

# San Francisco Bay Conservation and Development Commission

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August 11, 2023

**TO:** Engineering Criteria Review Board (ECRB) Members

**FROM:** Lawrence J. Goldzband, Executive Director (415/352-3653; larry.goldzband@bcdc.ca.gov) Jenn Hyman, Senior Engineer (415/352-3670; jennifer.hyman@bcdc.ca.gov) Sam Fielding, Senior Environmental Scientist (Permit Analyst) (415/352-3665; sam.fielding@bcdc.ca.gov)

**SUBJECT:** **Cargill’s Solar Sea Salt System Maintenance and Operations Project, Newark, Alameda County – Berm Stability (BCDC Permit Application No. 2021.003.00)**  
(For Board consideration on August 30, 2023)

## Project Name

Cargill’s Solar Sea Salt System Maintenance and Operations Project (BCDC Permit Application No. 2021.003.00)

## Project Representatives

Connie Lee, Senior Land Management Engineer, Cargill, Inc.  
Don Brown, Land Resources Manager, Cargill, Inc.  
Gina Young, Senior Lawyer, Cargill, Inc.  
Matt Pitcher, Solar Plant Manager, Cargill, Inc.  
Christine Boudreau, Boudreau Associates  
Chris Carr, Partner, Paul Hastings  
Michael Whelan, P.E., Principal Geotechnical Engineer, Anchor QEA

## Project Components under Review in this Meeting

Berms at Cargill – Newark Plant 2: Ponds P2-12 and P2-13 (the Mixed Sea Salt or MSS Ponds)

## Project Description

On April 28, 2021, Cargill, Inc. submitted an application to the San Francisco Bay Conservation and Development Commission (BCDC) for the “Solar Sea Salt System Maintenance and Operations Project” (O&M Project), BCDC Permit Application No. 2021.003.00, to continue maintenance and operational activities at Cargill’s solar salt facilities located in Newark, Fremont and Redwood City over a ten-year authorization period. BCDC is the lead agency for preparation of a California Environmental Quality Act (CEQA)-compliant draft Environmental Assessment, which is under development.<sup>1</sup>

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<sup>1</sup> The Environmental Assessment is being prepared pursuant to BCDC’s certified regulatory program under CEQA. (14 CCR § 15251(h); reference also 14 CCR §§ 11520-25.)

BCDC Permit No. 1993.004.20 (with a time extension 1993.004.21 issued on December 19, 2022), currently authorizes Cargill to conduct ongoing operations and maintenance activities at its system of solar salt ponds in Alameda and San Mateo Counties through December 31, 2023 or until a new BCDC permit is issued, whichever is earlier. Since it was originally granted, the permit has gone through 15 time extensions, without changes to the authorizations and conditions. The BCDC permit for the ten-year O&M Project (BCDC Permit Application No. 2021.003.00), if authorized, would replace Permit No. 1993.004.21 with an updated set of authorizations and conditions to reflect consistency of Cargill's proposed continuance of its existing operations and maintenance activities with BCDC's current laws and policies.

While the O&M Project would include a wide range of activities throughout the approximately 12,100-acre project site, the Board's review of the O&M Project will focus on the earthen berms surrounding Ponds P2-12 and P2-13 at Cargill's Plant 2, which currently store approximately 4 to 6 million tons of Mixed Sea Salt (MSS). MSS is a layered solid matrix, with some entrained liquid bittern, comprised of salts remaining following Cargill's commercial precipitation and harvesting of NaCl and liquid bittern (concentrated MgCl<sub>2</sub> brine). More information about MSS and its relevance to the proposed O&M Project is found in the section titled "Mixed Sea Salts (MSS)" below. Due to its high salinity (350 to 600 parts per thousand (ppt); ocean water is about 35 ppt), and the fact that its ionic balance differs from Bay water, brine such as MSS "could contribute to potential environmental impacts if overtopping, scour, and erosion caused a release of brine to the Bay" (AECOM 2021).

### **Project Site and Existing Conditions**

Cargill's current salt pond operations encompass an approximately 12,100-acre-area (Project Site) in the cities of Newark and Fremont (Alameda County), and Redwood City (San Mateo County). Of the 12,100 acres, Cargill currently owns approximately 4,100 acres in fee title and has operating rights on approximately 8,000 acres within the Don Edwards National Wildlife Refuge (lands that Cargill transferred to the United States Fish and Wildlife Service (USFWS) for conservation purposes). The Project Site is composed of the following: the three primary production plants (Newark Plant 1, Newark Plant 2, and the Redwood City Plant); Baumberg Ponds B-3C; and the Cargill West Bay areas (brine pipeline alignment, including the Transbay section of the pipeline, and the Redwood City Maintenance Pond SF-2 Donut).

Cargill's solar salt system is separated from the Bay, streams, and flood control channels by a system of approximately 123 linear miles of earthen berms, of which approximately 62 miles are "outboard" berms abutting the Bay, sloughs, and tidal marsh habitats. According to Cargill, these earthen berms were first constructed at various times and by various salt production companies between the 1860s and the 1950s. They were constructed of mostly native materials excavated from within the salt ponds and completed prior to the development of modern civil engineering standards.

The berms that are the focus of the Board's review are those surrounding Ponds P2- 12 and P2-13 at Newark Plant 2, which store the MSS material. Pond P2-12 is approximately 250 acres in size, bound by a berm of approximately 19,000 linear feet. Pond P2-13 is approximately 400 acres in size, bound by a berm of approximately 23,000 linear feet. The outboard berms

are adjacent to either tidal sloughs (Newark Slough, Plummer Creek) or tidal marsh within San Francisco Bay. Based on aerial imagery identified by BCDC staff, most of the P2-12 and P2-13 berms were originally built sometime between approximately 1946 and 1956.

The berms are maintained by Cargill by applying gravel to the top to improve drivability. Where seepage is observed in adjacent tidal wetlands, berms are also improved using a technique called “berm core compaction” or “berm coring”. At Ponds P2-12 and P2-13 where berm coring is applied, a 30-inch wide trench is dug down to a depth of up to 9 feet. The excavated core section is backfilled with low-permeability clean imported material that is compacted in place. This technique generally halts seepage of brine into the tidal marsh.

The MSS material in the ponds is primarily a solid matrix, 4-5 feet thick, with approximately 20% entrained brine. After rain events or when new liquid bittern is added to the ponds (before the salts precipitate out), liquid accumulates in the ponds on top of the solid salts. According to Cargill, Ponds P2-12 and P2-13 have over two feet of freeboard that could accommodate several decades of additional MSS inventory or an influx of Bay or flood waters. (This information was provided separately by Cargill and not substantiated in the Package.) Photos taken on June 7, 2023 by Jenn Hyman, BCDC Senior Engineer, from a tour provided by Cargill to Ponds P2-12 and P2-13 are provided in Attachment A.

### **First ECRB Meeting November 16, 2022 and Purpose of this Meeting**

Given the historic nature of the construction of these berms, the extent of geotechnical information and site-specific analysis provided by Cargill, and the ecological risk associated with potential release of the MSS material contained within P2-12 and P2-13, BCDC staff requested the ECRB’s input as to the current seismic stability of the P2-12 and P2-13 berms and how Cargill’s proposed maintenance activities may affect the berms’ integrity. Furthermore, given the information in the Sea Level Rise Assessment (AECOM 2021) identifying these ponds as a priority concern, BCDC staff further requests the ECRB’s input as to how the risk of future overtopping due to sea level rise and storms could also affect the berms’ integrity.

The first meeting of the ECRB to discuss the Cargill O&M Project was held on November 16, 2022. In this meeting, the Board learned about the Project, heard presentations from Cargill and requested specific studies be performed to better understand the berm stability and risks of a release. A large packet of background information was provided, and continues to be relevant to the topics in this second meeting. The letter from BCDC to Cargill dated December 20, 2022, details data requested in the first ECRB meeting, numbered 1-7, and is provided in Attachment B.

The Board will review the following reports submitted by Cargill in response to requests by the ECRB in their first meeting and detailed in the letter (as items 1-5):

1. Geotechnical Investigation Workplan by Anchor QEA dated June 2023;
2. Memo on Updated Cross Sections, Berms at Ponds P2-12 and P2-13 by Anchor QEA dated June 27, 2023;
3. Summary of the History of P2-12 and P2-13 Berms, by Cargill Inc.;

4. Cover letter by Boudreau Associates to BCDC dated July 31, 2023 stating that the ecological and human health risk analysis requested by the ECRB is satisfied by the conclusion (in Anchor QEA's Assessment of Static and Seismic Stability Condition of Berms) that the risk of berm breach and MSS release is unlikely under conservative scenarios, so there is no ecological risk for Cargill to analyze; and
5. Assessment of Static and Seismic Stability Condition of Berms by Anchor QEA dated July 31, 2023.

BCDC staff requests that the Board review the content provided and advise on the following, considering the permit duration of at least 10 years<sup>2</sup>:

1. Are the scenarios and criteria in the static and seismic berm stability adequate for assessing the risk of berm failure at Ponds P2-12 and P2-13?
2. Do the static (Item #4 in the letter in Attachment B) and seismic stability (Item #5a in the letter in Attachment B) calculations for the berms adequately characterize and model the berm stability, considering the available geologic data and berm history, including any berm raising to address subsidence and sea level rise and 6 inches of sea level rise predicted for 2030?
3. Does the scope in the geotechnical workplan provide data to increase the confidence of the geologic model used in stability modeling and do you recommend updating the berm stability modeling following the execution of the workplan (Item #1 in the letter in Attachment B)?
4. Does the Updated Cross-Section Memo with the 2 cross-sections adequately address the ECRB request for site-specific surveys and cross-sections of the berms considering the risks of berm failure related to both seismic stability and erosion from overtopping (Item #2 in the letter in Attachment B)?
5. Does the Summary of the History of P2-12 and P2-13 Berms adequately address the request for this information (Item #3 in the letter in Attachment B)?
6. Do you agree that the results of the berm stability modeling indicate that an ecological and human health risk analysis (#5b and 5c in the letter in Attachment B) is not needed?
7. Does the Board have any other concerns regarding berm stability that have not been addressed?

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<sup>2</sup> While Cargill's current permit application only proposes a ten-year term, the existing permit (1993.004.20) was also only originally authorized for an initial ten year period starting in 1995 but has been amended and extended for the past 28 years. Although Cargill represents that its separate MSS project is intended to transition storage from MSS from Ponds P2-12 and P2-13 to mix with effluent from the East Bay Dischargers Authority (EBDA) for eventual discharge into the Bay, realization of this project is not a certainty. Furthermore, Cargill has not publicly stated any intentions to otherwise cease use of Ponds P2-12 or P2-13 (independent of the MSS project) or any intentions to cease its saltmaking operations in general (and thus its need for future, ongoing operations and maintenance activities of its saltmaking facilities). Considering the above, while the current permit application only proposes a ten-year term, any approval of Cargill's permit application engenders BCDC policy concerns beyond a ten-year horizon, as reflected in the considerations that BCDC staff is requesting that the Board consider.

### **In a Future Meeting**

The last item, Item #7 in in the letter in Attachment B, requesting an Updated Sea Level Rise Risk Assessment, will be presented in a future ECRB meeting.

### **References**

- AECOM, Final Cargill Sea Level Rise Assessment, April 27, 2021.

### **Attachments**

- A: Photos taken June 7, 2023 of Ponds P2-12 and P2-13 by Jenn Hyman, BCDC Senior Engineer
- B: Letter from Schuyler Olsson of BCDC to Tim Oolman of Cargill Inc. dated December 20, 2022, regarding Next Steps and clarification of application filing requirements based on discussion at BCDC Engineering Criteria Review Board Meeting on November 16, 2022.