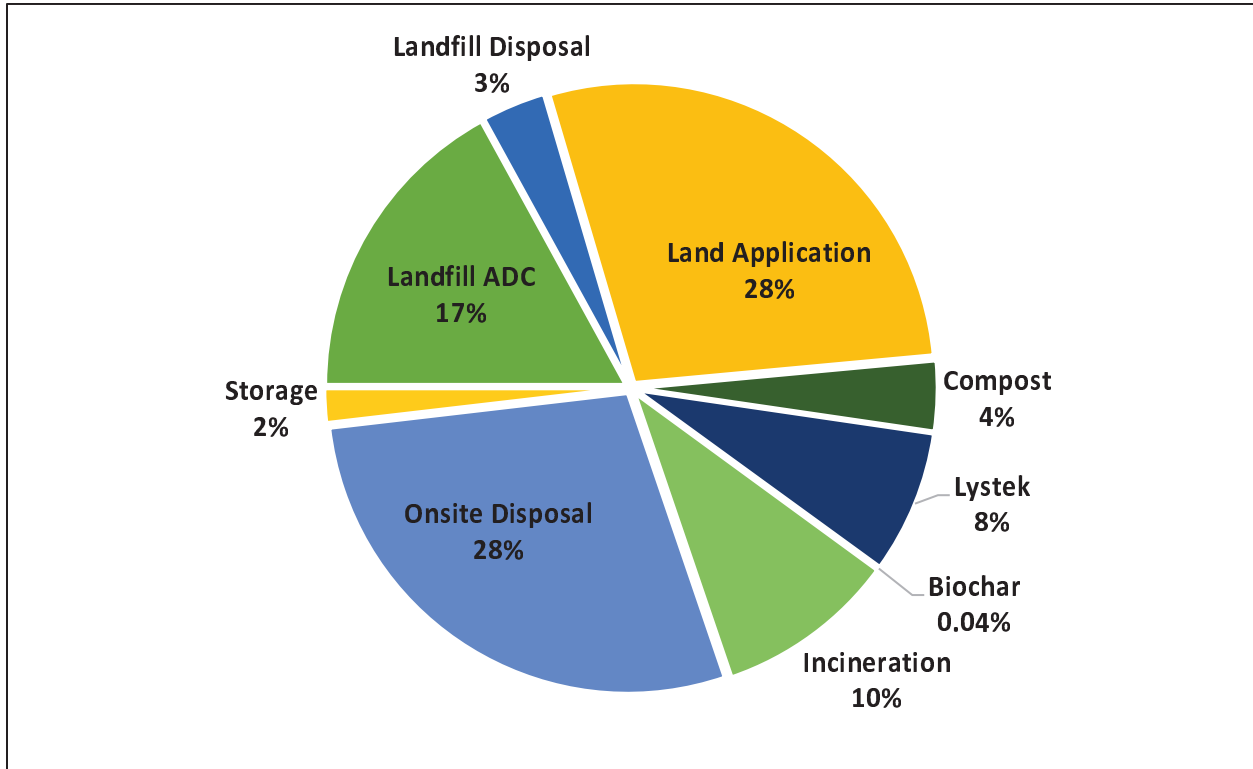


Figure 4. Relative wet tonnage of biosolids per reuse and disposal method in 2020.

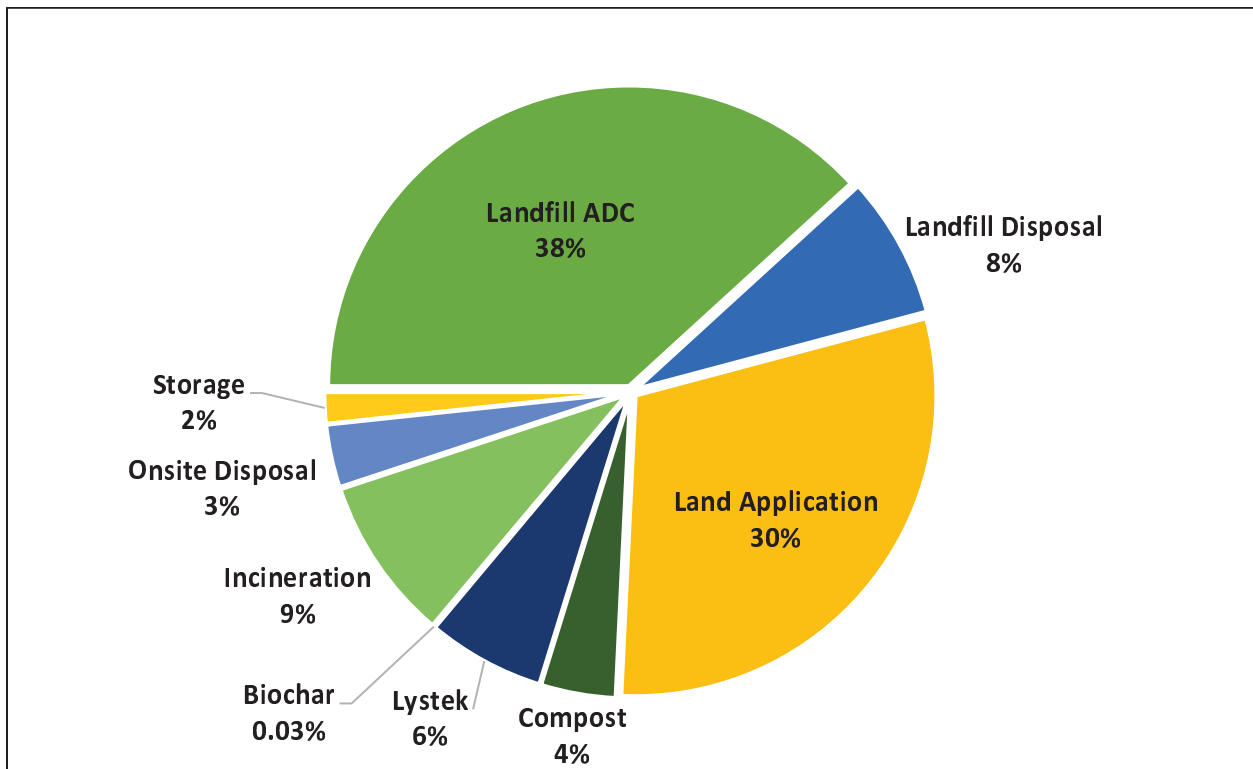


Figure 5. Relative dry tonnage of biosolids per reuse and disposal method in 2020.

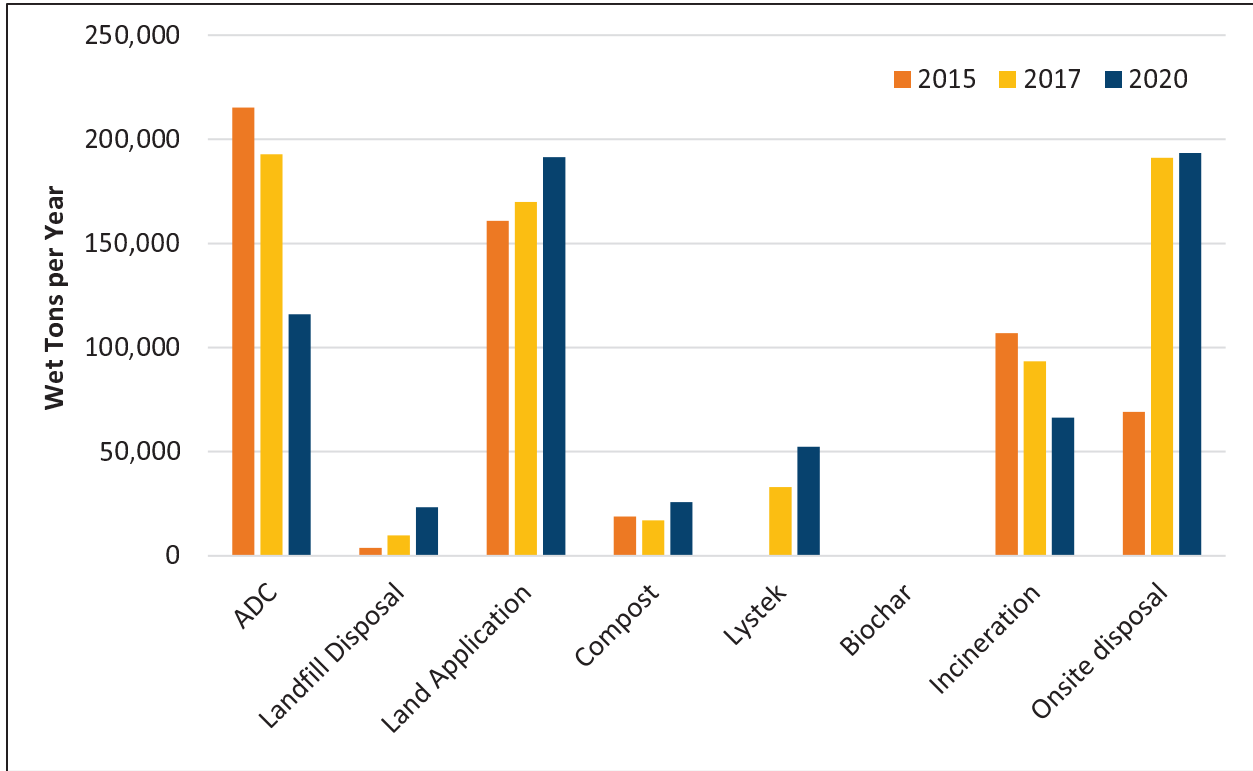


Figure 6. Wet tonnage of biosolids per reuse and disposal method, 2015 to 2020.

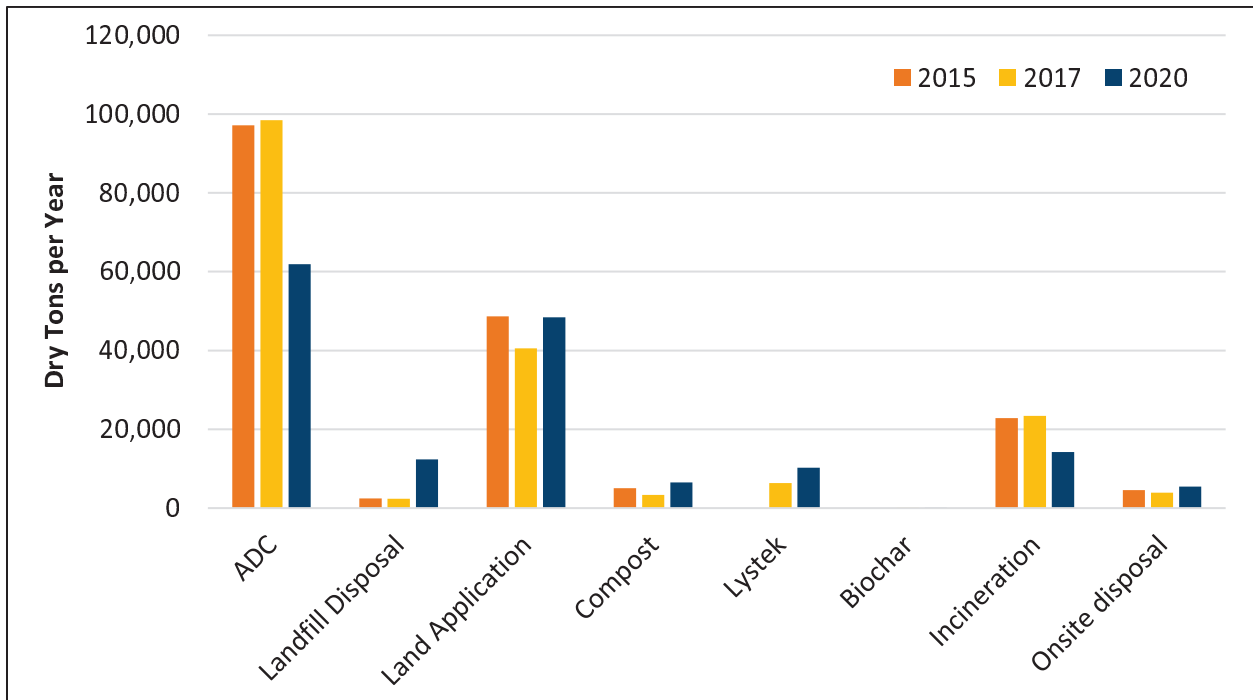


Figure 7. Dry tonnage of biosolids per reuse and disposal method, 2015 to 2020.

Another way to measure the relative importance of reuse and disposal methods is by counting the number of agencies that employ each, as illustrated in **Figure 8**. As can be seen in **Table 2**, many agencies use more than one reuse or disposal management strategies. Out of the thirty-one responding agencies, sixteen used land application, making it the most popular management strategy. Landfill ADC was the most popular management strategy in both previous surveys, but it was the second-most popular in the 2020 survey. Treatment at Lystek was the next most popular, followed by composting. Landfill disposal and onsite disposal were by three agencies each. Incineration and biochar production were used by one agency each.

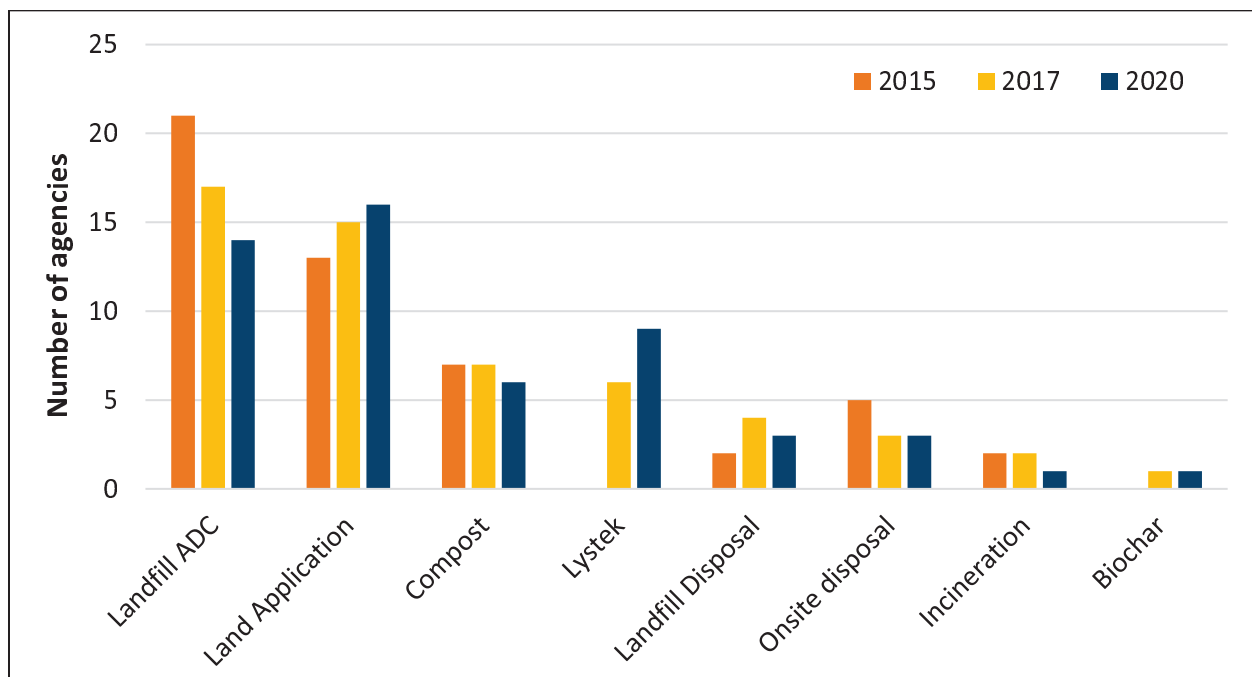


Figure 8. Changes in biosolids management practices for 31 survey respondents, 2015 to 2020.

As of 2020, nine agencies were sending biosolids to the Lystek Organic Materials Recovery Center (OMRC) located in Fairfield. The OMRC began processing biosolids to produce Class A-EQ liquid fertilizer in 2016, and in 2020 it accounted for 8% of total wet tonnage produced by survey respondents (6% of total dry tonnage).

While Lystek grew in popularity as a biosolids reuse option, landfill ADC continued to become less popular: In 2015, 21 agencies sent biosolids to landfill ADC, while in 2020, just 14 agencies sent biosolids to landfill ADC. Benicia, Delta Diablo, Livermore, and Union Sanitary District sent biosolids to landfill disposal or ADC in 2017, but not in 2020. More agencies (most notably San Jose) are expected to move away from landfill ADC and disposal in the future due to SB 1383 (see **Table 6**).

Management Costs

Agencies that send biosolids to multiple destinations report a range of costs per ton. Minimum and maximum reported hauling and tipping costs for each agency are reported in **Table 3**. Where costs were provided by the respondent as a range, the mean of the range was used for that destination. Total costs per agency are calculated by multiplying tons of solids by cost per ton for each destination and summing the destinations. Average costs for each agency are calculated by dividing total cost by tons of biosolids.

Table 3. Hauling and tipping costs for agencies

Agency Name	Minimum Cost (\$/Ton)	Maximum Cost (\$/Ton)	Average Cost (\$/Ton)	Approx. Total Cost (\$/Yr)
American Canyon, City of	Not provided. Hauling included in City's waste disposal contract.			
Benicia, City of	\$139	\$139	\$139	\$346,000
Central Contra Costa Sanitary District	Not Avail.	\$93 (Lystek)	Onsite incineration. Cost information not provided.	
Central Marin Sanitation Agency	\$50	\$99	\$66	\$381,000
Delta Diablo	\$50	\$80	\$50	\$683,000
Dublin San Ramon Services District	Onsite disposal. Cost information not provided.			
East Bay Municipal Utility District	\$35	\$68	\$54	\$3,744,000
Fairfield-Suisun Sewer District	Not provided. Lystek facility is located onsite.			
Hayward, City of	Not provided. Hauling included in City's waste disposal contract.			
Las Gallinas Valley Sanitary District	\$14	\$14	\$14	\$88,000
Livermore, City of	\$41	\$41	\$41	\$376,000
Millbrae, City of	\$76	\$76	\$76	\$111,000
Mt. View Sanitary District	\$54	\$54	\$54	\$51,000
Napa Sanitation District	Onsite disposal. Cost information not provided.			
Novato Sanitary District	\$17	\$17	\$17	\$220,000
Oro Loma Sanitary District	\$40	\$40	\$40	\$209,000
Palo Alto, City of	\$67	\$98	\$78	\$1,364,000
Petaluma, City of	\$61	\$117	\$75	\$546,000
San Francisco Public Utilities Commission	\$65	\$101	\$84	\$4,356,000
San Jose, City of	\$26	\$26	\$26	\$1,535,000
San Leandro, City of	\$53	\$53	\$52	\$166,000
San Mateo, City of	\$30	\$47	\$39	\$64,000
Santa Rosa, City of	\$4	\$115	\$31	\$1,007,000
Sewer Authority Mid-Coastside	\$68	\$68	\$68	\$147,000
Sewerage Agency of Southern Marin	\$324	\$324	\$323	\$478,000
Silicon Valley Clean Water	\$49	\$80	\$54	\$685,000

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Agency Name	Minimum Cost (\$/Ton)	Maximum Cost (\$/Ton)	Average Cost (\$/Ton)	Approx. Total Cost (\$/Yr)
South San Francisco - San Bruno WQCP, City of	\$62	\$62	\$62	\$607,000
Sunnyvale, City of	\$161 ^a	\$212 ^a	\$163 ^a	\$940,000 ^a
Union Sanitary District	\$35	\$61	\$43	\$895,000
Vallejo Flood & Wastewater District	\$25	\$75	\$30	\$356,000
West County Wastewater District ^b	Not provided	\$162 ^b	Not provided	Not provided
Subtotal (25 of 31 agencies reporting)				\$20,655,000

^a Cost has been converted to equivalent for wet biosolids, although City pays based on dry weight basis. Dewatering is included in cost.

^b West County Wastewater District reported costs for biosolids dewatered and hauled by a contractor. Additional biosolids disposal services for most of the District's biosolids are covered under a separate franchise agreement.

For the 23 agencies that reported costs in both 2017 and 2020, total costs rose about 12%, from about \$17M in 2017 to \$19M in 2020. This represents a 12% increase in costs over three years; by comparison, the U.S. inflation rate was about 6% over the 3-year period from 2017 to 2020. Cost increases significantly higher than the rate of inflation were also reported in the 2017 biosolids survey report (12% increase in cost, vs. 3% inflation over 2 years).

The range of hauling and tipping costs associated with each reuse and disposal alternative are plotted in **Figure 9**. For agencies with available land, onsite disposal is by far the lowest-cost option. As in the previous survey, unit costs for landfill ADC and land application showed a very large range, with landfill ADC (median cost: \$65/ton) proving to be more expensive than land application (median cost: \$54/ton). Costs increased dramatically for both landfill ADC (increase from \$48 to \$65/ton, or a 36% increase in 3 years) and for land application (increase from \$33 to \$54/ton, or a 64% increase over 3 years).

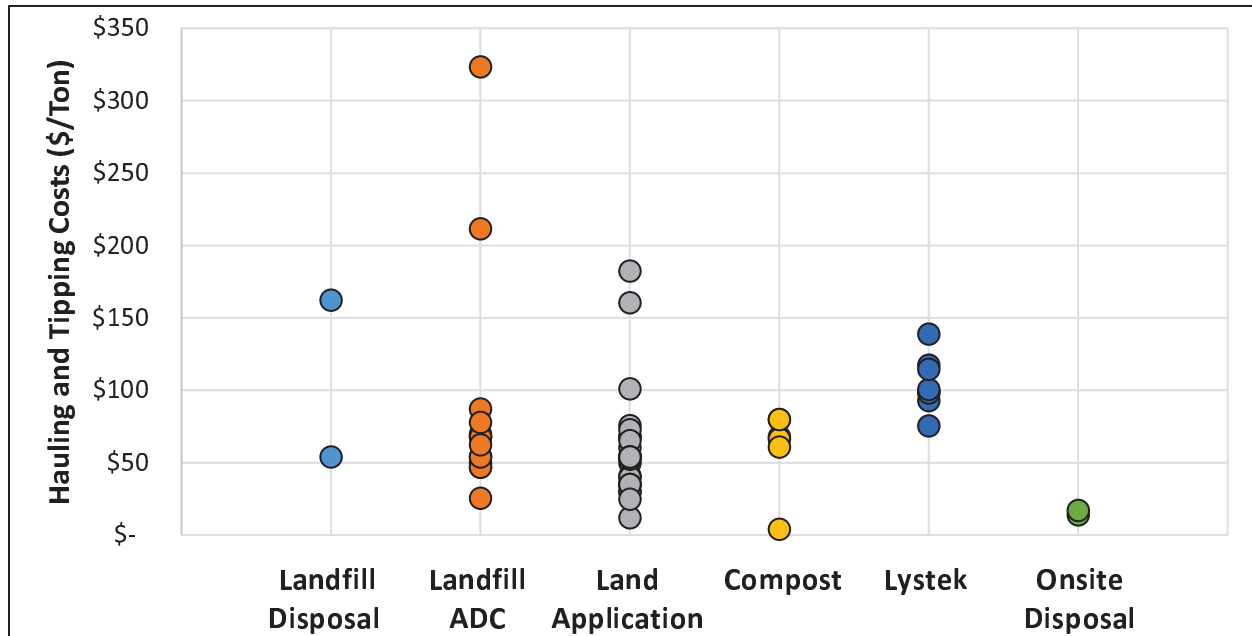


Figure 9. Tipping and Hauling Costs for each reuse/disposal alternative.

Hauling Distance

The range of round-trip hauling distances for each agency, as well as total ton-miles, are listed in **Table 4**. The ton-miles provides a metric for the total hauling burden for each agency. The combined hauling burden for all survey respondents (45.2 million ton-miles) is within 1% of the total 2017 value of 45.0 million ton-miles.

Table 4. Round-trip Distance Hauled

Agency	Minimum Distance Hauled (Round Trip, miles)	Maximum Distance Hauled (Round Trip, miles)	Total Ton-Miles
American Canyon, City of	63	63	8,400
Benicia, City of	40	40	99,600
Central Contra Costa Sanitary District	0 (On-site incineration)	46 (Lystek)	9,400
Central Marin Sanitation Agency	36	110	405,400
Delta Diablo	300	480	4,095,400
Dublin San Ramon Services District	0	0	0
East Bay Municipal Utility District	80	270	13,915,000
Fairfield-Suisun Sewer District	0	0	0
Hayward, City of	64	64	270,200
Las Gallinas Valley Sanitary District	0	0	1,800
Livermore, City of	150	150	1,374,600
Millbrae, City of	240	240	351,400
Mt. View Sanitary District	58	58	54,400

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Agency	Minimum Distance Hauled (Round Trip, miles)	Maximum Distance Hauled (Round Trip, miles)	Total Ton-Miles
Napa Sanitation District	0	6	49,200
Novato Sanitary District	0	0	0
Oro Loma Sanitary District	120	120	627,400
Palo Alto, City of	148	228	3,501,400
Petaluma, City of	76	218	701,000
San Francisco Public Utilities Commission	52	242	5,671,200
San Jose, City of	4	4	239,800
San Leandro, City of	170	170	538,400
San Mateo, City of	140	252	1,672,600
Santa Rosa, City of	1	96	1,631,000
Sewer Authority Mid-Coastside	10	10	21,800
Sewerage Agency of Southern Marin	45	45	66,800
Silicon Valley Clean Water	0	282	2,841,200
South San Francisco - San Bruno WQCP	106	106	1,035,400
Sunnyvale, City of	176	240	1,263,200
Union Sanitary District	158	242	4,479,000
Vallejo Flood & Wastewater District	26	34	321,000
West County Wastewater District	Not Avail.	Not Avail.	Not Avail.
Total (30 of 31 agencies reporting)			45,246,000

Dewatering Statistics

The on-site methods employed by agencies to dewater biosolids prior to final use included drying beds, centrifuges, presses, and dryers. Dewatering equipment employed by each agency, as well as the resulting percentage of solids, is listed in **Table 5**.

Table 5. Percentage Solids, Dewatering technology type and manufacturer for each agency

Agency	Percent Solids	Dewatering Technology	Equipment Manufacturer
American Canyon, City of	25%	Screw Press	-
Benicia, City of	14-16%	Belt Filter Press	Ashbrook press
Central Contra Costa Sanitary District	22%	Centrifuge	Sharples, being replaced with Andritz within next 5 years
Central Marin Sanitation Agency	27%	Centrifuge	Centrisys CS18-4
Delta Diablo	25%	Centrifuge	Flottweg centrifuges
Dublin San Ramon Services District	2.6%	No dewatering	N/A
East Bay Municipal Utility District	24%	Centrifuge	Humbolt and Flottweg
Fairfield-Suisun Sewer District	16%	Drying Bed, Screw Press	FKC Screw Press
Hayward, City of	>80%	Drying Bed	N/A

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Agency	Percent Solids	Dewatering Technology	Equipment Manufacturer
Las Gallinas Valley Sanitary District	3.3%	Thickening in Storage Lagoon	N/A
Livermore, City of	16.2%	Belt Filter Press	Simon Ashbrook
Millbrae, City of	19%	Belt Filter Press	Andritz
Mt. View Sanitary District	25-49%	Centrifuge, Drying Bed	Centritech centrifuge
Napa Sanitation District	17-30%	Belt Filter Press. Contractor used centrifuges to dewater pond solids.	Ashcroft
Novato Sanitary District	5.5%	Sludge Lagoons	N/A
Oro Loma Sanitary District	80%	Belt Filter Press, Drying Bed, Belt Press to approx 13%, air drying to 80%	BDP Belt press
Palo Alto, City of	29%	Belt Filter Press	4 belt filter presses manufactured by Andritz
Petaluma, City of	18-19%	Screw Press	FKC Screw Press and USGI Polyblend liquid polymer feed system
San Francisco Public Utilities Commission	23%	Centrifuge, Screw Press	FKC - Screw Press, Humboldt and Sharpels - Centrifuges
San Jose, City of	79%	Drying Bed	A capital project (Digested Sludge Dewatering Facility) is currently underway to install centrifuges that will replace the current lagoon and drying bed process. Future centrifuges have not yet been purchased.
San Leandro, City of	50-80%	Belt Filter Press	BDP
San Mateo, City of	22%	Centrifuge	GEA Westfalia Centrifuge model CC 458-00-32
Santa Rosa, City of	15-16%	Belt Filter Press	Ashbrook
Sewer Authority Mid-Coastside	17%	Belt Filter Press	Ashbrook
Sewerage Agency of Southern Marin	20%	Belt Filter Press	BDP
Silicon Valley Clean Water	19-44%	Fournier Rotary Fan Press	Fournier Rotary Fan Press, Bioforce Tech Bio-dryers & Pyrolysis
South San Francisco - San Bruno WQCP, City of	14-18%	Belt Filter Press	Komoline-Sanderson
Sunnyvale, City of	22-29%	Centrifuge, Belt Filter Press	Dewatering equipment is owned and operated by the contractor, Synagro

Agency	Percent Solids	Dewatering Technology	Equipment Manufacturer
Union Sanitary District	24%	Centrifuge	Andritz D5LL Decanter Centrifuges
Vallejo Flood & Wastewater District	30%	Belt Filter Press	Ashbrook
West County Wastewater District	17-77%	Belt Filter Press, Drying Bed	Not Avail.

5. Challenges and Future Planning

Challenges

Agencies were asked to rank the challenges facing their biosolids program. The following challenges are ranked from the aggregate responses from most to least important:

1. Securing sustainable use and disposal options
2. Rising costs
3. Hauling distance
4. Public health concerns regarding land application (PFAS, microplastics, pathogens, etc.)
5. Regulatory Restrictions on using Biosolids for Alternative Daily Cover (SB 1383)
6. Local restrictions on land application
7. Public perception/relations
8. Space for drying operations
9. Wet weather impeding drying operations

Reasons listed as “other” included:

- Accommodating local trash haulers that need to divert organic waste from landfills
- Limitations on future land application
- Odor concerns from the public
- Concern that PFAS and microplastics could be challenges in the future
- Air regulations associated with incineration
- The lack of local disposal options, which drives up costs

Overall, securing sustainable use and disposal options was the top concern. This differs from the 2016 and 2018 surveys, when rising costs were cited as the top concern overall. 11 of 31 agencies listed “securing sustainable use and disposal options” as the #1 concern, while 10 of 31 agencies listed “rising costs” as the top concern.

Future Biosolids Management Plans

The survey asked respondents about their plans for biosolids management in 2021. 28 of 31 respondents selected the response “Same plan/strategy as 2020.” The remaining 3 agencies had the following responses:

- Delta Diablo: *“We will start sending a portion of our biosolids to Lystek.”* Starting July 1, 2021, Delta Diablo began sending two truckloads per month to the Lystek facility at Fairfield Suisun Sewer District for further processing to Class A standards.
- Mt. View Sanitary District: *“All biosolids will continue to go to the landfill in 2021. It is anticipated that biosolids will begin going to Lystek in 2022.”*
- San Francisco Public Utilities Commission: *“We have phased out the use of landfill ADC entirely as of fall 2020.”*

Additionally, the Silicon Valley Clean Water response noted that the agenda hopes to divert more biosolids to Bioforce Tech in late 2021.

The survey also specifically asked about agency’s responses to SB 1383, which mandates diversion of organics from landfills in order to reduce short-lived climate pollutants (i.e., methane). SB 1383 will require a 75% reduction in organics from landfills compared to 2014 levels. This new legislation is expected to have two main impacts on biosolids disposal:

- Biosolids used as landfill ADC will be considered disposal instead of beneficial reuse, which will sharply limit ADC use of biosolids;
- Municipalities will need to divert organic materials (green waste, food waste, etc.) from landfills. If wastewater agencies provide opportunities for co-digestion of these diverted materials, there will be an increase in the production of digested biosolids and of biogas at POTWs.

Responses to the survey question about the status of implementation readiness for SB 1383 are summarized below in **Figure 10**, with additional details reported in **Table 6**. As summarized in **Figure 9**, agencies reported the following strategies for responding to the mandates in SB 1383.

- 11 agencies (Central Marin Sanitation Agency, East Bay Municipal Utility District, Millbrae, Oro Loma Sanitary District, Petaluma, San Francisco Public Utilities Commission, San Jose, Santa Rosa, Sewerage Agency of Southern Marin, Sunnyvale, and Union Sanitary District) plan an increased reliance on **land application**.
- 9 agencies (Delta Diablo, East Bay Municipal Utility District, Fairfield-Suisun Sewer District, Mt. View Sanitary District, Petaluma, San Francisco Public Utilities Commission, San Jose, Santa Rosa, and Union Sanitary District) will **increase the volume of biosolids sent to another facility or third party for additional treatment** (i.e., Lystek or composting).
- 4 agencies (Hayward, Silicon Valley Clean Water, South San Francisco - San Bruno, and West County Wastewater District) will **improve treatment technology at the plant** to expand use and disposal options.

- 4 agencies (Petaluma, South San Francisco - San Bruno, Union Sanitary District, and West County Wastewater District) will **add digester capacity for organics co-digestion** at the plant.

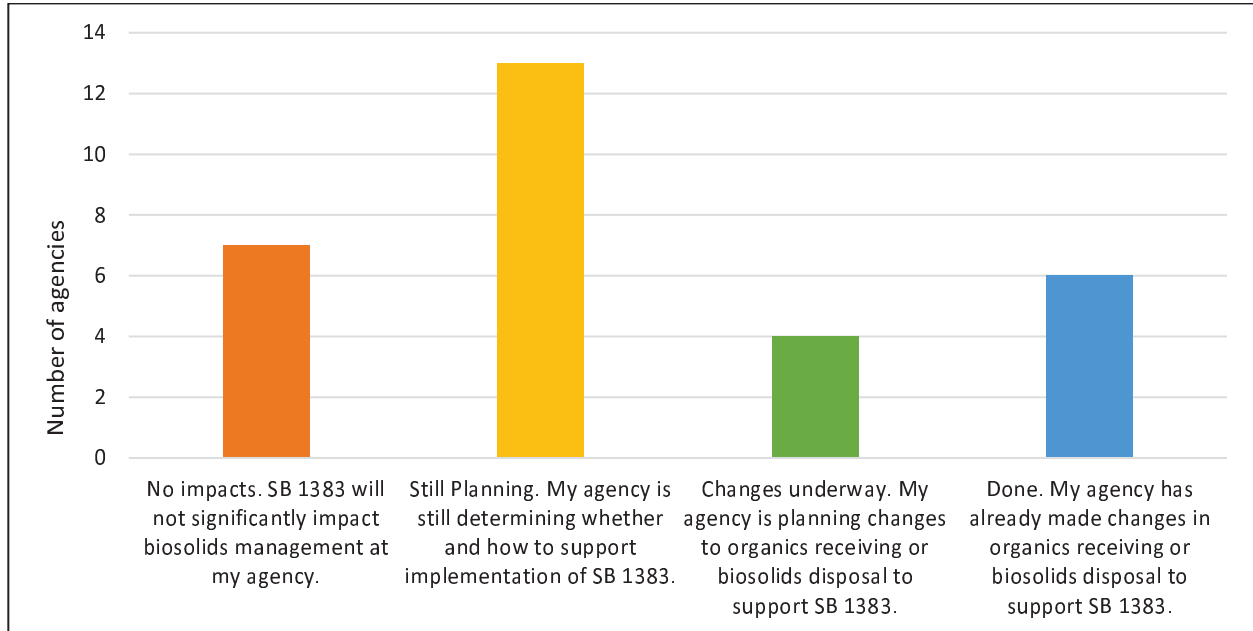


Figure 10. Survey Responses regarding Status of Implementation Readiness for SB1383.

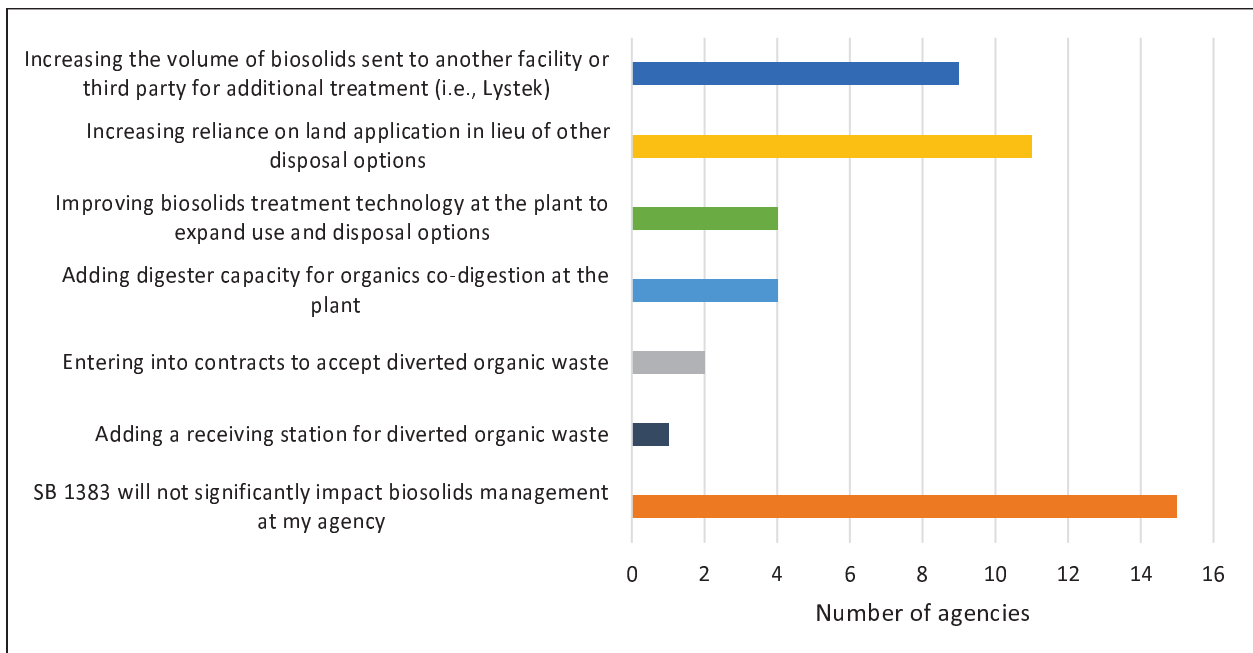


Figure 11. Agency Plans for Responding to SB 1383's Limits on Landfill Use and Disposal

Table 6. Agency Plans to Respond to SB 1383 as of 2018

Agency	Status of Implementation Readiness for SB1383				Details
	No SB1383 Impacts	Still Planning	Changes Underway	Complete	
American Canyon, City of		x			
Benicia, City of			x		Present hauler (Republic Services) to compost at their facility.
Central Contra Costa Sanitary District	x				Evaluating how classification of sewage sludge incineration as "landfilling" will affect our site
Central Marin Sanitation Agency		x			
Delta Diablo		x			
Dublin San Ramon Services District		x			SB1383 does not immediately impact our agency since we dispose of biosolids at our own Dedicated Land Disposal facility.
East Bay Municipal Utility District			x		
Fairfield-Suisun Sewer District				x	
Hayward, City of		x			
Las Gallinas Valley Sanitary District	x				
Livermore, City of	x				
Millbrae, City of	x				
Mt. View Sanitary District					
Napa Sanitation District	x				
Novato Sanitary District		x			
Oro Loma Sanitary District				x	
Palo Alto, City of		x			
Petaluma, City of				x	
San Francisco Public Utilities Comm.				x	

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Agency	Status of Implementation Readiness for SB1383				Details
	No SB1383 Impacts	Still Planning	Changes Underway	Complete	
San Jose, City of			x		Dewatered biosolids will be directly land applied, composted, and/or further treated before being beneficially used.
San Leandro, City of	x				
San Mateo, City of		x			
Santa Rosa, City of				x	
Sewer Authority Mid-Coastside		x			
Sewerage Agency of Southern Marin		x			
Silicon Valley Clean Water				x	Divert 50% of biosolids to Bioforce Tech for biochar production. Currently receiving diverted organic waste
South San Francisco - San Bruno WQCP, City of		x			We are in the planning stages of trying to set up agreements with local trash company to receive organic waste to produce more methane onsite. We would add a receiving station and larger cogen to harvest the increase methane gas and go PG&E neutral. Would rehab our dewatering facility.
Sunnyvale, City of		x			The City is still evaluating a response and timeline to implement strategies in response to SB1383. In the near term, the City will be prioritizing an increased reliance on land application. Future considerations include a 5th digester (for thickened WAZ, anticipated increases in solids, and co-digestion), pursuing contracts with a third party for additional treatment (i.e., Lystek), and potentially adding a receiving station for the diversion of organic wastes.
Union Sanitary District		x			
Vallejo Flood & Wastewater District	x				
West County Wastewater District			x		

6. Public Outreach

Marketing

The survey asked whether agencies directly market their biosolids products, or whether another entity markets biosolids products on their behalf.

- No agencies reported directly marketing or branding their own biosolids products.
- 11 agencies (Benicia, Central Marin Sanitation Agency, Delta Diablo, Fairfield-Suisun Sewer District, Palo Alto, San Francisco Public Utilities Commission, Santa Rosa, Silicon Valley Clean Water, Sunnyvale, Union Sanitary District, and West County Wastewater District) report that a third party such as Lystek or Synagro markets biosolids products on their behalf.

Outreach and Education

Agencies were asked whether they conduct any outreach or publicity pertaining to their biosolids programs, and via what venue. Six agencies replied that they conduct outreach pertaining to biosolids, mainly through agency websites and/or bill inserts, as illustrated in **Figure 12**. 14 agencies in this survey replied that they conduct outreach, but not for biosolids in particular. Seven agencies replied that they do not conduct outreach at all. Overall, the responses were similar to the 2016 and 2018 responses, except that in 2018 survey agency (Napa Sanitation District) reported using print media. Napa Sanitation District continues an active outreach program through educational programs, tours, and open house events. Silicon Valley Clean Water noted that biosolids are included in the 1-week Sewer Science program at high schools in their service area.

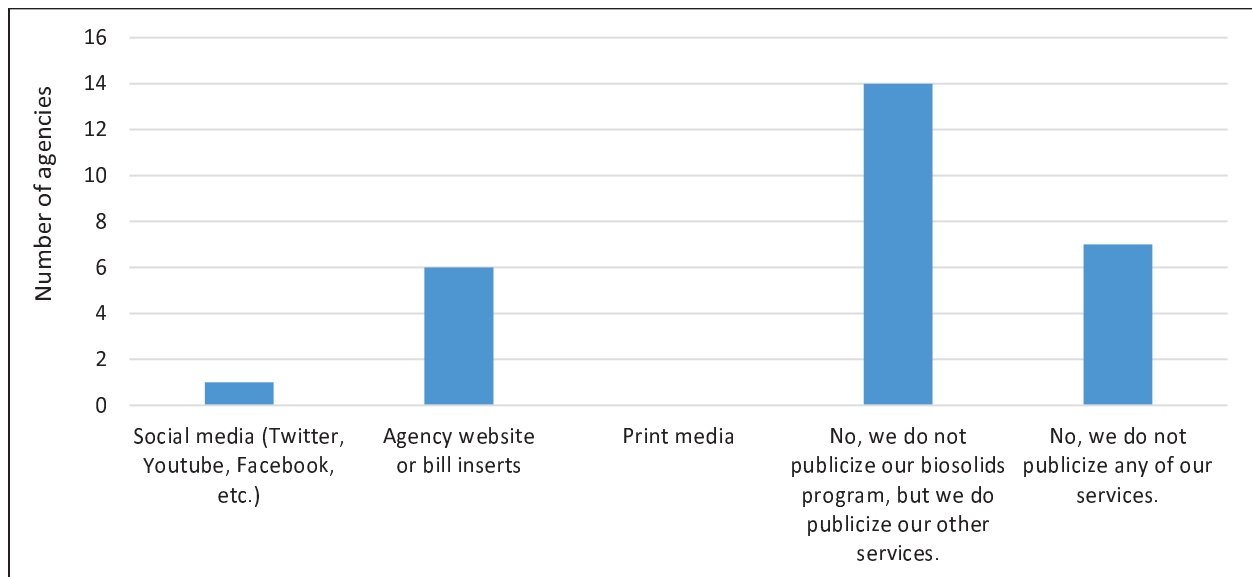


Figure 12. Number of agencies doing biosolids outreach via traditional and social media.

7. Biosolids Staffing

The survey asked respondents to describe how their agency manages biosolids staffing, including the number of Full Time Equivalent (FTE) positions. Two out of 31 agencies (Sunnyvale and West County Wastewater District) noted use of contractors to manage biosolids-related operations. Complete responses are shown below in **Table 7**. The two agencies reporting the largest dedicated staff are the City of San Jose (12 FTEs) and Central Contra Costa Sanitation District (3.5 FTEs). Adding up the 25 agencies that provided estimated staffing levels, the total is more than 50 Full Time Equivalent positions.

Table 7. Agency Staffing for Biosolids

Agency	How many Full Time Equivalent (FTE) staff are required for biosolids management?	Please describe the roles of staff assisting with biosolids management.
American Canyon, City of	0.33	Turning on the press, checking the press, sampling and reporting
Benicia, City of	0.2	Operator to dewatering solids. Hauling is performed by contract operator.
Central Contra Costa Sanitary District	3.5	operating incinerator and solids handling equipment, hauling coordination, regulatory reporting
Central Marin Sanitation Agency	2	1 FTE operation staff would set up, operate the centrifuge, which runs approximately 10hrs/day, and unload biosolids to a truck daily; 0.5 FTE engineering staff would manage the chemical procurement, biosolids hauling, and disposal contracts; 0.5 FTE maintenance staff would provide services to all the dewatering equipment.
Delta Diablo	2.5	Operators - produce and process the biosolids; Ops Supervisor - tracks digester data (temp, VSR, detention; Ops Manager - Oversees Syangro and Lystek contracts, performs reporting; Lab staff - samples, analyzes biosolids; Engineering - assists w/RFPs, contracts, regulatory issues
Dublin San Ramon Services District	1	6 seasonal staff (during harvesting season) operating dredge, tractor, injector, and soil preparation. 1 FTE oversees biosolids harvesting.
East Bay Municipal Utility District	-	No one FTE is allocated for biosolids, but at least 5 people have biosolids responsibilities: Contract and program management, quality control and reporting, invoicing, day-to-day operations.

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Agency	How many Full Time Equivalent (FTE) staff are required for biosolids management?	Please describe the roles of staff assisting with biosolids management.
Fairfield-Suisun Sewer District	1	We do not have dedicated biosolids staff. Roles shared between engineering, operations, and regulatory
Hayward, City of	2	Operations manages polymer dosing and Maintenance manages the sludge drying bed process
Las Gallinas Valley Sanitary District	-	Contracted to a third party
Livermore, City of	2	They are Belt Press Operators - Contractor hauls Biosolids to land apply or ADC
Millbrae, City of	-	4 Operators. Operator is assigned to dewatering daily or as needed
Mt. View Sanitary District	1	1 Lab Analyst performs weekly process control monitoring. 5 Operators and 1 Supervisor maintain and operate sludge pumps, grit removal, sludge thickening, sludge digestion, scum handling, sludge dewatering and disposal.
Napa Sanitation District	3	(1) Manager - oversees the biosolids program, coordinates with growers, procure agronomists, record keeping, reporting (2) Reclamation Workers - prepare fields, apply solids, incorporate solids, irrigate if needed.
Novato Sanitary District	2.5	Sludge transfer and return, lab analysis of solids and health of digester(s), reporting (EPA 503), infrastructure (piping and pumps) repair and maintenance
Oro Loma Sanitary District	0.1	Pretreatment inspector manages annual off haul, billing, and required sampling. GM does annual EPA reporting and manages RFP prep/bidding. Our lab chemist, pretreatment inspector, plant manager, and General Manager all contribute.
Palo Alto, City of	1	Plant Manager, Senior Engineer, Associate Engineer and Admin. Assistants
Petaluma, City of	3	2 FTE Operations Staff, 0.5 FTE maintenance staff, 0.5 FTE analytical/regulatory staff
San Francisco Public Utilities Commission	1	Biosolids FTE staff oversees contracts related to biosolids use, manages biosolids reporting, special projects, and improvement of current program
San Jose, City of	12	Program Manager establishing contract to manage future dewatered biosolids; other/O&M staff manage current lagoons and drying bed process. 12 positions: 5 Heavy Equipment Operators, 2 Senior HEOs, 3 Wastewater Attendants, 1 Superintendent, & 1 Program Manager
San Leandro, City of	1	a maintenance staff tills and moves material part time. Operations staff press and place in beds, Lab staff sample and analyze material. Approx. 1 FTE equivalent

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Agency	How many Full Time Equivalent (FTE) staff are required for biosolids management?	Please describe the roles of staff assisting with biosolids management.
San Mateo, City of	-	In typical fashion we have a liquids operator and solids operator and the solids operator manages the biosolids / dewatering process every shift. We do not have any FTE staff dedicated to biosolids. Operations manages it.
Santa Rosa, City of	3	Manager, senior maintenance worker, admin support.
Sewer Authority Mid-Coastside	-	Responsibilities shared by 5 staff members in operations
Sewerage Agency of Southern Marin	1.5	1 operator and 0.5 supervisor
Silicon Valley Clean Water	3	(1) Operator operating the Fournier Rotary Fan Press units, (1) Operator to operate equipment using in the concrete drying beds, (1) Operations Supervisor
South San Francisco - San Bruno WQCP, City of	-	Responsibilities shared by 14 Wastewater Operators: Running the belt presses, scheduling truck/hauling pick ups.
Sunnyvale, City of	1.5	Biosolids dewatering and hauling operations are managed by a contractor. There are no dedicated employees for biosolids management. Operations and Laboratory staff assist part time in the collection and analysis of biosolids samples. The Regulatory Division supports regulatory oversight and reporting of biosolids related data.
Union Sanitary District	1.5	Operations, field inspections and maintenance, engineering analysis, sampling, testing, invoice tracking, reporting and regulatory oversight
Vallejo Flood & Wastewater District	2	2 truck drivers (also function as general help when not driving), 1 program management (oversee other programs in addition to biosolids)
West County Wastewater District	1	Sample collection

8. Future Surveys

BACWA intends to repeat this survey in 2023 (covering biosolids activities in 2021 and 2022), and every two years thereafter. This will give the region the ability to track changes in biosolids trends over time.

BACWA member agencies are all permitted by the San Francisco Regional Water Quality Control Board. The Regional Water Board's jurisdiction includes oversight over impacts to groundwater and surface water from biosolids land application and land disposal. In 2021, Regional Water Board staff expressed renewed interest in local review of these biosolids uses to ensure water quality protection, especially in lowland areas adjacent to San Francisco Bay. The Regional Water Board's jurisdiction also includes regulatory requirements within NPDES permits, which indirectly affect biosolids management. Within the next few years, however, new regulations from the California Air Resources Board and the Bay Area Air Quality Management District regarding air toxics (e.g., from the combustion of biogas) and climate pollutants (e.g., methane) are expected to impact biosolids management to a greater extent than water quality-related requirements.

As SB 1383 Regulations are implemented, and the next two years bring clarity to approaches for biosolids reuse and disposal in California, future survey questions may be refined to better understand how agencies are responding to this shifting landscape.

**East Bay Dischargers Authority (EBDA)
Regional Biosolids Collaboration Primer
December 2021**

EBDA sustainably and cost-effectively manages the transport and discharge of wastewater into the San Francisco Bay for public agencies representing approximately one million East Bay residents. EBDA is a joint powers public agency whose members are the City of Hayward, City of San Leandro, Oro Loma Sanitary District, Union Sanitary District and Castro Valley Sanitary District (member agencies). By contract, EBDA also discharges flows from Livermore-Amador Valley Water Management Agency (LAVWMA), made up of the Cities of Pleasanton and Livermore and Dublin San Ramon Services District. EBDA and its members operate within Alameda County, California.

The EBDA and LAVWMA member agencies have historically each managed biosolids independently. Projecting into the future, the agencies expect that management options may be more limited. Several member agencies have sent all or a portion of their biosolids for use as alternative daily cover at landfills, which is now considered disposal under SB 1383 and will likely be limited. Presence of emerging contaminants such as PFAS could further limit options and/or increase their cost. To control their own destiny and buffer against future price increases, the EBDA and LAVWMA agencies are interested in collectively developing a biosolids management strategy or facility. The agencies are most interested in low-tech, proven solutions such as land application on farmland owned by the agencies, and/or compost, though other cost-effective technologies will be considered.

To move forward with a project, it must be:

- a) Lower risk than the status quo (described below)
- b) Cost-competitive over a twenty-year study horizon (i.e., ~\$70/wet ton or less)
- c) Provide a long term (20- to 50-year) biosolids management option for the member agencies

Since limiting haul distances reduces the greenhouse gas footprint of the management strategy, it is desirable for the project to also maintain or reduce truck miles traveled.

The EBDA and LAVWMA member agencies are interested in exploring opportunities for public-private partnerships for development and/or operation of a regional biosolids management strategy or facility. EBDA brings the following that can be leveraged in project development:

- Regulator Relationships: EBDA's members have strong relationships with Alameda County Waste Management Authority (StopWaste), with Board Members of several EBDA agencies also serving on StopWaste's Board. EBDA has an opportunity and a desire to partner with StopWaste to meet the biosolids recycling needs of our joint communities. EBDA and its members also have strong relationships and experience with regulatory agencies involved in permitting biosolids facilities, including the Regional Water Quality Control Board and Bay Area Air Quality Management District, as well as the ability to serve as the lead agency for CEQA.

- Access to Capital: EBDA and its members have access to low-cost capital, including a recent strong track-record in securing State Revolving Fund (SRF) and Water Infrastructure Finance and Innovation (WIFIA) loans. EBDA and its members are willing to finance project development, including but not limited to land purchase and facility construction.
- Existing Governance: The EBDA JPA and the EBDA-LAVWMA Agreement were both recently renewed, with an expiration date of 2040. Whether or not these agreements are used directly for the biosolids management partnership, they can be used as a framework.
- Dedicated Stream of Biosolids: EBDA and LAVWMA's members have significant quantities of biosolids that they are looking to dedicate to a long-term strategy, providing certainty for both our agencies and a private industry partner.

CURRENT BIOSOLIDS MANAGEMENT

Table 1 below describes current biosolids management practices at each agency.

Table 1 – Current Biosolids Management Practices

Agency	Current Practices
City of San Leandro	Sludge is anaerobically digested, dewatered using a belt filter press, and air dried. The City hauls dried biosolids and land applies them as Class A Exceptional Quality biosolids, or Class B biosolids depending on available bed space, in Solano and Sacramento Counties.
Union Sanitary District (USD)	Sludge is thickened, anaerobically digested, and dewatered using centrifuges. Class B biosolids are transported off-site for land application in Merced and Sacramento Counties. Up to 30 percent of the biosolids are composted offsite to make Class A Exceptional Quality biosolids. USD is also currently evaluating options for further processing via thermal technology to produce Class A material onsite.
City of Hayward WPCF	Sludge is anaerobically digested, dewatered in dewatering beds, and air dried for up to two years. The City hauls dried Class A biosolids to an approved landfill disposal site for use as alternative daily cover.
Oro Loma/Castro Valley Sanitary Districts	Sludge is anaerobically digested, dewatered using a belt filter press, and air dried in a solar drying facility for 3-18 months. Class A biosolids are hauled annually to an authorized land application site.
Dublin San Ramon Services District (DSRSD)	Sludge is anaerobically digested and then further treated in six Facultative Sludge Lagoons (FSLs). The biosolids reside in the FSLs three to five years, and volatile solids content of the biosolids is further reduced by 32 to 35%. The biosolids are then harvested annually from one to two FSLs. The biosolids are pumped from the bottom of the lagoons using a dredge and injected in the soil on the District's 55-acre Dedicated Land Disposal (DLD) site during the summer and fall months.
City of Livermore	Sludge is anaerobically digested, dewatered using a belt filter press, and hauled as Class B for land application in Merced County.

San Leandro, Hayward, Oro Loma/Castro Valley, and DSRSD have drying beds or DLDs, providing them with the following advantages:

- Capability to treat all material to Class A
- Material is only harvested and hauled offsite in the dry season
- Material is a high percent solids when hauled (~80% solids)

Table 2 on the following page shows the quantities of biosolids hauled by each agency in 2018-2020, as well as their per wet ton cost for biosolids hauling and disposal/management.

Table 2 –Biosolids Quantities and Current Costs per Wet Ton

Wet Tons	2018		2019		2020		% Solids	2020 Cost of Disposal (\$/ton hauling + tipping + other fees)	Notes
	Class A or A-EQ	Class B	Class A or A-EQ	Class B	Class A or A-EQ	Class B			
EBDA Members									
City of San Leandro	737	2,772	352	1,483	2,348	819	50-80%	\$ 52.50	
Union Sanitary District		20,347		20,704		20,793	23.7%	\$ 45.92	Weighted average of Class B rate (\$35.18) and Class A/Compost rate (\$61). Note that 2021 rates increased to \$54/wet ton for Class B, making the weighted average \$59.86.
City of Hayward WPCF	6,791		5,528		4,222		>80%	\$ -	Hauling included in City waste disposal contract
Oro Loma Sanitary District		6,204		6,009	5,229		80%	\$ 40.04	New contract has a rate (with escalation) of \$44.94/ton in 2022.
EBDA Total	7,528	29,324	5,880	28,195	11,800	21,612			
LAVWMA Members									
Dublin San Ramon Services District	171,403		177,441		174,329		2.62%	\$ -	The solids currently harvested are at 1.5-3% solids, and therefore quantities should not be directly compared to other agencies. DSRSD envisions dewatering and hauling some portion of their biosolids, at quantities to be determined.
City of Livermore		8,606		8,594		9,137	16.24%	\$ 41.00	
LAVWMA Total	171,403	8,606	177,441	8,594	174,329	9,137			

BIOSOLIDS MANAGEMENT OPPORTUNITY

As noted at the outset of this document, the EBDA and LAVWMA Member Agencies are interested in exploring public-private partnerships to jointly manage biosolids in the future with greater cost-effectiveness, certainty, and control. If deemed feasible, our goal is to have a solution in place in 3-5 years, depending on the complexity and permitting process. Options may include, but are not limited to:

- Purchase of a farm or land that could be used for agriculture for the purpose of land-applying Class B and/or Class A biosolids long term
- Development of a compost facility
- Development of a facility that produces other marketable product(s)
- Hauling agency material to a common site for transfer to end uses or facilities
- Development of a rail option to provide low greenhouse gas transport to lower cost land application sites.
- Potential co-location of a composting site at the Vasco or Altamont Landfill sites in Livermore.
- Combinations of the above strategies.

EBDA is seeking meetings with potential partners interested in exploring this opportunity further. The meetings will take place via Zoom, ideally in January or February, and will be attended by EBDA and agency staff. The meetings are intended as collaborative discussions that will help EBDA and its members determine whether a solution is worth pursuing further, and if so, to outline an effective procurement process.

In these meetings, EBDA expects each potential partner to present their concepts in response to the following topics and questions:

- Provide an overview of your proposed approach, including
 - o Types of strategies and/or facility(ies) contemplated
 - o Location of any processing
 - o Location of end use
- What would you expect the cost to EBDA members to be on a per ton basis? Cost information may be conceptual and based on example projects, and may include ideas on
 - o Expected capital cost (range is acceptable), EBDA's share, and any experience securing grants
 - o Expected O&M cost (including hauling) and EBDA's share
 - o Distribution of responsibilities, including liabilities and ownership, between EBDA and private partner
 - o Information on any grants or funding mechanisms the partner thinks may be applicable
- What is the expected implementation schedule for your proposed project?
- Are there any specific environmental or permitting considerations that impact the feasibility or cost of your proposal?
- What types of entities would you anticipate partnering with to implement this project?
- Are there minimum tonnage commitments you would need to make this project feasible?

- Could the project be expanded to accommodate other agencies beyond EBDA, and how would that change the project economics?

Following these initial meetings, EBDA intends to initiate a more formal procurement process, which will likely include inviting a shortlist of potential partners to prepare more detailed proposals. EBDA expects to provide some level of cost-share for development of the detailed proposals.

EBDA staff is available to discuss questions on this Primer. Potential partners are invited to contact Jackie Zipkin, General Manager, at jzipkin@ebda.org or (510) 278-5910 for additional information and/or to schedule a meeting.

ABOUT EBDA

EBDA was formed on February 15, 1974, by a "Joint Exercise of Powers Agreement" (JPA) entered into by the City of Hayward, City of San Leandro, Oro Loma Sanitary District, Union Sanitary District and Castro Valley Sanitary District (Member Agencies). EBDA operates under a Commission consisting of one representative appointed by each member agency. EBDA's staff includes the General Manager, Operations & Maintenance Manager, and Administration Manager. Additionally, EBDA hires consultants to augment and assist staff in other functions including accounting and engineering services.

EBDA owns and operates three effluent pump stations, a dechlorination facility, and a force main and outfall system for effluent disposal into the San Francisco Bay. Additionally, flow from the effluent pump station owned by the City of San Leandro enters the system, as well as flow from the Livermore-Amador Valley Water Management Agency (LAVWMA) from the Cities of Pleasanton and Livermore and Dublin San Ramon Services District. All of EBDA and LAVWMA's members operate within Alameda County. Figure 1 is a map of the EBDA system.

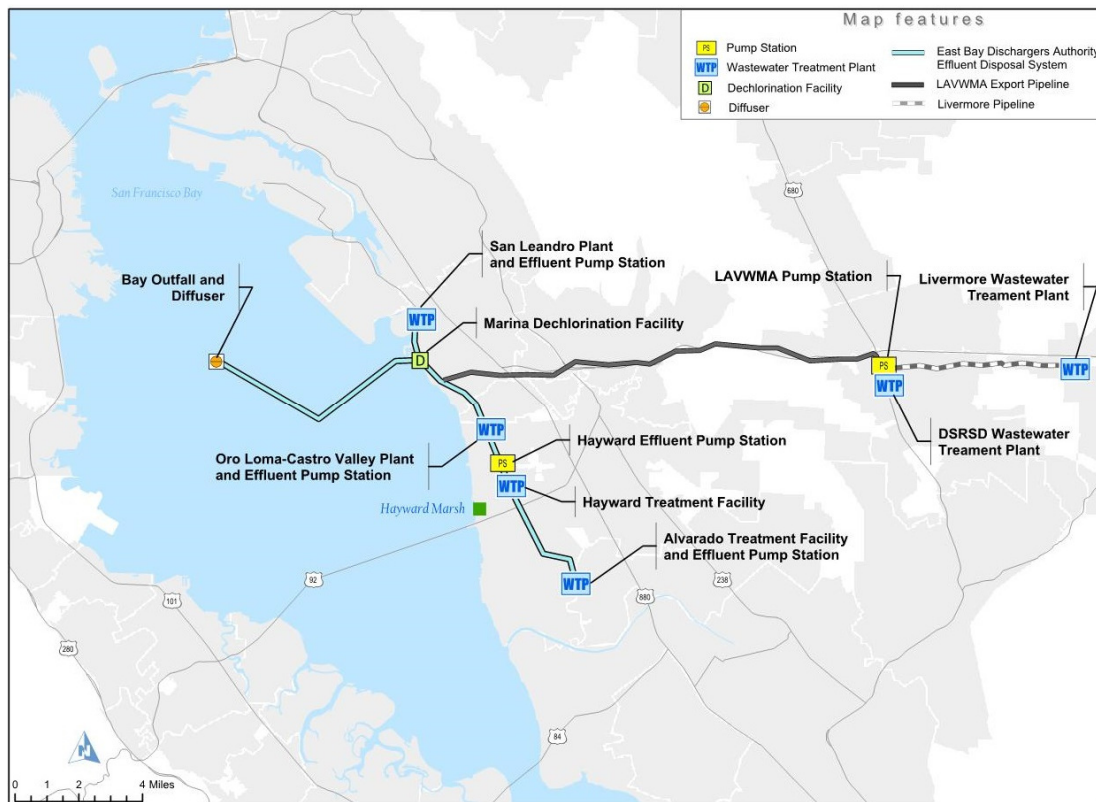


Figure 1 - EBDA System Map