BOARD OF DIRECTORS
EAST BAY MUNICIPAL UTILITY DISTRICT

375 - 11th Street, Oakland, CA 94607 Office of the Secretary: (510) 287-0440

Notice of Time Change

PLANNING COMMITTEE
Tuesday, August 13, 2024
9:00 a.m.
Boardroom
375 11th Street
Oakland, CA 94607

Notice is hereby given that the Tuesday, August 13, 2024 Planning Committee meeting of the Board of Directors has been rescheduled from 9:15 a.m. to 9:00 a.m. The meeting will be held in the Administration Building Boardroom at 375 11th Street, Oakland, California.

Dated: August 8, 2024

Rischa S. Cole

Rischa S. Cole
Secretary of the District

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BOARD OF DIRECTORS
EAST BAY MUNICIPAL UTILITY DISTRICT

375 - 11th Street, Oakland, CA 94607 Office of the Secretary: (510) 287-0440

AGENDA
Planning Committee
Tuesday, August 13, 2024
9:00 a.m.
Boardroom
375 11th Street
Oakland, CA 94607

***** Please see appendix for public participation instructions*****

Committee Members: Directors Marguerite Young {Chair}, April Chan and Doug A. Linney

ROLL CALL:

PUBLIC COMMENT: The Board of Directors is limited by State law to providing a brief response, asking questions for clarification, or referring a matter to staff when responding to items that are not listed on the agenda.

DETERMINATION AND DISCUSSION:

1. Dam Safety Program Annual Report (Terentieff)
2. Los Vaqueros Reservoir Expansion Project Update (Tognolini)
3. Trench Soils Management Update (Yezman)

ADJOURNMENT:

Disability Notice

If you require a disability-related modification or accommodation to participate in an EBMUD public meeting please call the Office of the Secretary (510) 287-0404. We will make reasonable arrangements to ensure accessibility. Some special equipment arrangements may require 48 hours advance notice.

Document Availability

Materials related to an item on this agenda that have been submitted to the EBMUD Board of Directors within 72 hours prior to this meeting are available for public inspection in EBMUD's Office of the Secretary at 375 11th Street, Oakland, California, during normal business hours, and can be viewed on our website at www.ebmud.com.

APPENDIX

Planning Committee Meeting

EBMUD Board committee meetings will be conducted in person and via Zoom.
These meetings are recorded and live-streamed.

*Online**
https://ebmud.zoom.us/j/94576194030?pwd=dWZlc3hNU3JNUVBQYmNKWjJSNVZQdz09
Webinar ID: 945 7619 4030
Passcode: 925293

By Phone
Telephone: 1 669 900 6833
Webinar ID: 945 7619 4030
Passcode: 925293
International numbers available: https://ebmud.zoom.us/u/kdmpbwwlg2

*****To familiarize yourself with Zoom, please visit https://support.zoom.us/hc/en-us/articles/201362193-Joining-a-Meeting

Providing public comment - *The EBMUD Board of Directors is limited by State law to providing a brief response, asking questions for clarification, or referring a matter to staff when responding to items that are not listed on the agenda.*

- Each speaker is allotted 3 minutes to speak; the Committee Chair has the discretion to amend this time based on the number of speakers
- The Secretary will track time and inform each speaker when the allotted time has concluded
- Comments on **non-agenda items** will be heard at the beginning of the meeting
- Comments on **agenda items** will be heard when the item is up for consideration
- The Secretary will call each speaker in the order received

In person
- Fill out and submit a blue speaker card which is available in the meeting room

Via Zoom
- Use the raise hand feature in Zoom to indicate you wish to make a public comment https://support.zoom.us/hc/en-us/articles/205566129-Raising-your-hand-in-a-webinar
  - If you participate by phone, press *9 to raise your hand
- When prompted by the Secretary, please state your name, affiliation if applicable, and topic

Submitting written comments or materials
- Email written comments or other materials for the Board of Directors to SecOffice@ebmud.com
- Please indicate the meeting date and agenda item number or non-agenda item topic in the subject of the email. Contact information is optional.
- **Please email by 4 p.m. the day prior to the scheduled regular meeting**; written comments and other materials submitted to the Board of Directors will be filed in the record.

To *observe* the Planning Committee Meeting,
please visit: https://www.ebmud.com/about-us/board-directors/board-meetings/

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: August 8, 2024

MEMO TO: Board of Directors

THROUGH: Clifford C. Chan, General Manager CCC

FROM: Serge V. Terentieff, Director of Engineering and Construction SVT

SUBJECT: Dam Safety Program Annual Report

SUMMARY

This report is provided in accordance with Policy 9.07 – Dam Safety Program, whereby the District's Chief Dam Safety Engineer (CDSE) provides an annual update on dam safety issues, actions from the previous year related to dam safety, upcoming activities, and an assessment of the adequacy of the budget to cover dam safety needs. The attached report covers the period July 1, 2023 to June 30, 2024. This item will be presented at the August 13, 2024 Planning Committee meeting.

DISCUSSION

During the reporting period, Olujimi O. Yoloye was the District's CDSE, with Elizabeth Z. Bialek as the Alternate CDSE. Ms. Bialek is the acting CDSE until the Federal Energy Regulatory Commission (FERC) approves the District's selection of Serge V. Terentieff, Director of Engineering and Construction, as the District's new CDSE.

The District's Dam Safety Program covers 23 dams; the total number is reduced from what was reported in 2023 because Dingee Reservoir has been permanently removed from service. Regulatory oversight of 18 dams is provided by the California Department of Water Resources Division of Safety of Dams (DSOD). FERC has joint jurisdiction with DSOD over two of the 18 dams (Pardee and Camanche) as they are hydroelectric power-generating facilities. Five District dams are not regulated by DSOD due to their small size. Based on this past year's dam-safety related activities and inspections, the District's dams are considered safe for continued operation.

NEXT STEPS

Progress will continue on all dam-safety related capital improvements and the Dam Safety Steering Committee will continue to meet quarterly. Dam inspections will continue monthly, annual inspections will be conducted with DSOD and FERC, and Emergency Action Planning and Response activities will be scheduled. Updates will be reported in the next annual report.

CCC:SVT:EZB

Attachment: Dam Safety Program Annual Report – July 1, 2023 to June 30, 2024

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DAM SAFETY PROGRAM ANNUAL REPORT
July 1, 2023 to June 30, 2024

HIGHLIGHTS

The Chief Dam Safety Engineer (CDSE) concludes the District's dams are considered safe for continued operation based on the CDSE's knowledge and review of dam-safety-related reports and activities including regular inspections of all facilities and specific engineering studies that were completed by trained engineers, technicians, and inspectors throughout the year, which has been confirmed by the California Division of Safety of Dams (DSOD) and additionally by the Federal Energy Regulatory Commission (FERC) for Pardee and Camanche. Highlights include:

- The construction of the seismic upgrade to Briones Tower was completed in June 2024.
- The planning and design of the seismic upgrade to Lafayette Tower continued.
- The Emergency Action Plans (EAPs) for the District's ten regulated open-cut reservoirs were reviewed by the local emergency management agencies and submitted to the California Governor's Office of Emergency Services (CalOES). In June, CalOES approved six of the ten EAPs and returned four with minor comments.
- The District conducted the five-year recurring Functional, Tabletop, and Seminar exercise for the EAP for Pardee and Camanche Dams on September 20, 2023.

EMERGENCY RESPONSE AND PREPAREDNESS

District Policy 7.03 - Emergency Preparedness/Business Continuity requires an active Emergency Preparedness Program that includes an Emergency Operations Plan (EOP) to manage the District's critical functions during an emergency and protect people, property, and the environment. The EOP guides the District's response in the event of an emergency. Dam-specific EAPs are hazard-specific response plan annexes of the EOP and contain more detailed instructions for staff response. The dam-specific EAPs are overseen by the CalOES and DSOD. FERC also oversees the EAPs for Pardee and Camanche. The District regularly updates these plans and conducts emergency preparedness drills. The following emergency response and preparedness activities took place during the current reporting period.:

- On September 20, 2023, the District conducted a three-part EAP workshop at Pardee Center that consisted of the following:
    - Annual Seminar: provided a refresher on the contents of the EAP, which included a review of the dam emergency conditions and notification charts.
    - Tabletop Exercise: trained attendees on emergency preparedness, including roles and responsibilities and a mock scenario.
    - Functional Exercise: allowed attendees to navigate a hypothetical high-flow event through role playing.

- In December 2023, the District updated the EAP for Pardee and Camanche facilities. The annual revisions included updates to the notification chart, incorporation of CalOES comments, and expanded narratives to clarify current protocols. The revised FERC EAP

was distributed to all stakeholders in January 2024. CalOES review of the Pardee and Camanche EAPs continues.

- On May 2, 2024, the District participated in the Contra Costa County Emergency Operations Center (EOC) Earthquake Functional Exercise. District staff developed injects for the exercise for hypothetical scenarios at San Pablo Dam and Briones Dam and observed how the dam related injects were addressed by participants.

- CalOES approved EAPs for six of the District's ten regulated open-cut reservoirs in June 2024: Maloney, North, Almond, Leland, Sobrante CW, and Argyle 2, and provided comments on the EAPs for the remaining four reservoirs: Dunsmuir, Central, Moraga, and Danville. The District responded to comments and resubmitted the remaining four EAPs in June 2024.

- Staff updated the Earthquake Annex to the Emergency Operations Plan (EOP) in June 2024 and submitted it to the District's Emergency Operations Director. The Earthquake Annex is a Hazard Specific Annex to the EOP, and it includes information on the District's response and recovery from potential damage to its facilities including dam safety emergencies.

DAM SAFETY STUDIES AND IMPROVEMENTS

The following are key highlights from the District's current and upcoming dam safety capital projects and studies.

Ninth FERC Part 12D Independent Consultant Inspection and Potential Failure Mode Analyses – The District submitted the final Part 12D revised summary of findings reports to FERC in July 2023, and transmitted the schedule and plan of actions to implement the Independent Consultant (IC) recommendations on October 26, 2023. FERC responded to the District's proposed plan in a letter dated April 17, 2024 with comments on the schedule and a request for confirmation that the IC concurred with the District's proposed approach for surveillance of the Camanche northern dikes during high water levels. The District responded in a letter dated May 17, 2024, with justifications for the schedule and a commitment to provide the IC's concurrence by July 2024.

Mokelumne River Dam Breach Inundation Maps – The District prepared new sunny-day dam breach inundation maps for each water-retaining structure/facility at Camanche and Pardee reservoirs. These updated maps satisfy FERC guidelines and DSOD criteria for inundation mapping, thereby creating one unifying inundation map series that meets dual-regulatory oversight. These updated inundation maps were transmitted to FERC on June 26, 2024 and will be transmitted to DSOD in July 2024.

Briones Tower Modifications – The modifications to prevent damage to the tower in the event of an earthquake were completed in June 2024. The improvements include the installation of steel-strip reinforcement in the upper portion of the tower to limit concrete cracking and damage during an earthquake, the installation of a debris catcher to prevent earthquake-induced falling concrete and other debris from damaging the valves required to drain the reservoir, and the installation of onshore remote operation for the tower reservoir drain valves to improve operational response time following an emergency. DSOD approved the project, and the District will submit final paperwork to DSOD before their deadline of October of 2024.

Lafayette Tower Modifications – The tower at Lafayette Reservoir is unique in that it functions as the spillway and outlet works to safely control the reservoir levels. As reported in previous years, the tower presents a significant dam safety concern. In the event of an earthquake, the tower is likely to sustain significant damage due to the lack of steel reinforcement in the concrete and the conduits, which are buried within the dam, and would sustain damage such that the tower and conduits would not be able to perform their function as a spillway and outlet. There are at least three dam safety concerns, which are not acceptable to the District and DSOD.

- Earthquake damage to the tower could obstruct the outlet or prevent the District's ability to open the valves, which would prevent lowering of the reservoir following an earthquake.
- Damage to the tower below the water surface level could drain the reservoir through the spillway causing an uncontrolled high-flow release into Lafayette Creek.
- Damage to the spillway conduit could allow water to flow into the embankment, washing out soil leading to a potential dam failure.

The District reevaluated the seismic safety of its dams and towers following updates to the local seismic hazard in the early 2000s. This effort identified dams and towers that required upgrades, which were then systematically completed based on the risk and operational needs, including the need to provide water following an earthquake. Major upgrades included: San Pablo Dam Seismic Upgrades (2010), Chabot Dam Seismic Upgrade (2017), Upper San Leandro Reservoir Tower Seismic Upgrade (2018), and Briones Outlet Tower Seismic Upgrade (2024). Lafayette Tower is the last major seismic upgrade in the District's dam safety program.

DSOD is requiring the District address the seismic safety of the tower and conduit and add an onshore valve operating system to improve response time in an emergency. The District performed extensive analyses of the Lafayette Tower and evaluated several retrofit alternatives, including some that would maintain the original height of the tower. Those tall tower alternatives were, unfortunately, not able to meet the seismic loads. The seismic deficiencies were identified in a comprehensive structural evaluation of the tower and conduit system using state-of-the-practice finite element numerical modeling and dynamic response-spectrum analysis. Based on these results, and after conducting an alternatives analysis, the District and DSOD agreed that the safest and most reliable way to address the seismic risk is to shorten the tower by 40 feet. This result is consistent with the DSOD's independent analysis of the tower.

In February 2023, members of the Lafayette community sent the District a conceptual design that proposed to add a 55-foot-tall steel structure to the top of the shortened tower. The District reviewed this alternative but found that it would not meet the functional needs of the tower and presented structural and cost concerns. Specifically, the steel portion would deform out of phase with the concrete tower and would increase the shear at the base of the tower. These results were shared with the Lafayette City Council in May and June of 2023. The same members of the community sent the District renderings of a lightweight metal operating house to the top of the shortened tower, which has been incorporated into the District's design.

During the reporting period, the District continued to work with the City of Lafayette and its citizen's advisory committee (the City). The City proposed an alternative to reinforce the top half of the tower. The District, with its consultant, performed significant analyses of the City's proposed retrofit and

found it to not be structurally viable for a dam spillway structure. The District and its consultant subsequently developed a concept for retrofitting the full height tower with steel strip reinforcement. Although potentially viable, a taller tower would impart approximately 50 percent more load onto the conduit, and require a substantial retrofit to the conduits, presenting a higher risk and a significantly higher cost (estimated to be $8 million dollars more) and would further delay construction leading to additional cost increases.

At the City's request, the City met with DSOD on August 7, 2024 where the District was an observer. During the meeting, DSOD presented the rationale for their analysis, which follows well-established design standards for dam facilities and is based on sound structural engineering principles. The City requested DSOD consider options to maintain the height of the tower, which included options such as adding a new spillway, replacing the existing control house with a lightweight control house, and a version of a concept that would dampen seismic response, all of which the District has previously considered and analyzed but ultimately found not to be viable because those options presented either higher levels of complexity and risk, significant constructability challenges, and/or were found to be prohibitively expensive with extensive environmental impacts. DSOD indicated that although they would consider additional alternatives advanced by the District, any alternative would need to be reliable, constructable, and meet technical standards for dam structures. DSOD also emphasized that the project needed to advance in a timely manner.

During the meeting, DSOD reaffirmed their criteria, which are by necessity conservative because Lafayette Dam and tower are considered extremely high risk, with significant potential impacts and loss of life. Additionally, because the tower is the sole spillway for the facility, it must remain functional after an earthquake. The City acknowledged that DSOD has done their own independent review of the District's design, but suggested that they hire a peer reviewer team to complete an independent analysis to review their difference in technical analysis and look for additional solutions to maintain a tall tower. Although DSOD confirmed that they would consider other alternatives, if proposed by the District, DSOD informed the City that "numerous studies completed over the past 30 years have concluded that reducing the tower height is an efficient solution". DSOD also stated that independent peer review panels are typically only required for large, complex projects or when unconventional approaches are proposed by the dam owner. DSOD stated that this was not the case for the Lafayette Tower since they are in agreement on the District's alternative to shorten the tower, and DSOD stated that a peer review panel is therefore not warranted.

Terminal Dam Spillway Condition Assessments – The Dam Spillway Condition Assessment program includes a comprehensive evaluation of each dam's spillway, including 1) underdrain evaluations, 2) video, smoke, and drone surveys, 3) non-destructive testing, 4) wall displacement evaluations and 5) the installation of survey monuments and other instrumentation. During the reporting period, work at the spillways included wall displacement analyses under earthquake loading using computer modeling. The evaluations showed that at San Pablo and USL spillways, a gap could form between the wall and the soil backfill, potentially leading to erosion under high groundwater conditions. To check the modeling assumptions and results, the District is performing detailed surveying of the walls, including advanced Light Detection and Ranging (LiDAR) surveys. These results will be used in the assessments. The District is also performing a spillway condition assessment by visually inspecting and sounding the concrete for potential areas of delamination, and is planning to perform non-destructive test such as Slab Impulse Response (SIR), impact-echo testing, and surface penetrating radar. Based on the results of these additional studies, the District will develop a plan for remedial action, if needed.

Upcountry Dam Spillways Condition Assessments and Upgrades – At the concrete-lined segment of the Pardee Spillway, the District is currently developing a Pardee Spillway Condition Assessment Program following the recommendations from the Ninth FERC Part 12D Report. The District has taken proactive measures in performing spillway studies, and Pardee Spillway is the last spillway to receive a formal condition assessment as it was more recently upgraded in 2003.
The recommendations were based on field observations of the concrete condition. The condition assessment program will include field investigations and non-destructive concrete testing.

For the concrete-lined segment of the Camanche Spillway, *The Camanche Spillway Phase 2 Condition Assessment Program Report* was transmitted to DSOD in June 2023, and included coring of the concrete-lined chute, detailed mapping of cold-weather joint inspection, and mapping of the extents of unobstructed subdrain lines and locations of subdrain obstructions. The District is preparing a work plan to install flow deflectors at the subdrain outlets and plans to submit the work plan to FERC and DSOD in early 2025.

At the unlined segment of Pardee Spillway, the District collected aerial drone-based LiDAR survey data of the Pardee Spillway unlined channel in response to the recommendations in the Eighth FERC Part 12D Report. The results showed no appreciable scour or erosion between 2019 and the fall of 2021 because the spillway was not operated. No survey was performed in the fall 2022 because the spillway was not operated. The Pardee Spillway was operated for over 120 days from December 2022 through July 2023, and the District collected a third LiDAR data set in November 2023. The District estimated the scour, erosion, and rockfall quantities that occurred between 2021 and 2023, and found that there was approximately 1,470 cubic yards of erosion, rockfall, and scour and approximately 800 cubic yards of material deposited in the channel. These results, which do not present a concern at this time, were documented in the 2023 Annual Dam Safety Surveillance and Monitoring Report submitted to FERC and the Annual Dam Safety Report submitted to DSOD. In coordination with the UC Berkeley Center for Smart Infrastructure, the District will continue monitoring and surveying at the Pardee Spillway unlined channel and plans to develop engineering models with predictive estimates for future erosion, scour, and rockfalls. The model results may demonstrate the need to upgrade at the unlined channel to limit erosion, and if so, the District will plan and budget for spillway improvements.

The unlined segment of Camanche Spillway has erosion from precipitation surface runoff and, because the spillway has experienced only infrequent minor spillway flow events, the performance of the unlined segment under high flows is unknown. The District developed a two-dimensional hydraulic model of the spillway with estimated flow rates in the lined and unlined spillway channel under variety of flow levels and plans to develop a three-dimensional model. The results of these hydraulic models will be used to analyze potential scour and erosion that could lead to undermining of the concrete-lined chutes within the buried Folsom South Canal pipeline that crosses the unlined channel. These analyses will be performed, and preliminary design alternatives developed, as part of this project in Fiscal Year (FY) 2027/FY 2028.

Upcountry Probable Maximum Flood Studies – The District submitted a letter to FERC in December 2023 proposing to perform a site-specific probable maximum precipitation (SS-PMP) study for the Mokelumne River watershed jointly with PG&E, and to develop a probable maximum flood (PMF) estimate based on the SS-PMP. FERC responded in April 2024, concurring with the District's proposal and requesting a meeting with the District and PG&E to discuss a work plan with

the project specifics. The District previously submitted a PMF study in April 2022 that was based on the National Oceanic and Atmospheric Administration's more-general PMP estimation for California. FERC acknowledged that the District would revise the PMF that was submitted in April 2022 based on the SS-PMP. Staff updated the Planning Committee on March 12, 2024 with the District's plan for extreme precipitation events and climate change resilience, which includes completing the SS-PMP and PMF and updating the emergency preparedness program with the results of these studies. Further updates will be provided as this effort progresses.

Camanche and Pardee Seismic Study – The District continued working with its consultant to complete the seismic and flood loading studies for Pardee and Camanche dams and spillways in compliance with FERC requirements. The study includes seismic stability for a) Camanche valve house, b) Pardee Dam, c) Camanche and Pardee South Spillway crests, d) Camanche Spillway chute walls, and e) Camanche Spillway bridge, and it includes the April 2022 PMF loading for the stability studies of Pardee Dam, Pardee South Spillway Crest, and the crest, chute walls, and chute slab of Camanche Spillway. The seismic hazard analyses report, which is the initial document establishing the basis for the seismic loading, was submitted to FERC and DSOD in July 2023. In January 2024, DSOD accepted the seismic loading for Pardee and requested that the District adjust the seismic loading at Camanche. The District revised and resubmitted the report, and DSOD accepted the result in March 2024. FERC has not yet commented. However, using the DSOD-approved seismic study and the April 2022 PMF study, the seismic and flood loading study for the Pardee and Camanche dams is being prepared with the comprehensive study scheduled for submittal to FERC in March 2025. Early results indicate that there are no significant concerns.

Camanche and Pardee Surveillance Improvements Program – The District submitted the *Piezometer Evaluation Report and Programmatic Improvement Plan* to FERC in 2022 and DSOD in 2023 to abandon 121 piezometers, install new multi-level piezometers at 15 locations, and update existing standpipe piezometers with modern electronic probes at Pardee and Camanche Dams. This work supports FERC Part 12D recommendations and is based on collaborative efforts with FERC and DSOD. FERC and DSOD tentatively approved the 2022 plan and requested that the District file Drilling Program Plans for Camanche and Pardee to document the drilling means and methods, geologic cross sections, field logging, quality control and quality assurance, and measures taken to ensure safe dam drilling and instrumentation installation. These will be submitted to FERC and DSOD in the summer of 2024. The DSOD submittal will include a Dam Alteration permit to begin the field work.

Camanche Outlet Works and Pardee Dam ROV Inspections – The Ninth FERC Part 12D Report recommended performing underwater remote-operated-vehicle (ROV) inspections of the Camanche Low-Level Outlet Conduits, Camanche High-Level Outlet Conduit, and the upstream face of Pardee Dam. These facilities have not been thoroughly inspected since they were constructed. These inspections will address and inform Potential Failure Modes for the upcoming Tenth Part 12D Inspection. The District has developed a work plan to retain the services of divers and underwater ROV operator to collect information on the condition of these facilities. A technical report will be prepared with the findings and distributed to FERC and DSOD.

Dam Safety Program Guide – The District revised the Dam Safety Program Guide in May 2024 to incorporate FERC comments. Revisions included additional details on the District's dam safety program to reflect current practices, personnel changes, updates to the non-FERC jurisdictional dam inventory, and minor text revisions to improve readability.

DAM INSPECTIONS, SURVEILLANCE, AND REPORTING

Staff performs monthly dam inspections. Staff also collects monthly dam safety surveillance instrumentation data. Geotechnical engineers review the inspections and issue maintenance work orders or develop capital projects as necessary, and evaluate the instrumentation data to ensure there are no dam performance concerns. In addition, the District conducts annual inspections with FERC and DSOD and submits annual reports.

The dates for the latest DSOD inspections, valve exercises, and reports for the last year are shown in Table 1, and the dates for the FERC inspections and reports are shown in Table 2. Except for routine maintenance, such as vegetation clearing and concrete patching, no major problems were identified.

UPCOMING ACTIVITIES

In addition to the seismic retrofit work on the Lafayette Tower, the upcoming dam safety activities for next fiscal year will continue the focus on spillway evaluations, including the start of a new Pardee South Spillway Condition Assessment program. Dam safety activities will also include performing rehabilitation, repairs, and upgrades to the surveillance and monitoring programs, following recommendations from the Eighth and Ninth FERC Part 12D inspections. Activities include performing corrective maintenance in response to FERC and DSOD inspection report comments on routine maintenance. Specific items are the USL and Chabot Watershed Flood Studies and Spillway Evaluations, Briones Reservoir Piezometer Replacement, Dam Safety Training, and Research Studies, as described below.

USL and Chabot Watershed Flood Studies and Spillway Evaluations – The District is planning to develop a comprehensive hydrometeorological model of the San Leandro Creek Watershed for impacts on USL Reservoir and Chabot Reservoir. After developing the model, the District will perform an SS-PMP and PMF study. The results of the SS-PMP study will be used to update the PMF. The PMF will be used as the flood loading to determine the hydraulic adequacy of the spillways at USL and Chabot reservoirs. In addition, the District will perform a Probabilistic Flood Hazard Analysis (PFHA) to assess the various levels of floods, their expected frequency, and their hazard. The analyses will also include three-dimensional computation fluid dynamics numerical models, and potentially physical models, of USL and Chabot Spillways to evaluate the performance of the current spillway systems and to evaluate spillway design alternatives. The District is in communication with DSOD on this effort to ensure the analyses will meet any new DSOD requirements, including climate change sensitivity analysis.

Local Reservoirs Surveillance Improvements – The District is planning rehabilitation and upgrades to surveillance and monitoring instruments at the local reservoirs. The identified improvements for 2024 to 2030 include Briones Dam piezometer rehabilitation, Lafayette Dam piezometer rehabilitation, Briones left abutment drainage structure, and Upper San Leandro survey benchmark access improvements.

The first phase being carried out is the Briones Dam piezometer upgrades. Pneumatic piezometers were installed at Briones Dam during the original construction in 1964 to monitor groundwater pressures in the embankment. The mechanical components of the pneumatic piezometers have begun to fail, including the diaphragms, gas lines, and gas gages, and the remaining working pneumatic

piezometers are subject to failure in the coming years. The District is developing a plan to abandon the pneumatic piezometers and replace them with new grouted-in-place vibrating wire piezometers, which are a widely-used modern solution. The District is working with DSOD on approval for the overall project scope and approach and is anticipating design in 2025 with construction in 2026.

Dam Safety Training – During the reporting period, the District updated the learning modules for the Dam Safety Training Program and developed online versions. Training will be provided in FY 2025 for new employees, and refresher training will be available for current employees. The training content and schedule are outlined in the District's FERC-approved Dam Safety Program Guide.

Research Studies – As part of its ongoing innovation efforts, the District is working with the UC Berkeley Center for Smart Infrastructure to perform research studies related to dam safety. Working with academic researchers, the District plans to study the stability and scour potential of the unlined channel at Pardee South Spillway and development of additional Rapid Post-Earthquake Dam Inspection Criteria. These research projects will assist the District and advance the Districts' dam safety infrastructure and emergency response.

Dam Operational Upgrades – The District is developing plans to perform rehabilitation and upgrades at the USL Dam Blowoff Structure and Chabot Energy Dissipator. These structures are used to release water to San Leandro Creek to lower reservoir levels and require upgrades. In addition, upgrades are being planned to install flow deflectors over the subdrain system at Camanche Spillway and a seismic shutoff valve on the Sobrante Aqueduct in the tunnel below San Pablo Dam.

FISCAL IMPACT

Funds from ongoing capital and operating budgets have sufficiently supported the efforts of the Dam Safety Program and additional funding will be requested as part of the FY 2026 /FY 2027 Capital Budget. The Dam Safety Program Steering Committee reviews the budget as part of its ongoing work and will recommend adjustments as needed.

Table 1: FY 2024 DSOD Dam Inspections, Reports, and Valve Exercises

Dam Name	DSOD Inspection Date	DSOD Report Date[(a)]	DSOD Valve Exercise[(b)]
Almond	2/28/2024	6/28/2024	2/28/2024
Argyle #2	2/14/2024	6/28/2024	2/14/2024
Briones	10/23/2023	6/28/2024	5/15/2024
Camanche	10/17/2023	6/28/2024	9/24/21
Central	2/15/2024	6/28/2024	2/15/2024
Chabot	2/28/2024	6/28/2024	12/15/2021
Danville	2/29/2024	6/28/2024	2/29/2024
Dunsmuir	2/28/2024	6/28/2024	2/28/2024
Lafayette	10/23/2023	6/28/2024	12/9/2021
Leland	2/29/2024	6/28/2024	2/29/2024
Maloney	2/14/2024	6/28/2024	2/14/2024
Moraga	2/29/2024	6/28/2024	2/29/2024
North	2/14/2024	6/28/2024	2/14/2024
Pardee	10/17/2023	6/28/2024	10/25/2022
Piedmont	2/15/2024	6/28/2024	(c)
San Pablo Clearwell	11/22/2023	(d)	(d)
San Pablo	4/25/2024	6/28/2024	4/25/2024
Sobrante Clearwell	2/14/2024	6/28/2024	2/14/2024
Upper San Leandro	2/15/2024	6/28/2024	12/14/2021

Notes:

a) The annual DSOD report for local dams is up to date with the next report planned for July 1, 2025.

b) Valves are required to be exercised every three years. The valve exercise program is up to date.

c) Reservoir is out of service and is empty.

d) San Pablo Clearwell has been demolished and DSOD removed the facility from jurisdiction in December 2023.

Table 2: FY 2024 FERC Dam Inspections and Reports

Dam Name	FERC Inspection Date	Report Date
Camanche	09/12/2023 to 09/13/2023	04/12/2024
Pardee	09/13/2023 to 09/14/2023	04/12/2024

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EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: August 8, 2024

MEMO TO: Board of Directors

THROUGH: Clifford C. Chan, General Manager CCC

FROM: Michael T. Tognolini, Director of Water and Natural Resources MTT

SUBJECT: Los Vaqueros Reservoir Expansion Project Update

SUMMARY

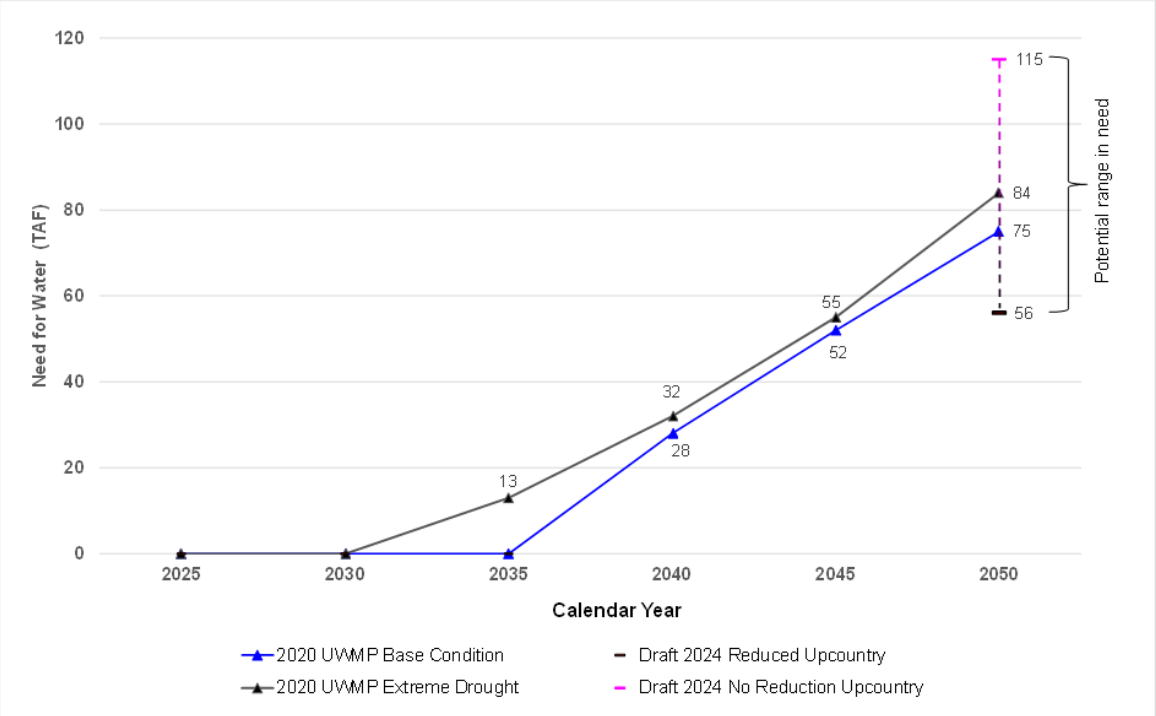
The District has been evaluating potential participation in the proposed Los Vaqueros Reservoir Expansion Project (LVE Project) that would provide the District up to 30 thousand acre-feet (TAF) of new supplemental water storage for droughts and emergencies. Recently, the Contra Costa Water District (CCWD) requested each Los Vaqueros Reservoir Joint Powers Authority (JPA) member to decide on their participation in the LVE Project by this fall. The District is a regional partner with the Bay Area water agencies and is supportive of the regional benefits that the LVE Project provides. Staff recommends the District remain a JPA member without any allocated storage, and convey water for the JPA member agencies including providing a backstop for CCWD during the construction of the LVE with District approval and full reimbursement. This item will be presented at the August 13, 2024 Planning Committee meeting.

DISCUSSION

A draft 2024 update to the need for water analysis in 2050 was conducted, which is based on the District's 2050 Demand Study and accounts for conservation, water recycling, rationing, and Central Valley Project (CVP) supplies. The draft 2024 update indicated that in the third year of a drought, the amount of additional water that could be needed is between 56 and 115 TAF under two scenarios, with and without a potential reduction in upcountry demands on Mokelumne River supplies. The 2024 draft update will be refined as the 2025 UWMP is developed, including updating the approach to modeling climate change.

Figure 1 shows the draft 2024 update in 2050 along with the need for water between 2025 and 2050 from the 2020 Urban Water Management Plan (UWMP) under the base condition and extreme drought scenarios.

*Figure 1. Need for Water in Third Year of Drought: 2020 UWMP and Draft 2024 Update**



*Accounts for conservation, recycling, CVP supplies in Years 1 and 2, and 15 percentage rationing being implemented. Draft update assumes CVP supply is not available in drought Year 3.

Supplemental Water Supply Alternatives

The water supply portfolio alternatives to meet the need for water based on the District's three-year drought planning sequence can be grouped into the following:

- Alternatives that provide supply every dry year: water transfers (when available), non-potable recycled water, and potable reuse. Note that future non-potable recycled water is accounted for in the need for water calculation.
- Options that provide supply during a third year of a drought: LVE, San Joaquin County (SJC) groundwater banking, and Bayside Phase 2.

The potential yield and key considerations of the supplemental supply alternatives are summarized in Table 1. Green, yellow, orange, and red indicate the progression from more favorable to less favorable.

Table 1. Potential Future Supplemental Water Supply Sources

Supply Alternatives	Dry Year Yield (TAF)	Key Considerations	Outcome Control	Implementability	Supply Assurance	Unit Cost
Water Transfers	Up to 47 TAF when available	Quantities are variable; market transfers less reliable as drought deepens. Healthy Rivers and Landscapes Program relies on transfers, so future market will be tighter.	●	●	●	●
Future Non-potable Recycled Water	Up to 11 TAF	Included in the need for water analysis (to be updated in Recycled Water Strategic Plan).	●	●	●	●
Potable Reuse	TBD (9 to 34 TAF preliminary draft)	Long lead time for education and outreach and to develop project; complex permitting and operations.	●	●	●	●
LVE	20 TAF	Can be more resilient in year 3 and beyond of a drought; project risks.	●	●	●	●
SJC Groundwater Banking	TBD (Up to 20 TAF)	Permits, wells, and blending ratios in aqueducts may limit extraction capacity and required spreading over multiple years to achieve yield.	●	●	●	●
Bayside Phase 2	TBD (5 TAF)	Continued outreach to address community concerns.	●	●	●	●

WSMP: Water Supply Management Program

Based on the draft need for water and the water supply options available to the District, the District may be able to meet the future need without LVE if water transfers are available and SJC groundwater banking is implemented. However, to account for uncertainties in the future need for water, other supply options should also be evaluated including additional water transfers or potable reuse.

Dry Year Unit Costs

Dry year unit costs for the water supply alternatives are shown in Figures 2(a) and 2(b). Figure 2(a) provides the unit costs for future potential supplemental supplies that could supply every dry year. Costs already incurred by the District (e.g., construction of the Freeport facilities) are not

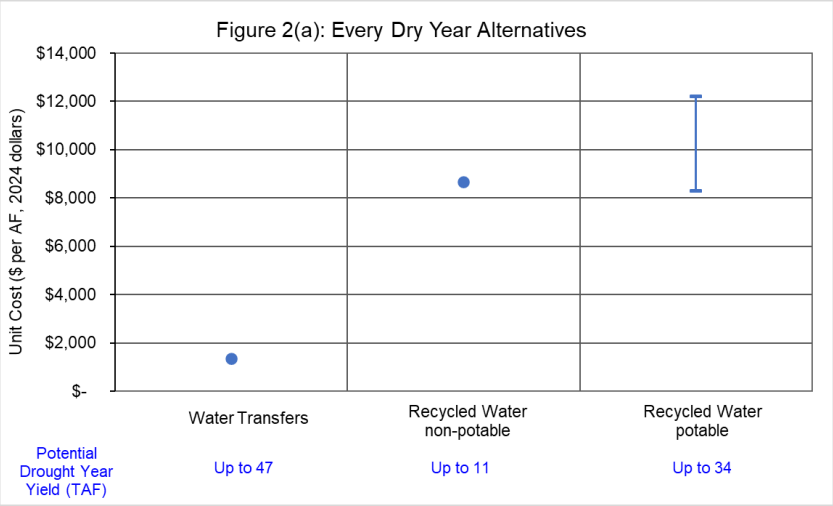
included in the unit costs for water transfers. Figure 2(b) provides the unit costs for potential future storage projects that would typically only operate during the third year of a drought.

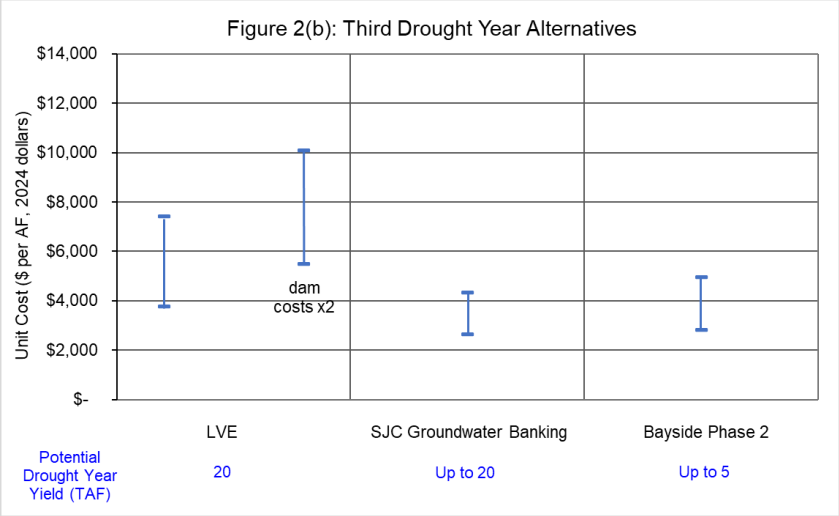
The recycled water projects unit costs in Figure 2(a) are calculated assuming they operate for 3 dry years out of 10, an assumption that is used in the WSMP 2040. While these projects operate every year, the dry year unit cost is calculated using the yield in 3 dry years out of 10 for comparison to dry year only projects.

The alternatives in Figure 2(b) are provided as a range because of the uncertainty in the drought use frequency, which is assumed to range between 1 in 8 years to 1 in 15 years based on hydrology over the past 20 years and 90 years, respectively. To address dam construction risk associated with LVE, unit costs assuming the capital cost of the LVE dam construction doubles is also shown. The unit costs for SJC groundwater banking are based on preliminary concepts developed with North San Joaquin Water Conservation District and Stockton East Water District. The unit costs for Bayside were re-calculated using the WSMP 2040 capital and operations cost assumptions and the potential yield only during operation in a third year of drought.

Of the alternatives that provide supply in a third year of a drought, LVE is the most expensive option.

Figures 2(a) and 2(b): Dry Year Unit Costs





LVE Project Agreements Status

Staff have spent a significant amount of time in the past year to develop and negotiate the key LVE Project agreements, and resolve other issues such as updating the Project cost evaluation and exploring the sources of water supply for the project. Staff, along with the other member agencies and the JPA, have met multiple times with CCWD to resolve concerns with the agreements; however, the issues still remain.

On June 11, 2024, CCWD sent a letter to the General Managers of JPA member agencies requesting clarification on their commitment to the Project. The letter also summarized CCWD's firm position on the key outstanding issues in the agreements between the JPA and CCWD. Staff does not recommend the District accept the current terms of the agreement because they require the District and the other JPA member agencies to take on all the financial and liability risks of the dam construction along with the risk of not receiving expected supplies with no control to mitigate the risks.

LVE PROJECT PARTICIPATION CONSIDERATIONS

CCWD has requested decisions on LVE Project participation by the fall of this year; however, the schedule calls for project commitments by April 2025. Several options for the District are provided below.

- Option 1: District does not participate in the LVE project. Without the LVE Project, the District has other supplemental supply options, but each has uncertainties and limitations that may impact the ability to meet the District's future need for water. Limited supplemental supply alternatives exist for a third year of a drought (storage). The District may be excluded from participating in the Project in the future if it exits the JPA.

- Option 2: The District could participate at its original storage request of 30 TAF or a reduced amount. The District's share of the capital costs would be at least $200 million (for 30 TAF). A reduced storage request would decrease the District's cost share. However, in either case, the District would still have to accept the risks outlined above under "LVE Project Agreements Status."
- Option 3: The District could remain a JPA member without any allocated storage. The District may have to pay JPA administration fees (to be negotiated) but would not pay any costs for the Project and therefore reduce its financial liability. The District could, in the future, pursue a temporary or permanent assignment of available storage capacity and conveyance rights from another JPA member agency through the reallocation provision that is contemplated in the Service Agreement.

With or without allocated storage in the LVE Project, the District can participate in the Project by conveying water for the JPA member agencies using Freeport and receiving appropriate financial compensation for services offered. Member agencies have indicated that entering into the EBMUD Facility Usage Agreement for water conveyance using Freeport is more appropriate on a case-by-case basis and that an agreement between the JPA and the District is not needed at this time. The District can also convey water through Freeport as part of its Backstop Plan for CCWD during LVE construction.

The JPA has allocated $23.7 million of the California Water Commission (CWC) grant funding for the Project to the District to upgrade the Walnut Creek Pumping Plant (WCPP) so the District can better facilitate water conveyance for the member agencies using the Freeport facilities. Because the member agencies have indicated that conveyance by the District is not needed in the near term, the JPA may decide to reallocate the $23.7 million to other Project facilities, especially under Option 3. If the District does not receive the CWC grant funding and conveys water in the future for the member agencies, the full cost of the upgraded WCPP facilities will be used when calculating the District's usage fees. Furthermore, if the facilities are not upgraded, the District will have more restrictions on conveying water for the member agencies.

RECOMMENDATIONS

Staff recommends Option 3, to remain as a JPA member without any allocated storage. This option allows the District to support the LVE Project and remain in the JPA. This option also allows time for the District to complete its updated demand study and UWMP to determine its future need for water, while still preserving the District's access to storage in LVE if it becomes available in the future under better agreement terms. Staff also recommends participating by potentially conveying water for the JPA member agencies including supporting CCWD and the JPA during construction and refill of LVE with full reimbursement to the District.

The District is a regional partner with the Bay Area water agencies and is supportive of the regional benefits that the LVE Project provides. Staff also recommends that the District continue to plan for future droughts, reduce demands with water conservation and non-potable recycling,

and develop supplemental water supplies including water transfers, underground storage, and if necessary, potable reuse as a part of the District's diversified water supply portfolio.

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EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: August 8, 2024

MEMO TO: Board of Directors

THROUGH: Clifford C. Chan, General Manager CCC

FROM: Crystal J. Yezman, Manager of Maintenance and Construction CJY

SUBJECT: Trench Soils Management Update

SUMMARY

Replacement and maintenance of the District's water distribution pipelines currently generates approximately 50,000 cubic yards (CY) of trench soils annually. In 2020, the District prepared a Trench Soils Master Plan and began evaluating and piloting strategies to improve management of the trench soils. An overview of the activities in the past year will be presented at the August 13, 2024 Planning Committee meeting.

DISCUSSION

Staff last updated the Planning Committee on the District's Trench Soils Master Plan at its June 13, 2023 meeting. During the meeting, staff presented various strategies to manage the trench soils, with a goal to reduce the reliance on District-owned stockpile sites, reduce soil generation, address community concerns, and reduce greenhouse gas emissions while not impacting the District's Pipeline Rebuild Program.

Existing Trench Soils Management Practices

During construction and maintenance of the District's pipelines, excavated soil is hauled to one of three District-owned temporary stockpiles near Briones Reservoir in Orinda, below Upper San Leandro (USL) Reservoir off of Miller Road north of Castro Valley, and in San Ramon near Amador Reservoir (the Amador site is used infrequently). When the stockpiles near capacity, soil is removed for permanent disposal at other locations. This practice results in "double-handling" of the soil, first when it is placed at the temporary stockpile and then when it is permanently disposed.

Briones Stockpile

The Briones site is the largest with a capacity of 563,000 CY. The latest off haul at this site began in April 2024. Through August 1, 2024, approximately 192,000 CY (14,880 truckloads) of soil has been removed. The offhaul work will be completed by August 9 and is estimated to

remove a total of 211,000 CY of soil. Trucking operations through the City of Orinda have been carefully coordinated with the City to minimize disruption to the community. Soil from the latest off haul was beneficially reused at the Dumbarton Quarry (Fremont), Conco Company (Martinez), and Oyster Bay Regional Shoreline (San Leandro). The timing and volume of future offhauls will depend on the availability of nearby beneficial reuse sites.

Miller Road Stockpile

The Miller Road site has a capacity of 123,100 CY and is nearly at capacity with an estimated 114,000 CY currently stockpiled. The District is planning to remove soil from the Miller Road stockpile site in summer 2025. This operation requires a conditional use permit from Alameda County and completion of California Environmental Quality Act (CEQA) documentation. Staff plan to discuss the project, including proposed mitigations to address impacts, with the local communities in early 2025.

Off haul of this soil through Castro Valley could be reduced if the District and Alameda County are able to partner on a project near the stockpile site. In January 2023, a significant landslide damaged Redwood Road about one mile north of Miller Road. Alameda County plans to begin road repair later this month and needs approximately 8,000 CY of soil. The District is working with County staff on acceptance criteria for utilizing the Miller Road stockpile soils for the landslide repair. This transfer could eliminate over 1,300 truckloads through Castro Valley.

Alternative Methods to Reduce Use of Stockpile Sites

Options for managing the District's trench soils include direct hauling to end use sites, amending native soil for reuse in the trench, and trenchless pipeline installation to reduce the soil produced during construction. The District's long-term goal is to reduce its reliance on its temporary stockpile sites and reduce the cost of trench soils management. These goals will largely be achieved through direct hauling to beneficial reuse sites, though on-site reuse of trench soils and trenchless construction will, to a much lesser degree, help achieve these goals.

The following sections update the progress on the evaluation of the alternative methods.

Direct Hauling to Beneficial Reuse Sites

Direct hauling to end-use sites for beneficial reuse or directly to a permanent landfill avoids double-handling of soils. These options require a broker to ensure the daily (and sometimes hourly) timing of soil generation at construction sites matches availability of disposal sites. Additionally, all soil must be carefully characterized and documented to meet the acceptance criteria of disposal sites.

District staff have acted as the soil broker to coordinate trench soils hauling between District construction and prospective reuse sites. Pacific States, the District's trench soils management contractor for the District's temporary stockpile sites, also provides assistance in identifying

permanent disposal sites. The District has been actively piloting a direct haul operation to the Dumbarton Quarry in Fremont utilizing Pacific States since January 2024. Through July 31, 2024, approximately 5,760 CY (576 truckloads) of soil have been directly disposed, representing approximately 11 percent of the District's annual trench soils generation. Once filled, the Dumbarton Quarry will be transferred to the East Bay Regional Park District (EBRPD) for development into Phase 2 of the Dumbarton Quarry Campground, which is expected to continue until the year 2035.

Due to the limited number of reuse sites currently under contract, preliminary costs for the direct haul pilot are similar to costs associated with using temporary stockpiles with subsequent off haul for final disposal. Cost will lower as more reuse partners are developed and the practice is optimized. Even with neutral cost savings, the environmental and community impacts are lower.

The District is actively pursuing other beneficial reuse sites (summarized below). In the future, the District plans to have four to five available sites to directly haul trench soils. This flexibility will reduce hauling mileage and will ensure timing compatibility among multiple construction sites and disposal sites.

Potential Beneficial Reuse Partner Sites

Site Name	Use	Volume (CY)	Location
Dumbarton Quarry	Public park	3,000,000	Fremont
Redwood Road	Landslide repair	8,000	Redwood Road, Alameda County
Montezuma Wetlands	Wetlands restoration	12,000,000	Sacramento-San Joaquin Delta (via Port of Richmond and contractor barge)
Eden Landing (Measure AA)	Wetlands restoration	200,000 to 600,000	Hayward
Supply Bank (Oakport)	Raise site elevation	22,000	Oakland
North Bay Logistics	Soil regeneration for agricultural purposes	TBD	Livermore
Emeryville Crescent	Wetlands restoration	TBD	Emeryville

On-site Reuse of Trench Soils (Native Soil)

To reduce disposal volumes, portions of excavated trench soils may be able to be placed back into the trench with appropriate treatment. Reusing native soil as backfill requires amending the soil with additives to increase compaction strength to meet jurisdictional requirements. However, even under ideal conditions, only 30 to 40 percent of the soil can be reused because the remaining backfill must be sand or gravel to meet engineering specifications. Preparing soil for reuse involves adjusting moisture levels and mixing with concrete slurry. This process increases construction time and requires additional construction space, which can increase community

impacts. The District is negotiating with a vendor and selecting a job site that will utilize a nearby staging area for soil amendment. This project will be completed as a proof of concept and reuse 600 CY. If successful, a larger pilot project will be considered in 2025.

Native soil reuse is currently being used at another District construction site for the USL Water Treatment Plant Reliability Project. At this site, the contractor is amending soils from the Briones stockpile to create a native slurry backfill for onsite use. The project will utilize approximately 10,000 CY from the Briones stockpile.

Trenchless Construction

Trenchless pipe construction is possible through a variety of methods including pipe bursting, horizontal directional drilling, slip lining, and with cured-in-place pipe (CIPP). Each reduces open trench construction and corresponding soil removal, but application to District work is limited due to utility congestion, shallow ground cover, and the need to restore service laterals. Pipe bursting, directional drilling, and slip-lining for small diameter pipelines also requires the use of plastic pipe which is not the District's preferred pipeline material.

The District plans to rehabilitate up to 2.5 miles of pipelines using CIPP in 2025 and 2026. These projects are ideal for CIPP because open trench construction would be very difficult, the pipes do not need to be increased in size, and there are few service connections at these locations. Projects have been identified in the cities of Berkeley, El Cerrito, Oakland, Richmond, and San Leandro.

NEXT STEPS

The following is a summary of next steps planned for the next year.

- Board considers awarding a contract to Montezuma Wetlands, LLC for direct hauling to Port of Richmond (October 2024 Board meeting)
- Board considers awarding a CIPP construction contract (January 2025 Board meeting)
- Miller Road Temporary Disposal Site
    - Conduct public outreach for Miller Road off haul to support permitting application and completion of CEQA (February 2025)
    - Adopt CEQA for Miller Road conditional use permit with Alameda County (March 2025 Board meeting)
- Update the Planning Committee on trench soils management (March 2025)
- Continue to operate the District's temporary trench soils stockpile sites (i.e., Briones, Miller Road, and Amador), as needed
- Continue to pilot and evaluate alternative trench soils management methods

CCC:CJY:sd