Citizens Committee to Complete the Refuge

P.O. Box 23957, San Jose, CA 95153 Tel: 650-493-5540 Email: cccrrefuge@gmail.com www.bayrefuge.org

Sent via electronic email only

Bay Conservation and Development Commission
Attn: Sam Fielding
375 Beal Street, Suite 510
San Francisco, California 94105
Email: *sam.fielding@bcdc.ca.gov*

23 September 2024

Re: Recirculated Draft Environmental Assessment Cargill, Incorporated Solar Sea Salt System Maintenance and Operations Activities

Dear Mr. Fielding,

These comments are submitted on behalf of the Citizens Committee to Complete the Refuge (CCCR) in response to the Recirculated Draft Environmental Assessment Cargill, Incorporated Solar Sea Salt System Maintenance and Operations Activities (Draft EA). Thank you for the opportunity to provide comments. We request that you incorporate into the comments for this version of the Draft EA the following:

1) June 8, 2021 CCCR comment letter to BCDC regarding the previous version of the Draft EA [Attachment 1],
2) the November 12, 2022 Save the Bay/CCCR letter addressed to the BCDC Engineering Criteria Review Board (ECRB) [Attachment 2],
3) an email dated June 9, 2021 with recommendations of how to fill void spaces in riprap to avoid harboring predators and non-native species,
4) a November 11, 2014 Memo from Dr. Peter Baye to the South Bay Salt Pond Restoration Project regarding the potential to use gravel beach restoration/creation as an alternative to the use of riprap in areas subject to wave erosion,

4a) A KMZ file providing the location of an example of a gravel barrier

Additionally, CCCR had requested a copy of a comment letter from the San Francisco Bay Regional Water Quality Control Board (Water Board), should one be submitted. We agree with the comments made by the Water Board.

According to the Draft EA, the document provides environmental review of Cargill's solar salt operations and maintenance activities that include:

1) "continue conducting various activities necessary to maintain the integrity and stability of earthen berms, water control structures, and other infrastructure associated with salt-making to ensure continued viability of salt production activities;
2) allow for implementation of preliminary sea level rise adaptation efforts, including studies; and
3) permit Cargill to develop and implement alternative maintenance methods, that may further reduce the effects of maintenance activities on the environment, improve efficiency, and/or adapt to changing climate conditions where appropriate."

Actions that are currently occurring under a BCDC permit that was originally issued in 1995 (Permit No. 1993.004.19) include:

- Maintenance of salt pond berms, various salt-making equipment, and pipes and ditches used to move brine;
- Minor excavation to provide access to repair and replace berms and other facilities, including use of locks;
- Making salt pond berms drivable,
- Removal of sediment at Bay water intakes,
- Import of clean soil and concrete, and
- Minor modifications to internal berms including re-establishing vehicle access on some internal berms by replacing existing gaps with culverts and bridges

According to the Draft EA the following changes will be made in the level of existing activities:

- Reducing berm keying from approximately four miles over a 10-year period to two miles over a 10-year period.
- Increasing lock access from approximately one event per year to slightly more than two events per year.
- Increasing the amount of berm maintenance. As more berms are made drivable, the average amount of maintenance is anticipated to increase from an annual average from 31.5 miles/year to 37 miles/year over the proposed 10-year Project term: however, the Draft EA then states that "at the end of the 10-year permit period, up to 41.5 miles of drivable berm would require maintenance annually."
- Increasing the number of structure repairs from approximately three major repairs per year to a total of up to 12 major and minor repairs per year.
- Increase from an average of approximately 80 CY of outboard riprap placement per year to up to approximately 1,050 CY per year.
- Decrease from an average of 480 CY per year of riprap placement on interior berm slopes to approximately 175 CY per year.
- Placement of up to approximately 100 CY per year of new riprap (riprap in areas that previously did not have riprap) on outboard berm slopes. This quantity was not tracked separately from riprap repair on outboard berm slopes in the past.

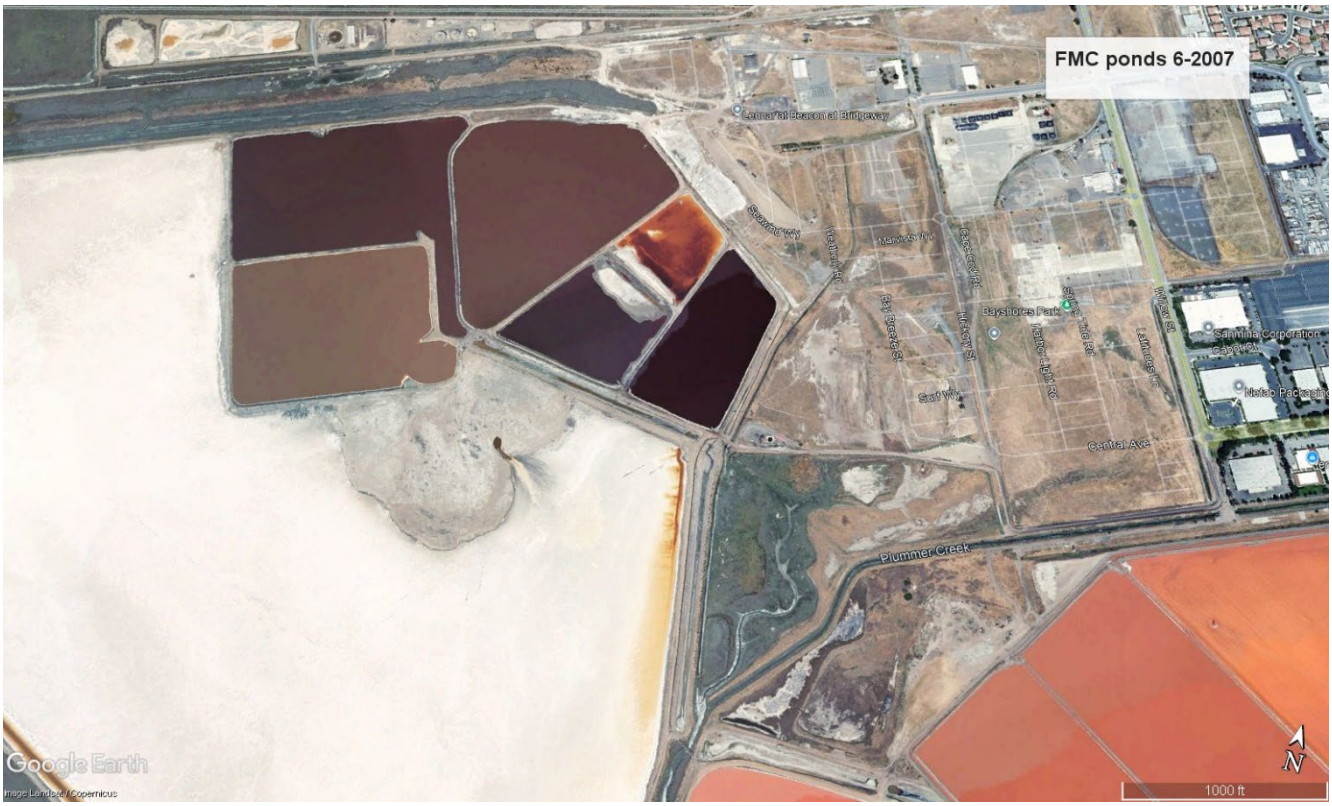
And lastly, the Draft EA states the proposed Project includes "new berm maintenance activities related to sea level rise adaptation as well as new protections for special status fish at Cargill's Bay intakes, including:

1. Proposed construction and operation of fish screens for one or more pumps at Cargill's intake along Alameda Creek (Alameda Flood Control Channel) to minimize potential impacts on special status fish species, and a monitoring plan to evaluate the need for fish protection measures at other intakes and identify appropriate protection measures as needed.
2. Implementation of additional best management practices to further avoid and/or minimize potential effects on sensitive species.
3. Increasing the height of the berms around Ponds P2-12 and P2-13 by up to six inches, as needed, to ensure the berms are at an elevation of 11.5 feet NAVD88 by 2034 to address sea level rise.
4. Placement of up to 7,800 square feet of new riprap (i.e., riprap in areas that were not previously covered by riprap) over the life of the permit.

Based upon our review of the Draft EA, we have the following comments:

The DEA states that the most recent permit was issued in 1995 and that a series of extensions and amendments have been issued since that time. We urge the Bay Conservation and Development Commission (BCDC) to establish a firm lifespan of no more than 10-years for the forthcoming Salt Pond O & M permit authorization. As we stated in response to the original EA for this Project, in an era of rising sea levels, and with more intense and frequent storm events, it would be prudent to reassess the impacts of actions along the edges of the Bay much more frequently than has previously occurred.

2.10.6.12 Minor Fill and Excavation – The concluding statement of this section states, "Specific criteria would be defined in the permit; these quantities and scope of these minor fill and excavation events would be consistent with or less than the baseline period." Does this mean specific criteria will be defined in the special conditions of the O & M permit? Without this information, how can the public comment on whether these fills and excavations are truly "minor"?



Is the deposition in June 2007 considered a "minor fill"? The EA should provide limits on what would be permitted as a "minor fill." The Corps Nationwide Permit 18 – "Minor Discharges" places a limit of 25 CY and less than 1/10-acre.

How are "minor fills" reported? They don't appear in the tables provided in the Draft EA. The square footage, volume, location, habitat impacted is information that should appear in the Annual Work Plan that is submitted for review and approval by the agencies, and should be included in the completed work report.

2.13 Best Management Practices for Maintenance Work:

- Berm Maintenance – 7: California Ridgway's Rail (RIRA) and avoidance during emergency berm maintenance – The BMP states that during "emergency berm maintenance Cargill will avoid, to the extent practicable, creating disturbances to tidal marsh habitat." There is no mention of notification of the U.S. Fish and Wildlife Service (USFWS) or California Department of Fish and Wildlife (CDFW) after the action has occurred, though that language appears in ES and SNR-4: Emergency Access, "…Cargill will follow BCDC's emergency permit procedures to obtain clearance for the proposed work. Notification will be provided to the USFWS and CDFW prior to any emergency access, including the location and reason for the access." For consistency similar language should be added to Berm Maintenance – 7. In addition, all emergency work should be monitored by a qualified biologist.
- Berm Maintenance-3: Spills – If "spillage occurs onto the marsh plain" the spillage should be assessed by a qualified biological monitor, who will prepare a report for USFWS, CDFW, BCDC, the U.A. Army Corps of Engineers (Corps), San Francisco Bay Regional Water Quality Control Board

(Water Board), and NMFS, detailing the location of the spillage, the volume of the spill, the square footage of the marsh plain impacted, along with a proposed corrective action for review and approval by the agencies. In the event the agencies determine it is best to leave the material in place, monitoring should be required to ensure adverse impacts to the surrounding marsh does not result.

2.13.2 Riprap Placement:

- Riprap Placement-1: Nature-Based Solutions (NBS) – What are the criteria for assessing whether or not the implementation of NBS are "feasible"? Are there actual instances where NBS have been selected over the default to utilizing riprap?
- Riprap Placement-3: Minimize Voids – The wording of this BMP does little to alleviate the concern that with the use of riprap, particularly in locations that are adjacent to potential salt marsh harvest mouse (SMHM) habitat, there will not be sufficient voids to harbor predators and non-native species. Placement of riprap in and of itself is inadequate to remove voids that support predators and nuisance species. Please see Attachment 3, a memo from Dr. Peter Baye that discusses the placement of gravel within the voids.
- Riprap Placement-6: Agency Notification – Similar to the question above, have there been actual instances where the use of riprap proposed in an Annual Work Plan, has been discouraged or denied?
- If areas of repeated riprap replacement exist (riprap failure/loss), it should be required that the method of berm protection for those locations be re-evaluated to determine if a better solution exists.

2.13.4 Lock Access/Egress:

- Lock Access/Egress-1: Environmentally Sensitive Areas Identified in Work Plan – In addition to identifying environmentally sensitive areas in the Annual Work Plan, all work conducted in these areas must be monitored by a qualified biologist.
- Lock Access/Egress-5: Seal Pupping 500-Foot Buffer – A qualified biologist must be the entity that checks for pupping activity prior to work being conducted within 500 feet of any known haul out location.

2.13.5 Endangered Species and Sensitive Natural Resources (ES and SNR):

- ES and SNR-5: Lock Access – A qualified biological monitor should be on-site during lock access and egress.
- ES and SNR-8: Nesting Western Snowy Plover (SNPL) and California Least Tern (LETE) Nesting Survey: These surveys must be performed by a qualified biologist, and not Cargill staff, unless Cargill staff are acknowledged by CDFW and USFWS as a qualified biologist. The qualified biologist will conduct the nesting surveys, record the locations of nesting birds and provide that information to the pertinent agencies.
- ES and SNR-9: Seal Pupping Buffer – This BMP must be modified to require that a qualified biologist check for pupping activity and monitor any work conducted at the 500-foot buffer.
- ES and SNR-21: Monitoring and Treatment of Potential MSS Seepage – If potential seepage of MSS is suspected, the method of addressing areas with potential seepage in the Annual Work

Plan must be reviewed and approved by BCDC, the Corps and the Water Board and the agencies should review and approve the plans before they are implemented.

3.4.4.1 Impact BIO-1: Substantial Adverse Effect on Candidate, Sensitive, or Special-Status Species:-

Effects of Earthen Berm Maintenance, Materials Stockpiles, Riprap Placement, Weed Management, and Other Infrastructure Maintenance on Special-Status Species –

Treatment of outboard berms for ponds P2-12 and P2-13:
We support actions that would ensure leakage, seepage, etc. into surrounding wetlands and the Bay, from the MSS (bittern) ponds P2-12 and P2-13 is prevented. To address the issues of overtopping of the outboard levees and the threat of sea level rise/wind wave forces, Cargill is proposing to raise the elevation of the levees to 11.5 feet NAVD 88 by the end of the 10-year permit period.

Questions of the ability of the outboard berms to withstand overtopping, erosion, and failure in a seismic event are issues of concern that have been voiced regarding the potential release of MSS into the surrounding wetlands and waters of the Bay from the P2-13 and P2-12 Ponds [Save the Bay/Citizens Committee to Complete the Refuge letter dated November 12, 2022 to the ECRB – attached].

Questions raised at the most recent Engineering Criteria Review Board (ECRB) meeting included the inputs for the modeling used to determine total water levels, the deformation analysis, and others. Have these issues been addressed to the satisfaction of BCDC staff and the ECRB? P2-12 and P2-13 are adjacent to Newark Slough and surrounded by high value tidal wetlands, that support the SMHM and RIRA, and the Bay waters adjacent to these ponds are Green Sturgeon Southern DPS Critical Habitat Estuaries, Essential Fish Habitat for Pacific Coast Salmonids and Coastal Pelagic Species and Pacific Coast Groundfish. These high value tidal wetlands and Bay waters must be protected against releases of MSS from ponds P2-12 and P2-13. It would be premature to conclude that the proposed sea level rise/seismic safety plans are adequate and will not result in significant adverse impacts to adjacent tidal wetlands and waters of the Bay.

Filling berm gaps:
In our response to the 2021 EA, we raised the ecological concern of making most inboard berms drivable - the intention is that this will move the maintenance operations towards the use of land-based equipment instead of having to dredge through tidal sloughs and through tidal wetlands to access dredge locks to facilitate maintenance of pond levees. We applaud the effort to move towards the use of land-based equipment, however, the analysis of impacts to roosting and nesting waterbirds was inadequately addressed in the Draft EA. The Draft EA anticipates that approximately 4 gaps would be filled per year with a total of 40 gaps during the life of the permit approval.

Again, we do not disagree with the movement towards the use of land-based equipment where possible, we are concerned by the assessment, with only the briefest explanation, that this is not a significant impact for waterbirds. Please refer to Attachment 1 for an explanation of our concern and why we urge a more thorough analysis of the impacts this action might have on migratory and resident, nesting and roosting, waterbirds. We urge that at minimum, compensatory mitigation such

as the creation of nesting islands in ponds where internal berm gaps will be made drivable, to provide waterbirds with nesting and roosting habitat that is not accessible by land-based predators.

Addition of up to an estimated 7,800 square feet of new riprap on outboard marshes:
The BMPs suggest that nature-based solutions will be implemented where feasible, but provide no criteria of how NBS would be selected over the use of riprap. The Draft EA should include examples of the types of NBS that may be suitable for the segments of shoreline within the Biological Study Area (BSA). Please refer to Attachments 4 and 4a, which provide an example of an alternative to use in place of riprap that is within the BSA.

Figure 206. Riprap Placed on Outboard Side of Berm

The image above is taken from the Draft EA. What monitoring if any, will be required when new riprap is placed on the outboard side of levees? This particular photo is concerning as the new riprap is placed right up to existing tidal wetlands habitat. It must be required, if new riprap is installed

instead of utilizing NBS, that the impacts of the riprap on adjacent tidal wetland be monitored. That a corrective action plan be developed for the review and approval of regulatory and resource agencies, and that corrective measures be implemented. If corrective action is not possible, compensatory mitigation should be required and should be at a ratio that considers permanent loss of existing habitat and the temporal loss that will occur until the mitigation area has met its success criteria.

Mitigation Measure BIO-1: Minimize Potential for Brine Seepage – Has the BCDC Engineering Criteria Review Board reviewed and approved of Cargill's proposed methods of "keying or other measures" for preventing brine and bittern seepage?

Fish Screens or Lack Thereof:

It is rather stunning and very disconcerting to learn that Cargill has been operating its intake pumps without the requirement of fish screens to avoid entrainment, injury, mortality of listed and sensitive species. It is obvious that fish screens should be put into place at the intake pump on the Alameda County Flood Control Channel. The Draft EA says:

> "Proposed construction and operation of fish screens for one or more pumps at Cargill's intake along Alameda Creek (Alameda Flood Control Channel) to minimize potential impacts on special status fish species, and a monitoring plan to evaluate the need for fish protection measures at other intakes and identify appropriate protection measures as needed."

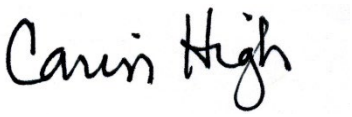
Why only one pump, why not all of the pumps on Alameda Creek, especially since tremendous effort has gone into restoring conditions favorable for federally threatened steelhead trout and potentially the longfin smelt, recently listed as endangered under the federal Endangered Species Act (ESA)? Why aren't fish screens being proposed for more intake pumps? Have USFWS, NMFS, and CDFW agreed this is an appropriate approach? Is the proposed monitoring plan completed? Have the agencies had an opportunity to review and approve the plan? Will the public have the opportunity to review and comment on the monitoring plan? The Draft EA seems to imply that a monitoring plan has not been developed yet, "…Cargill intends to develop and implement a monitoring program." If a monitoring plan has not been developed, reviewed and approved by the agencies, the adverse impacts of the intake pumps on federal and state listed species cannot be assumed to be mitigated to a level that is less than significant. Will the agencies require Incidental Take Permits and will that be required before any permit is issued? What does the sentence, "Complete fish screen designs, permitting, and installation is likely to require several years," mean? Does this mean that O & M permit might be issued before the matter of when and where the fish screens will be installed are time certain? What is the plan for monitoring the efficacy of the fish screens after implementation?

2.13.7 Effectiveness of BMPs:
We have indicated our concerns regarding some of the BMPs above. The last assessment of the effectiveness of the BMPs was conducted for the period 2010-2015. BCDC should require that a new assessment be conducted as a requirement of any permit authorization. With the increasing threat of sea level rise, and increasing flashy and intense storm events, it would be prudent to monitor the effectiveness of the BMPs under changing climatic conditions.

Based upon our review of the DEA and the prior 2016 WRA analysis of BMPs, the lack of clarity on what constitutes a “minor fill,” the proposed placement of new riprap on outboard levees with no clear direction about how the use of NBS “where feasible” should be interpreted, the lack of adequate information regarding where and when fish screens will be installed, etc., it is evident that not all impacts of the proposed Salt Pond O & M activities have been fully analyzed nor the impacts to biological resources sufficiently identified. This should be rectified before BCDC considers permit issuance, as the permit duration is 10-years, and the missing information is substantive. We have also suggested additional BMPs that should be required.

We thank you for the opportunity to provide comments and ask that we be kept informed of future opportunities to review and provide comments on this project.

Respectfully submitted,



Carin High
CCCR Co-Chair

Attachment 1

Citizens Committee to Complete the Refuge

P.O. Box 23957, San Jose, CA 95153 Tel: 650-493-5540 Email: cccrrefuge@gmail.com wwsw.bayrefuge.org

Sent via electronic email only to schuyler.olsson@bcdc.ca.gov

Bay Conservation and Development Commission 8 June 2021
Attn: Schuyler Olsson, Coastal Program Analyst
375 Beal Street, Suite 510
San Francisco, California 94105
Email: schuyler.olsson@bcdc.ca.gov

Re: Notice of Notice of Intent to Finalize an Environmental Assessment for the Cargill, Incorporated Solar Salt System Maintenance and Operations Activities Project

Dear Mr. Olsson,

These comments are submitted on behalf of the Citizens Committee to Complete the Refuge in response to the Notice of Intent (NOI) to Finalize the Draft Environmental Assessment (DEA) for the Cargill, Incorporated Solar Salt System Maintenance and Operations Activities Project (Cargill salt pond O & M project). Thank you for providing additional time to review additional documents that were received May 28th.

Based upon our review of the EA and on the permitted activities and permit conditions in BCDC Permit No. 4-23 we have the following comments:

The DEA states that the most recent permit was issued in 1995 and that a series of extensions and amendments have been issued since that time. We urge the Bay Conservation and Development Commission (BCDC) to establish a firm lifespan of no more than 10-years for the forthcoming Salt Pond O & M permit authorization. In this era of rising sea levels, it would be prudent to reassess the impacts of actions along the edges of the Bay much more frequently than has previously occurred.

DEA p. 2-20 – "Over time, Cargill intends to make all outboard and most inboard berms drivable."

We applaud the movement towards the use of land-based equipment instead of dredging through tidal sloughs and cutting through tidal wetlands to access dredge locks. We commend Cargill for proposing O & M activities that can be conducted from land or from the interior of the salt ponds. However, we are concerned that the DEA has not adequately assessed the impacts of converting "all outboard and most inboard berms drivable." Does BCDC intend to cover these activities under the Sal Pond Operations and Maintenance Permit? If these activities are intended to be covered under the proposed Salt Pond O & M permit, and if making berms "drivable" includes increasing the width of existing berms - hence increasing the footprint of the berms

within the salt ponds, or bridging gaps, or culverting gaps in interior berms - then these are regulated activities that could have significant impacts to wildlife that should be identified, analyzed and mitigated in the DEA.

The gaps in internal berms have been documented to provide nesting and roosting birds protection from land-based predators. The September 2016 assessment of best management practices conducted by WRA, Inc.[1] noted, "The company also continues to create 25-foot gaps in a number of levees to improve water flow. The dual-purpose gaps also create new islands for birds that are isolated from predators." [emphasis added]

Siegel and Bacchand[2] noted, "***Lowering the Interior Levee between Ponds 1 and 2*** **-** Lowering this internal levee is optional but desirable and is included in both alternatives. The lowered levee creates upland ecotone as refuge for tidal marsh species and the new gaps reduce predator access." [emphasis added]

And the "Draft Environmental Impact Statement/Report, Phase 2, Eden Landing Ecological Reserve" similarly noted, "*Predation.* Levee breaches may serve to isolate habitat from upland predators. Connecting levees through bridges and trails for public access may limit this value." [emphasis added]

In addition, conversion of these interior berms to "drivable" berms could result in the loss of nesting and roosting habitat for listed and sensitive species due to increases in human disturbance and vehicular traffic. Has Cargill identified which internal berm gaps might be retained? Has there been any coordination with the U.S. Fish and Wildlife Service (USFWS) to determine if there are berm gaps that should not be bridged or culverted to protect listed or rare nesting/roosting birds?

Potential increased vulnerability to land-based predators and the potential loss of nesting habitat resulting from making all outboard and most inboard berms drivable were not identified or analyzed within the EA nor was mitigation for these impacts proposed. This should be rectified before the DEA is finalized.

DEA p. 2-20 – Minor fill and excavation – The project description describes "minor fill and excavation" activities as:

- "Minor excavation to provide access to repair and replace facilities
- Other minor fill or excavation in the Bay, in managed wetlands and in salt ponds for purposes consistent with berm maintenance, access to salt ponds, use of locks, salt making, the placement of pipes, siphons, power, tidal control structures, and the prevention of erosion and repairs related to storm damage"

Are there any limitations on the total acreage or cubic yards of "minor fill" or "minor excavation"

activities that will be permitted per year? The required annual reports of completed work should cover a long enough time span to provide reasonable yearly estimates of minor fill and excavation required for O & M activities, and therefore sufficient information to provide limitations on the amount of minor fill and excavation that can occur per year.

[1] WRA, Inc. 2016. *Working in a Wildlife Environment - An Assessment of the Effectiveness of Cargill Salt's Best Management Practices 2010 - 2015*. August.

[2] Siegel, S.W. and P.A.M. Bachand. 2002. Feasibility Analysis of South Bay Salt Pond Restoration, San Francisco Estuary, California. Wetlands and Water Resources, San Rafael, California. 228 pp.

Please clarify and provide examples of "minor fill" activities covered under "salt making." All of the other examples provided in the statement above are associated with defined activities. "Salt making" is so broad a term that it would encompass all the examples included in the description above. What other activities would be covered under the heading "salt making" that would require "minor fills?"

Figure 2-3 Salt Pond Berm: Typical Cross Section –

On the inboard side of the levee, looking at the area between the "existing berm 2:1" and the inboard toe of the "maintained berm 3:1" that occurs below the pond surface elevation, is this new fill within the salt ponds? Or is the "maintained berm 3:1" what Cargill is claiming to be the baseline width of the levee?

DEA p. 2-30 – Riprap – The description of quantities of material and riprap notes:

> "Nonetheless, it may be possible that additional work not shown in the Work Plan would be required in specific areas. If this additional work exceeds the area delineated in the Work Plan by 10,000 square feet or more, then a revised Work Plan would be submitted to the pertinent regulatory agencies, and any necessary regulatory approvals would be obtained prior to commencing the work as required by the applicable permits."

Does the scenario above refer to the total amount of riprap required over the entirety of the Salt Pond O & M area? Or is the potential exceedance for a specific location? If the latter, then this threshold seems very high for riprap on outboard sides of the levees. In reviewing Table 2-7 "Summary of Volume and Area of Work Conducted, 2008-2019," none of the riprap repairs exceeded 500 lf. 10,000 square feet of riprap, if assuming a width of 20 lf, would be equal to the largest linear footage of outboard levee riprap repair. Inboard riprap repairs were much longer in length than outboard repairs. If the 10,000 sq ft exceedance threshold refers to individual riprap repair locations, then that number should be much lower for outboard levee riprap repairs, perhaps by at least half the number proposed.

Under the discussion of measures to control "non-native animals and inappropriate populations of native animals that threaten species covered in this recovery plan," the Tidal Marsh Ecosystem Recovery Plan[3] notes:

> "...Threats from other mammalian (e.g., Norway rats, cats, skunks, and raccoons) and invertebrate predators (e.g., non-native thistle weevils that feed upon seeds of *Cirsium hydrophilum* var. *hydrophilum*) should be monitored and, if necessary, control measures taken. Control measures may include a number of actions including removal of non-native predators, removal of predator perches, minimization of riprap slope protection, removal of trash from marsh access points, etc." [emphasis added]

[3] U.S. Fish and Wildlife Service. 2013. *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California*. Sacramento, California. xviii + 605 pp. https://www.fws.gov/sfbaydelta/EndangeredSpecies/RecoveryPlanning/Tidal_Marsh/index.htm

Takekawa et al[4] note that "sanitary landfills and riprap shorelines are also sources of predators" of tidal marsh vertebrates. Riprap is known to attract nuisance species. Claffey et. al[5] reported a "widespread infestation of oceanfront riprap by roof rats (*Rattus rattus*) during the summer months of 1979 in Ventura County. And Breaux (2000)[6] laid out the adverse impacts of rats on listed species:

> "A 1992 report on the status of wildlife in the San Francisco Bay stated that there existed a " critical need" for research on the population dynamics and distributions of introduced mammalian predators such as the red fox, the Norway rat, and the roof rat (USFWS 1992). The report stated that techniques such as the reintroduction of the coyote to control the red fox in the South Bay, should be investigated. Control of rats has not been implemented and continues to be a problem in the South Bay for endangered species, such as clapper rails and, quite possibly, salt marsh harvest mice (*Reithrodontomys raviventris*). Additional threats to other target species selected by this project as representative of wetland species in the San Francisco Bay region (e.g., California voles (*Microtus californicus*), ornate shrews *(Sorex ornatus californicus*), salt marsh wandering shrews *(Sorex vagrans haliocoetes*), and amphibians, reptiles, terrestrial invertebrates in general, and some ground nesting birds) probably occur.
>
> Studies of South Bay marshes have documented predation of not only clapper rail eggs, but also of live chicks. While the primary predators may be raccoons (*Procyon lotor*), red foxes (*Vulpes regalis*), feral dogs, or feral cats, rats have been seen in the South Bay in relatively large numbers (Foerster et al. 1990; Albertson, pers. comm.; Harding, pers. comm.). Harvey (1988), in a study of clapper rails in three south San Francisco Bay marshes, attributed 24 percent of nest failures to Norway rats. A 1992 U.S. Fish and Wildlife study of hatching success and predation for 54 active clapper rail nests in south San Francisco Bay found rodents to be responsible for 90% of the eggs destroyed and 79% of the predation at monitored nests. Rodents were thought to be the predators because of the characteristic debris left behind after feeding, in this case egg shells, egg contents, and chick body parts. Other characteristics peculiar to rodent predators is the manner of leaving half of the egg shell intact with visible tooth marks, or a U-shaped notch eaten into the side of the shell (USFWS 1992 and 1997)."

It is evident that riprap provides habitat for non-native predators including rats and that rats have been documented to have adverse impacts to listed and rare species. The use of riprap should be severely restricted, voids should be filled to remove potential habitat for nuisance species and predators, the prohibition of the use of riprap adjacent to tidal marsh habitat or sensitive species habitat must continue, and monitoring of existing riprap for nuisance species should be required. If nuisance/predatory species are detected, consultation with the USFWS and California Department of Fish and Wildlife (CDFW) should be required and appropriate means of eradication identified and approved by these agencies. In addition, we encourage Cargill to explore the use of nature-based solutions where possible to provide alternative means of

[4] Takekawa, John Y., Isa Woo, H. I. L. D. I. E. Spautz, N. A. D. A. V. Nur, J. LETITIA Grenier, Karl Malamud-Roam, J. CULLY Nordby, ANDREW N. Cohen, Frances Malamud-Roam, and S. E. W. La Cruz. "Environmental threats to tidal-marsh vertebrates of the San Francisco Bay estuary." *Studies in Avian Biology* 32 (2006): 176.

[5] Claffey, Daniel P., Madon, Minoo B., Smith, Randall T. *An Integrated Pest Management Approach to Roof Rat Control in Oceanfront Riprap, Ventura County, California.* 1986. *Proceedings of the Twelfth Vertebrate Pest Conference (1986).* Paper 12

[6] Breaux, Andrée. Non-Native Predators: Norway Rat and Roof Rat *Rattus norvegicus* and *Rattus*. Goals Project. 2000. Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish and wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P.R. Olofson, editor. San Francisco Bay Regional Water Quality Control Board, Oakland, Calif.

berm protection to reduce potential significant adverse impacts to native wildlife including rare and listed species.

DEA p. 2-37 – 2.10.1.5 Weed Management – The DEA states:

> "Field inspections and vegetation signatures visible in aerial imagery suggested that among the species colonizing temporarily disturbed areas, invasive species such as perennial pepperweed (Lepidium latifolia) were absent and/or not problematic. Invasive species control BMPs were generally unnecessary at locks (WRA 2016)."

It is clear from reading through the WRA document that at least three dredge locks were studied, but not clear whether all dredge locks utilized during the period of 2010-2015 were inspected and assessed, or whether the condition of dredge locks utilized prior to that time were analyzed.

The 2016 WRA analysis of BMPs included figures that provide an analysis of the current condition of two dredge locks: "Figure 2. Estimated areas of proposed work for access of Lock 2 within Cargill's Solar Salt System" and "Figure 3. Estimated areas of proposed work for access of Lock 26 within Cargill's Solar Salt System."

Figures similar to these should be provided at the time of permit authorization, for all dredge locks that may be utilized during the life of the proposed BCDC permit. Comparisons could then be made between the initial figures and those provided for several years after dredge lock use. These comparisons could then help assess whether the areas impacted by dredge lock access are adequately restoring to desired vegetation targets after the dredge lock has been used. As an example, Figure 3 would seem to indicate this is not entirely the case. While the analysis included in the figure does not indicate the presence of any of the four aggressive non-native invasive species targeted by the Weed Management Program, the figure does indicate that 2,121 sq ft of the total area of disturbance (4,499 sq ft), nearly one half of the area disturbed consisted of "weedy upland grasses and alkali heath" at the time the dredge lock analysis was performed. Photo documentation of areas of disturbance should be provided in annual monitoring reports to the resource and regulatory agencies and in addition to reviewing for the presence of non-native invasive species, the disturbance area should be monitored to determine whether the areas of disturbance remain constant or increase in size (i.e. whether the impacted area remains constant or whether the footprint increases with each episode) and whether or not these areas revert to habitats that can support listed and rare species.

Puccinella maritima (seaside alkaligrass) should be added to the list of non-native invasive species that should be monitored and if documented, removed.

The Weed Management Program should include a BMP that requires survey of areas to be impacted prior to initiation of work and removal of any detected non-native weedy species in advance of the proposed work to avoid spread of non-native invasive species.

DEA p. 2-37 to 2-38 – 2.10.2 Lock Access/Egress – Annual reports of proposed and completed work should indicate whether amphibious excavators have been utilized to "walk" over lock berms, points of entry into the

ponds should be noted for the resource and regulatory agencies and before and after photos provided of areas where the amphibious excavators have "walked" over lock berms in monitoring reports to document that the impacts are indeed temporary in nature and do not require the implementation of remedial measures.

#7 - The DEA states that "Re-useable sheet piles may be placed on the outboard side of a lock to expedite consolidation of material used to seal the access cut, which in turn expedites revegetation in the vicinity of the cut," but does not indicate how long these sheet piles may remain in place, only that the "The sheets would remain in place until they are needed at another site to help seal another lock." How long are these sheet piles typically left in place? Do they have any adverse impacts to adjacent habitats? Do they result in localized erosion of adjacent wetlands or tidal flats along the tidal sloughs?

#9 – Are compliance inspections ever performed by the regulatory and resource agencies to determine that "pre-existing marsh elevations are restored?"

DEA p. 2-41 – 2.10.3 Materials Stockpiles – How often, if ever, are areas that are not identified as existing stockpile areas utilized on the outboard sides of the salt pond levees or within the interior of the salt ponds? Is it a requirement that these areas be identified prior to their use in the Advanced Notification of Proposed Work reports for regulatory and resource agencies review and comment? If new stockpile areas are utilized (excluding those placed on dry land and not in wetlands and pond interiors) how large a footprint do each of these newly utilized areas cover? It should be required that these areas of disturbance are monitored to provide assurance that they become revegetated with target native wetland species and do not become a foothold for non-native invasive species such as *Lepidium latifolium, Dittrichia, etc.*

DEA p. 2-41 – 2.10.3.2 Soil – The DEA states "Imported soil (i.e., soil not originating within areas owned or controlled by Cargill) must be reviewed and approved in advance by the Environmental Manager designated by Cargill." Are the imported soil reports regularly reviewed by the regulatory agencies?

DEA p. 2-42 – 2.10.4 Sediment Removal from Intake Structures – We commend Cargill for proposing a method of sediment removal from intake structure that has the potential to provide much more localized impacts by using divers to suction accumulated sediment rather than using dredges, barges and cranes. BCDC Permit No. 4-93 – Special Condition G required:

> "G. **Mercury Testing.** During the course of the first five years of the ten-year authorization, but no later than February 16, 2000, the permittee shall conduct a one-time mercury testing program, after approval by the United States Fish and Wildlife Service and Regional Water Quality Control Board, consisting of the following: (1) a comparison of levels of bioavailable mercury in selected salt pond levees and adjacent tidal marsh habitats; and (2) sampling of the prey of California clapper rails before, during and after a selected dredge lock access event. The results of these tests shall be submitted to the Commission. Depending upon the results, the Executive Director may impose further testing measures which the permittee, at its expense, shall fulfill or he shall provide a letter indicating that the testing satisfactorily indicates that the amount and/or type of mercury does not pose a threat to species of concern. If the tests indicate levels of concern, further management measures, as agreed up by the permittee and the Executive Director, shall be implemented."

Was this testing completed as required by Permit No. 4-93? If so, were any areas identified that might pose concerns for the work under review in this DEA? Have areas where sediment removal may occur been previously tested for environmental contaminants?

The annual reports of proposed and completed work should indicate the amounts of sediment removed, and whether the sediment has been reused or disposed of.

What is meant by "intake channels?" Does this refer to tidal sloughs? Intake channels do not appear to be indicated on figures that have been provided of the Cargill Solar Salt System. The 2016 WRA BMP analysis states:

> "Similarly, aerial photos were used to verify the work area during dredging of the Coyote pump station intake channel. Aerial photos showed that the intake channel to the main intake pump on Alameda Creek was dredged in early 2014, and all dredging occurred within the existing, unvegetated channel. The marsh habitat on either side of the channel appears untouched by dredging activities. Although there are no specific BMPs that prescribe impact avoidance measures for rip rap installation or pump intake maintenance, WRA was able to verify that Cargill follows the BMP principles while conducting additional maintenance activities to avoid and minimize impacts to sensitive biological resources."

This text would suggest that marsh habitat is not impacted by the proposed activity, however, the DEA states, "Intake channels also require maintenance. Maintenance of intake channels may include vegetation and debris removal as well as sediment removal. Vegetation and debris removal may require use of heavy equipment on mats." The DEA also indicates that "there has been no need for sediment removal during the baseline period" therefore this is considered "new work." Before finalizing the DEA, please provide information on where the "intake channels" are located and provide some estimate of the amounts of vegetation and types of vegetation that may be removed. The impacts of the proposed activity on rare and listed species and to adjacent tidal marsh habitat and tidal flats should be analyzed and if necessary, additional BMPs and/or mitigation should be required.

DEA p. 2-52 to 2-53 – Berm Maintenance – 3 Spills – The 2016 WRA BMP analysis indicated that spillage onto the marsh plain rarely, if ever occurs and in those instances where it has occurred, the material has been removed by hand. If spillage does occur and the material cannot be removed by hand, then it should be required that the regulatory and resource agencies will be contacted, the appropriate course of action should be determined by these agencies, and monitoring of the situation should be required until the issue is determined to be resolved by the agencies.

DEA p. 2-53 "Berm Maintenance-10: Vehicular Traffic" – We believe there may be a typo on this particular item. The Best Management Practice (BMP) states, "**Vehicles** driving on berms, depending on the area and conditions, shall not exceed 35mph." Surely this is an error and the intent was to instead state, "not to exceed 15 mph"? Traveling at speeds greater than 15 mph on levee roads is certainly unsafe, has the potential to generate significant fugitive road dust [7],[8] and could result in injuries to wildlife utilizing the berms for roosting

[7] "*Fugitive Road Dust in the Eastern Coachella Valley.*" South Coast Air Quality Management District. https://www.aqmd.gov/docs/default-source/ab-617-ab-134/steering-committees/eastern-coachella-valley/fugitive-road-dust.pdf?sfvrsn=8

[8] Demer, Lisa. 2017. "*Over 15 mph, we make clouds': Road dust plagues rural Alaska.*" https://www.rcinet.ca/eye-on-the-arctic/2017/08/14/dust-busting-bush-alaska-clouds-with-choking-dust-and-residents-want-to-do-something-about-it/

or nesting. In addition, speeds of 35 mph would pose significant hazards in those areas where pedestrian traffic is permitted.

DEA p. 2-55 – Lock Access/Egress – 10. Sediment within the Access Cut. The DEA states:

> "If additional sediment is needed to achieve the optimal elevations for reestablishing vegetation within the access cut, sediment will be removed from the slough channel and placed in the access cut once the barge has exited."

How often does removal of sediment from the slough channel occur and what amounts of material are excavated? Is it required that this activity is reported in the annual report of completed work along with identification of the location where the removal occurred and the amounts of material removed? What are the impacts of this type of activity and is the area impacted monitored to ensure there are no adverse impacts to adjacent tidal marsh or tidal flats? This information should be provided in the DEA. The conversion to amphibious excavators should hopefully eliminate this practice.

The 2016 WRA analysis of BMPs mentions, "Excavate a "sump" in the adjoining slough to accommodate excavated access cut muds. The excavated material for the sump will be placed atop an adjacent levee." Is this an accurate description of an impact that may occur as a dredge lock is being accessed? If it is, this potential impact should be included in the DEA and analyzed. If Cargill plans to revert completely to the use of an amphibious excavator, or to introduce the equipment into the ponds from land, then this particular action (excavation of a slump in the adjoining slough) may no longer be an issue of concern.

DEA p. 3-69 – Impact BIO-1: Substantial Adverse Effect on Candidate, Sensitive, or Special Status Species Less than Significant:

The DEA has determined that the adverse impacts of the proposed project on listed and rare species is less than significant. The DEA describes how implementation of the proposed Best Management Practices will reduce the adverse impacts of construction related disturbance on these species, but fails to consider the potentially significant adverse risk to roosting and nesting birds that may result from bridging or culverting gaps in internal levees to make them drivable.

The analysis of BMPs provided by WRA in 2016, mentions that Cargill "continues to create 25-foot gaps in a number of levees to improve water flow" and that these gaps "create new islands for birds that are isolated from predators." The review of BMPs documented the ongoing practice of creating gaps in internal levees as part of the operations of the salt making process and the value gaps in internal levees provide to roosting and nesting birds.

The DEA cites the U.S. Army Corps of Engineers (USACE) permit, File Number 19009S98, in particular that:

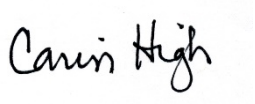
> "...mitigation for ongoing solar salt production has already been provided under the Mitigation in Perpetuity agreement with USACE (File Number 19009S98). Per this document, the 49-acre restoration project is intended to satisfy the compensatory mitigation requirement for activities associated with the ongoing solar salt production in the south San Francisco Bay over the life of this permit, and, if the nature of the work remains the same, beyond to subsequent permits as well (Appendix A). As described in Section 2.6.2, the mitigation completed by Cargill covered

maintenance impacts associated with maintenance activities over approximately 30,000 acres. [emphasis added]

The question is whether the "nature of the work remains the same" i.e., whether the adverse impacts of the proposed work remain essentially the same. The DEA has failed to identify and assess whether conversion of "most of the internal berms" through construction of bridges or culverts to drivable berms would have potentially significant adverse impacts to rare and listed species of roosting and nesting birds through exposure to increased predation and loss of habitat. Therefore, it is unknown whether the previously accepted mitigation is adequate.

Based upon our review of the DEA and the 2016 WRA analysis of BMPs, it is evident that not all impacts of the proposed Salt Pond O & M activities have been fully analyzed nor the impacts to biological resources sufficiently identified. We have also suggested additional BMPs that should be required. We thank you for the opportunity to provide comments and ask that we be kept informed of future opportunities to review and provide comments on this project.

Respectfully submitted,



Carin High
CCCR Co-Chair

Attachment 2

November 12, 2022

Rod K. Iwashita, P.E., F.ASCE, Chair
Engineering Criteria Review Board
San Francisco Bay Conservation and Development Commission
375 Beale St., Suite 510
San Francisco, CA 94105

RE: November 16, 2022 Engineering Criteria Review Board Meeting, Agenda Item #4

Dear Mr. Chairman and Board Members:

We appreciate the diligence of BCDC staff in seeking additional information from Cargill about its facilities and the ability to operate them safely, without risk to San Francisco Bay. After significant questions were raised last year regarding the draft Environmental Assessment for Cargill's Solar Sea Salt System Maintenance and Operation Activities, staff has diligently sought answers to pressing questions in order to establish appropriate permit guidelines and conditions. We appreciate the Board's attention to examine information collected to date and provide the staff with your additional input on the sufficiency of that information for crafting a permit. Our review of the staff report and supporting materials reveals significant additional questions we recommend the Board ask Cargill representatives and BCDC staff.

We remain deeply concerned that the extended storage of high volumes of bittern, which Cargill calls mixed sea salts (MSS) in ponds 12 and 13 immediately adjacent to the Bay, increases the stakes for effective maintenance of those pond berms, especially in a time of rising sea levels and increasing storm intensity and frequency. While Cargill has proposed a pipeline project with the East Bay Dischargers Authority to remove, dilute and discharge stored MSS over time, that project has not yet been approved, and the timing of its permitting, construction and operation are uncertain. Meanwhile, Cargill's annual salt production continues to add more bittern to the 6 million ton stockpile already in those ponds.

To provide additional relevant information for BCDC staff, other regulatory agencies and the public to assess past, current and future adequacy and integrity of the berms, the Engineering Criteria Review Board should ask for answers to questions on several topics. We appreciate you pursuing this information:

A) Seepage and Releases

The staff report represents seepage through berms as "highly limited," [staff report p.8] also that there is no evidence of "prolonged seepage" of brine or MSS [staff report p.9]. Cargill also states there is no "significant evidence" of seepage [ECRB Presentation Package p. 39]. These statements indicate that Cargill has been monitoring for seepage, and that there has in fact been some seepage that the staff memo does not quantify or date. The report does not define the terms "highly limited," "prolonged seepage," or "significant evidence".

- Has any brine of MSS exited from these ponds in the last 20 years via seepage, overtopping, leaks or in other ways, when and how much?
- Did Cargill report those releases to BCDC, the San Francisco Bay Regional Water Quality Control Board (RWQCB) or the U.S. Fish and Wildlife Service (USFWS)?
- How has Cargill monitored for seepage or other releases to reach the above conclusions? How did Cargill document that monitoring?
- Has BCDC obtained that documentation of seepage or other releases from Cargill and if not, why not?

B) Direct Inspections

- Has any staff from BCDC, RWQCB or USFWS inspected berms in these ponds in person, instead of relying solely on statements submitted by Cargill? If not, why not?

C) Ponds 12 & 13 Berm Core Compaction

The staff report contains the revelation that

> "Cargill completed approximately four miles of berm core compaction, primarily prioritized around P-12 and P2-13 (see Figure 3-2a through Figure 3-2d of the Package). This berm core compaction involved extracting the existing berm soils and refilling and compacting the trench with imported materials." [staff report p. 10]

Yet Cargill states that "no wide-scale repairs or berm reconstruction work has proven necessary due to seismic or erosive events." [Cargill ECRB Presentation Package, p. 39]

- What led Cargill to determine this significant berm core compaction work was needed? Did Cargill observe seepage or other berm integrity issues that prompted the company to conduct core samplings or other investigations? Has Cargill provided that information to BCDC and if not, why not?
- Why did Cargill determine that extracting the existing berm soils and replacing them with new material was necessary, after asserting that its bay mud berms are impermeable to seepage from ponds? [Cargill ECRB Presentation Package p. 36]
- What imported materials were used to refill and compact berm this trench? Were these imported materials tested for permeability before placement, and for compaction after placement? Has Cargill provided that materials testing data to BCDC and if not, why not?
- Were imported materials tested for chemical composition in advance of placement to ensure protection of the Bay from toxic contamination, and was this material certified by the RWQCB in advance of placement? If not, why not?
- Were imported materials screened according to Cargill's own specifications for acceptable riprap and clean material to ensure they are "free of debris, trash and other foreign material" [Draft Environmental Assessment, April 2021, Appendix 3]
- Was any of this extraction and refilling activity approved and permitted by BCDC or the RWQCB, and if not why not? Was this activity reported to these agencies in full through annual maintenance reports or other means before the current permit revision process was initiated?

D) Mixed Sea Salt Storage Volumes

Accurate assessment of berm safety and containment capability should be based on future MSS volumes stored in pond 12 and 13, and increasing potential for significant rainfall into the ponds from extreme storms added to MSS, not just current levels of MSS during extended drought conditions.

- What is the rate at which additional MSS is being added annually to the existing stockpile in ponds 12 and 13?
- How could these additions affect the integrity of the berms and the risk of seepage, spilling, or overtopping in combination with other factors, until the proposed pipeline to remove stockpiled MSS is approved, constructed and begins operating – which would be at least two years from now or longer depending on approval, permitting and construction delays [Cargill ECRB presentation package, p. 27]?
- If the pipeline does begin operation and removes MSS at the maximum rate proposed, and new material is being added to the stockpile at the same annual rate, what will be the net change in material volume each year?
- Has Cargill or BCDC modeled the impact of significant precipitation adding to combined MSS and water levels in ponds 12 and 13? What would be the impact of this added hydraulic pressure on seepage, risk of overtopping and berm integrity during all normal and extreme tide conditions?

E) Water Level Variation – Differential and Overtopping

Cargill's earthen berm maintenance and sea level rise assessment includes a figure presenting a "typical berm cross-section" [ECRB Presentation Package, figure 3-1] but does not detail how much variability in berm height and width, and internal and external berm water levels are present in ponds 12 and 13, and the potential for more significant differential water head to increase berm seepage.

Cargill also states "Although Bay water levels fluctuate tidally, on average there is typically less than a foot of difference between average water levels inside the ponds compared to average water elevations in the tidally influenced Bay." [Cargill ECRB Presentation Package, p. 39]. Reliance on "average" water levels does not address the risks to berm integrity, overtopping or other releases from ponds to the Bay by the much more significant differences between water levels inside the ponds and in the Bay from daily tidal fluctuations, seasonal variation, extreme storm precipitation and wind conditions, and the combination of these factors.

In addition, Cargill's sea level rise assessment notes, "overtopping only considers astronomical tide and storm tide and does not account for wave overtopping, which may occur along bayfront segments of the berms prior to still water overtopping." [AECOM Final Sea Level Rise Assessment, p. 13] The Assessment notes additional caveats regarding its inundation maps [AECOM p. 18]:

- maps "represent stillwater elevations and do not account for storm waves, rainfall or other potential variations in conditions that could affect the depth of overtopping at any given location…. Increases in storminess were not considered in this analysis. Various physical processes are typically grouped together under the term "storminess" including frequency and intensity of storms, shift in storm tracks, magnitude of storm surges, and wave heights."
- Maps "do not account for localized flooding associated with rainfall events or any changes to rainfall patterns, frequency, or intensity. During heavy rain events, berms along stormwater channels have experience occasional overtopping and scour in he past."
- "The maps do not account for potential berm failures or breaching that may occur due to scouring of berm walls during flood events or chronic inundation due to sea level rise."

- How much does the difference between internal and external berm water levels vary daily and seasonally in ponds 12 and 13? What combination of conditions creates the greatest difference in these levels, and what is the risk to berm integrity and exchange of water between ponds and the Bay under those conditions?
- Do Cargill operations dictate specified differential water head, and do they dictate a specific amount of combined mixed sea salts, brine and rainwater that can be safely stored in ponds 12 and 13?
- Has BCDC considered mandating restrictions on differential water head in Cargill's permit to ensure margin of safety against seepage or other release to the Bay?

F) Other Ponds

Several other ponds in addition to ponds 12 and 13 contain hypersaline materials.

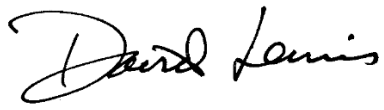
- How will BCDC evaluate and verify the integrity of these other berms and risk of seepage or failure there?

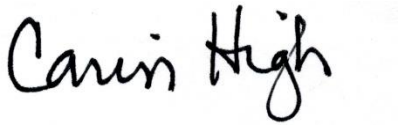
G. Vinyl Sheet Pile

The draft Environmental Assessment for this permit revision references a pilot study proposed by Cargill to install vinyl sheet pile in its earthen berms to improve their structural integrity.

- Has BCDC evaluated the feasibility, benefits and impacts of such installation?
- Has the RWQCB determined that placement of vinyl sheet pile in these berms is consistent with water quality protection guidelines?

Thank you again for your attention to these important issues. Sincerely,





David Lewis, Executive Director
Save The Bay
300 Frank Ogawa Plaza, Suite #10
Oakland, CA 94612
510-604-7723

Carin High, Co-chair
Citizens Committee to Complete the Refuge
453 Tennessee Lane
Palo Alto, CA 94306
510-378-2120

About Save The Bay

Save The Bay is the largest organization working to protect and restore San Francisco Bay for people and wildlife, with 60 years of accomplishments and tens of thousands of supporters. We led the movement to halt unlimited filling of the Bay in the 1960s, and sponsored the legislation to establish BCDC with the mandate to minimize fill and maximize public access to the Bay. We advocate to reduce pollution, expand wetlands and accelerate region-wide adaptation to sea level rise and other climate impacts. We annually engage more than 5,000 volunteers to restore the Bay shoreline, and educate thousands of students about the Bay.

About the Citizens Committee to Complete the Refuge

The Citizens Committee to Complete the Refuge (CCCR), has an ongoing history of interest in wetlands protection, wetlands restoration and wetlands acquisition. Our senior members were part of a group of citizens who joined together, and with the support of Congressman Don Edwards, requested that Congress establish the Nation's first national wildlife refuge in an urban setting. In 1972 legislation was passed to form the San Francisco Bay National Wildlife Refuge ("Refuge"). We turned to Mr. Edwards again, and in 1988, his legislation to double the size of the Refuge was signed into law. CCCR has taken an active interest in the protection of tidal wetlands and the habitats and species supported by complete tidal wetlands habitats, and in the McAteer-Petris Act and BCDC's Bay Plan. As such we regularly comment on permit applications, policies and potential permit non-compliance.

Attachment 3

Gmail

Carin High <cccrrefuge@gmail.com>

RE: Fwd: Additional information regarding riprap

1 message

Olsson, Schuyler@BCDC <schuyler.olsson@bcdc.ca.gov> Wed, Jun 9, 2021 at 1:48 PM
To: CCCR <cccrrefuge@gmail.com>

Hi Carin,

Thanks for letting me know. We will be sure to review this and share it with the applicant as well.

Best,

Schuyler Olsson

Coastal Program Analyst

San Francisco Bay Conservation and Development Commission

+1 (415) 352 3668

schuyler.olsson@bcdc.ca.gov

From: CCCR <cccrrefuge@gmail.com>
Sent: Wednesday, June 9, 2021 13:19
To: Olsson, Schuyler@BCDC <schuyler.olsson@bcdc.ca.gov>
Subject: Fwd: Fwd: Additional information regarding riprap

Dear Mr. Olsson,

I hope you are well. This didn't make it into the CCCR comment letter regarding the Salt Pond O & M permit, but perhaps this information might be of use during consideration of the permit conditions or for other permit applications proposing the use of riprap.

I had a discussion with Dr. Peter Baye regarding how to mitigate the potential adverse impacts of riprap on special status and listed species due to the attractiveness of riprap to nuisance/predator species.

Respectfully,

Carin High

CCCR

Sure. It's setting-dependent, though. Here's an abbreviated spectrum from minor mitigation (infill riprap cavities with gravel to squeeze out interstitial rat habitat space) to environmentally superior alternatives, depending on shoreline setting.

For very high-energy exposed open bay levee shores (direct wave attack from open bay flats, no fringing marsh), the existing riprap (previously placed unengineered concrete slab or rubble from 1940s-1980s, and engineered quarried rock riprap from 1990s onward) can be mitigated minimally by "saturating" the interstitial spaces with medium poorly sorted gravel (pea gravel-3/4" drain rock mix). That plugs up the rodent cavity habitat, and may trap enough finer sediment to allow some (sparse) salt marsh vegetation to roughen the rip-rap and increase wave attenuation. It would also be a good idea to mix in some bay mud in with the poorly sorted gravels to maximize potential for vegetation, similar to the way gabion plantings work. Since no trees or large shrubs can grow at the saline bay edge, the stability issues for vegetation in armored banks don't apply here.

One step up from minimal mitigation would be to over-saturate riprap (old or new) with gravel, so that the gravel volume in excess of interstitial space capacity would be reworked (selectively transported onshore and alongshore by higher waves) and deposited as high gravel berms, with crests above High Tide Line (wave uprush elevation above still-water highest tides). The gravel berms (beach ridges) provide additional erosion protection (wave energy dissipation is significant), and also extensive high tide roosts for small shorebirds (like western and least sandpipers, which use the existing gravel bayshore barrier beaches that self-constructed from erosion of old gravelly fill at historic landings; *see attached 2014 memos to John Bourgeois (SBSPRP) and Marilyn Latta (SCC/ISP)*. Potential nesting habitat if extensive and isolated enough. In other words, bury the rip-rap with gravel beaches that enhance their functions and extend their life (eliminating scour under and above the rip-rap, minimizing wave overtopping and gullying of the levee crest/road). The riprap itself acts as a backstop under the gravel beach, and in principle it can be reduced (lower rock fill volume, cost) if the gravel takes the brunt of the wave action. Also, storm wave-deposited gravel beach crests can actually rise higher than the levee road itself, as sea level rises. Not forever, but longer than immobile riprap, which doesn't adjust to SL or wave height.

Next level, alternative to evaluate short of "managed retreat" (conversion to tidal or overwashed intermittently tidal habitat, post-industrial), would be a set-back benched levee and gravel beach/buried riprap design adapted for significantly higher sea level rather than maintenance of existing facilities at current sea level. Not sure this will actually be needed, or whether it will be pre-empted by land use change...but if "mitigation" creeps into long-term performance time-lines or critieria, this should be evaluated for multi-decade use:

- Set-back design: fill/widen road and slope incrementally on interior side to maintain road width and stable slope; excavate flat/gently sloping high vegetated bench on bayward side, to HTL, one road width (about 12-15 ft) zone of dense high salt marsh vegetation. Vegetated bench reduces wave runup and increases wave attenuation. Retained toe riprap/gravel berm stabilizes wave swash zone while mainaining well-distributed high tide roost gravel beach habitat.
- Retain prior placed riprap and gravel berm on original slope below HTL; supplemental maintenance of gravel supply (incremental). May recycle/beneficially reuse poorly sorted gravel bar sediment from flood control channels (ALA). Finer sediments dissipate (silt) or deposit as sandy to gravelly veneer on flats (weak armoring inhibits wave resuspension and erosion of upper flats). Gravel is selectively retained and nourishes beach berms as sea level rises. Gravel beach crest instantaneously adjusts to rising sea level and wave uprush elevation.

Attachment 4

Peter R. Baye, Ph.D.
Botanist, Coastal Plant Ecologist
33660 Annapolis Road
Annapolis, California 95412-0065

baye@earthlink.net

(415) 310-5109

MEMORANDUM

To: John Bourgeois, S Bay Salt Pond Restoration Project
Cc: Jeremy Lowe, ESA
Date: November 11, 2014

SUBJECT: Regeneration of marsh-fringing gravel barrier beach evolution following eradication of hybrid *Spartina*, pond 2A and 4A between Alameda Flood Control Channel and Ideal Marsh (Coyote Hills ponds); high tide shorebird roosts (sandpipers)

John-

This is a follow-up for our conversation about the spontaneous gravel beach expansion on the outer bayside fringing marshes along salt ponds 2A and 4A, west of Coyote Hills. I reported my observations to Marilyn Latta after Donna Ball and I visited them last month. I subsequently checked the time sequence of photos on Google Earth through the eradication period, and it seems that the source of the anomalous gravels (mostly angular metachert with large quartz veins, apparently local Franciscan quarry rock) is the erosion of (former) outer perimeter levee remnants, parallel with the outer edge of Ideal Marsh (a 1930s failed salt pond levee). I'd be happy to tour them with you, especially for consideration of their applicability to Eden salt pond outer levee treatments in alternative designs. In the meantime, here's a photographic field trip summary of what I saw.

While the hybrid *Spartina* colonies were expanding and coalescing, the beaches were partly smothered by fine sediment and *Spartina*, and their erosional source of coarse sediment was intercepted by the Spartina marsh. Spartina colonies also restricted swash action on the beachfaces. Local eradication seems to have remobilized the coarse sediment from remnants of the old outer levee and previous *Spartina*-stabilized beaches, resulting in expansion of a series of NW-facing pocket barrier beaches deposited on top of high salt marsh platforms and scarps. Each pocket beach's west end was tied to marsh "headlands" with relatively erosion-resistant rocky lag surfaces (levee remnants). At high tide (high marsh surface submerged at time of observation), each of the pocket barriers had small flocks (about 10-15) of least and/or western sandpipers.

The individual pocket beaches appear to be composite features, with different parts formed under different wave conditions: flatter, wider, poorly sorted washover fan sediments (gravel and sand, anthropogenic debris – high wave energy and high tides), and younger, steeper, higher berms with lighter woody and fibrous (grassy marsh litter) organic debris. The higher berm crests are almost 0.8 m above the adjacent pickleweed high marsh plain. Some of the beachface gravels are very large (10 cm or more), and may effectively be lag armor surfaces except under extreme storm wave energy conditions. There are also old boulders along the outer edge of the marsh, probably remnants of old repairs before levee failure. (noteworthy because they could be redistributed to anchor "headlands" of new NW-facing pocket beaches).

The contrast between the wave-sheltering effects of the marsh and beaches, and wave-exposed outer salt pond levee fronted by mudflat, is dramatic. The unbuffered levee segments are all armored with very well-scoured, unvegetated coarse rubble, but the marsh/beach fronted levee is growing high marsh vegetation (pickleweed and alkali-heath) 1-2 feet above the high marsh level.

Some potential applications of this spontaneous gravel beach evolution for salt pond restoration designs:

- The long, straight old levee alignment was broken up into a series of NW-oriented pocket beaches, facing dominant wave direction, due to presence of local marsh "headlands" with relatively greater resistance to erosion, apparently due to very coarse gravel and small cobble embedded in marsh peat or basal levee fill remnants. This creates a set of littoral sub-cells, each with impeded longshore transport. Without the headland groin-like traps, beach-sized sediment is apt to drift alongshore. Analogous headland features were constructed from decay-resistant eucalyptus logs inserted into bay mud at Aramburu Island beach.
- Coarse, angular gravel and very coarse sand seems to be selected in these higher wave energy shorelines with narrower mudflats and deep water fetch to NW. The beach features were self-constructed from reworking of local coarse sediment deposits without engineered placement of sediment. Self-organized littoral cells formed between local headland features and erosional sources of coarse sediment.
- Shorebird (sandpiper) use of the beaches at high tides when all tidal flats and salt marshes are submerged is evident. Amphipods appear to be present in moist gravels.
- Oyster shell hash (native oyster shell deposits) form beach slopes and crest elevations like coarse gravel at Aramburu Island, but shell was more mobile in cross-shore and alongshore transport during storm wave conditions.

Concrete slab/rubble-armored bayfront levee south of fringing salt marsh/barrier complex.

High marsh vegetation establishes on the lower half of the bayfront levee slope, in zone of storm driftwood debris deposition, in the lee of barrier beach/fringing marsh complexes. The driftwood elevation range indicates storm high tide water levels, and the persistence of perennial high salt marsh in this zone indicates that wave energy and erosion is strongly damped by the marsh and beach, relative to adjacent wave-scoured rubble armored levees exposed directly to open tidal flats.

Proximal (bayfront levee) end of marsh-fringing pocket gravel barrier, mantled with storm-deposited marsh litter and driftwood, emergent during marsh-submerging non-storm high tides. Invertebrate (amphipod) production in the moist litter is significant.

Western sandpipers roost and forage (amphipods?) on moist gravels and back of washover fans.

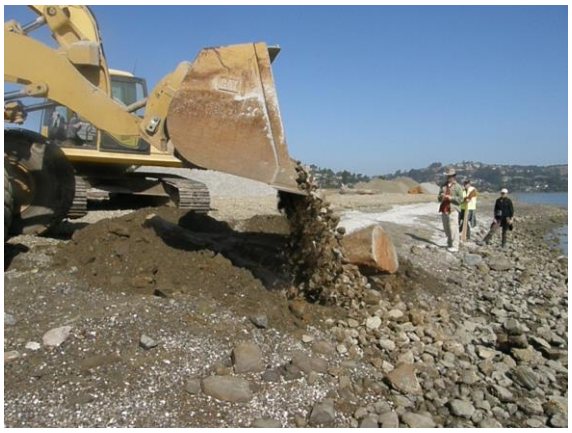
Composite structure of bayward barrier profile: mobile gravel beachface (above coarse gravel-cobble lag, submerged) topped by steep berm (spring tide) of organic detritus, shell, sand, and finer gravel.

Stepped beachface profile – staircase of gravel swash bars from falling tide with swash action. Marsh headland = scour-resistant gravel lag embedded in marsh sediment.

Remnant gravel and shell washover fans (storm wave deposits older than berm crest) at back of barrier beach profile. Note partial impoundment of marsh drainage – ponded fringe.

Angular chert (predominant) gravel of berm top and beachface. Matches local Coyote Hills Franciscan outcrops near quarry. Lack of abrasion-rounded or polished sediment indicates origin other than stream gravel or remobilization old beach deposit; no headland sources for angular colluvium.

Fine organic (marsh litter fragments) sediment mantle the gravel beachface of one pocket barrier during low wave energy conditions. Note washover gravel and shell in lee of steep, narrow litter-berm crest.



Aramburu Island wood micro-groin construction technique: large eucalyptus logs punched into soft bay mud like toothpicks in frosting, inserted about ½ length, and buttressed with cobbles and small boulders up to about 1 ft diameter. These create effective headlands in the upper beach profile, trapping prograded pockets of beach sediment facing toward the dominant wave direction. Beach sediment downdrift of the groin in the adjacent littoral sub-cell is transported alongshore to the next groin. Structure corresponds with gravel-cobble lag in marsh headlands outside pond 2A.