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Overview of Environmental Site Assessments and Investigations

Cargill Salt Property, San Francisco Bay, CA

A primary goal of the U.S. Fish and Wildlife Service (FWS) and the California Department of Fish and Game and Wildlife Conservation Board (State) during the acquisition process has been to determine whether there are any recognized environmental conditions that should be addressed before or as a condition of acquiring the property. The agencies, with the assistance of consultants, employed a multi-step process to obtain data on which to base their decisions.

FWS is required under Department of the Interior regulations to perform (by staff or through contract) environmental site assessments of any property that it acquires under fee title or easement. FWS policy allows FWS to utilize the results of independent site assessments if they fully satisfy Department of the Interior standards. Such an approach is consistent with the common practice of commercial lenders and the commercial real estate market. The State has similar requirements.

Cargill Salt contracted independent consultants Erler & Kalinowski, Inc. (EKI) to perform a Phase I Environmental Site Assessment (ESA) of the properties proposed for acquisition, which the agencies reviewed. FWS and the State used the findings from EKI's Phase I ESA, supplemented with additional inquiry and testing in their own follow-up investigations, as part of their pre-acquisition review of the property.

The environmental site assessments focused on three general categories – plant site, salt pond and off-site issues. Overall, contaminant issues identified in localized areas on or adjacent to the property are not unusual considering the intense urban and industrial land use in the San Francisco Bay area. Most on-site issues have been resolved, including county certified removal of underground storage tanks, debris removal and removal of sandblast wastes. In situations where the identified materials from off-site sources require clean up, they are being remediated by third parties.

This overview provides a short summary of each document, followed by a discussion of the major issues that were raised and how they are being addressed.

Phase I Environmental Site Assessment

The purpose of a Phase I environmental site assessment is to identify the presence or likely presence of any hazardous substances or petroleum products on the property, even when in compliance with environmental laws. A Phase I site assessment looks at both on-site and off-site issues. It typically includes a data search and records review of the property being assessed as well as of adjacent properties, interviews with regulators, interviews with current and former employees who worked in the area and site visits. It does not typically include soil, sediment or groundwater sampling and analysis.

Cargill Salt, as a responsible business practice, requires environmental site assessments for property acquisitions or divestitures. Cargill Salt contracted EKI to perform a Phase I ESA according to national ASTM standards. These standards are a generally accepted business practice and recognized by environmental laws as being the appropriate standard for reviewing property acquisitions and dispositions.

State's Environmental Investigations of the Napa Plant Site and Baumberg Ponds

The State's Site Investigation Report documents sampling and analyses performed during the fall of 2002 at the Napa plant site and the Baumberg salt-concentrating ponds, which the State proposes to acquire from Cargill. The Napa plant site is located on the northern edge of San Pablo Bay adjacent to the Napa River in American Canyon. The Napa plant site consists of salt-concentrating ponds, wash ponds and crystallizers, which make up the majority of the site, and the upland operational areas where harvested salt was washed and stacked, equipment was stored and maintained and where residences and maintenance, storage and office buildings are located. The Baumberg ponds are located on the eastern edge of San Francisco Bay in Alameda County, directly west of Union City and south of Hayward. There are no buildings or operational areas at the Baumberg ponds.

The purpose of the State's site investigation was to follow up on issues raised by EKI's Phase I ESA. The State's contractor, CH2M HILL, collected soil and groundwater samples at various sites and screened the data from the subsequent analyses to determine the presence or absence of contaminants and the magnitude of any contamination.

Most of the sample locations were at the Napa plant site. Sampling locations were selected to represent overall site conditions or targeted locations with evidence of possible contamination, such as soil staining or low points in the surface topography. A total of 109 soil, sediment and groundwater samples were collected and analyzed. All but seven of the sample locations were at the Napa plant site. At most locations, a single shallow soil sample of the first native material beneath the surface (such as compacted road base, asphalt or concrete) was collected. At some locations, two or more soil samples were collected at varying depths to determine whether contaminants have migrated downward in the soil. In addition, discrete groundwater samples were collected from three borings in the debris burial area (described below) at the Napa plant site. Based on the initial analytical results, follow-up sampling was conducted to determine the extent of potential contamination identified in the first round of sampling.

FWS' Environmental Investigations of the Alviso Ponds

EKI's Phase I ESA documented a number of issues that required further attention regarding the West Bay and Alviso ponds, which FWS proposes to acquire from Cargill. Most of the issues have been resolved through coordination with Cargill and collection and review of additional information. However, FWS identified the need for additional investigation of the state of mercury and other metal contamination in the Alviso ponds in the South Bay due primarily to

mining activities in the Guadalupe River watershed. The Alviso ponds are located in an area that stretches from Mountain View to San Jose.

To further investigate the presence of mercury and other metals in these ponds, FWS conducted a Phase II environmental site assessment. This assessment was designed to provide a snapshot of potential contamination in the South Bay pond system for acquisition decision-making purposes. It was not designed as a detailed biological risk assessment of mercury in the ponds. However, the assessment does provide some initial data on the current bioaccumulation potential in the ponds.

Plant Site Findings

Of the 16,500 acres included in the proposed acquisition, industrial maintenance activities were limited to a very small area at the Napa plant site. This is where equipment historically was maintained, stored and repaired.

Plant Site Issue 1 - Soils

Motor oil, hydraulic fluids or other petroleum-based lubricants and rust control treatments historically were used and stored at the Napa plant site. In addition, polychlorinated biphenyls (PCBs) and other contaminants may have been used in the past in electrical transformers. The existing transformers were replaced in 1987, and evaluation of the transformer sites showed no evidence of releases. The State and its consultant reviewed spill response records at the Napa plant site and determined that sampling for PCBs under existing transformers was not warranted.

Plant Site Soils Investigation

- The State's consultant collected and analyzed soil samples in upland areas of the site.
- Total Petroleum Hydrocarbons (TPHs) were detected in numerous shallow soil samples, most notably around the exterior of the locomotive barn and maintenance shop and adjacent to and in the concrete-lined sump in the steam-cleaning area. Analytical results indicate that the detected petroleum hydrocarbon may be lubricating oil or another relative heavy petroleum fraction. The concentrations were found to decrease significantly with depth.
- A single polychlorinated biphenyl (PCB), Aroclor 1254, was detected in shallow soil samples adjacent to the steam-cleaning wash area and the maintenance shop. The State's consultant followed up with additional sampling in the area. The concentrations were lower approximately 10 feet from the edge of the concrete pad and significantly lower in a soil sample collected 2 feet below the location of the maximum detection.

Plant Site Soils Follow-Up Action

- Cargill Salt has agreed to remove materials in the concrete-lined sump and to remove petroleum and PCB-impacted soils from these isolated upland areas of the site.

Plant Site Issue 2 - Lead Paint

Lead paint may have been used previously on buildings on the Napa plant site.

Plant Site Lead Paint Investigation

- The State's consultant collected soil samples around the two residences. Elevated lead concentrations were reported in many of the shallow soil samples. Flakes of paint were observed on the residences and on the ground and are presumed to be the source of the detected lead.

Plant Site Lead Paint Follow-Up Action

- Cargill Salt has agreed to remove lead-impacted soils from around both residences.

Plant Site Issue 3 - Debris Burial Area

A long-time employee reported that several drums with tarry paint wastes may have been buried at the Napa plant site many years ago. In response, Cargill Salt hired NorCal Geophysical Consultants to conduct a magnetometer survey of the site to indicate which areas, if any, warranted further investigation. As a result of the survey, a small portion of the plant site was excavated, uncovering buried metal plant equipment, some trash and five corroded, partially collapsed drums. Cargill Salt found no evidence of petroleum products in the area or residues of any kind in the drums. The materials were removed and the excavation backfilled.

Plant Site Debris Burial Area Investigation

- The State's consultant sampled five locations within the debris burial area. An area of perched groundwater at approximately 5 feet below ground surface (bgs) was identified within the debris burial area that had been excavated by Cargill. A shallow aquifer was also identified at approximately 45 feet bgs. Somewhat elevated levels of petroleum hydrocarbons and metals were reported in a sample from the perched aquifer. Laboratory results suggest that any contamination is limited to the perched groundwater and does not extend beyond the dimensions of the excavation or to the water table. Low levels of acetone and other volatile organic compounds (VOCs) were also detected in samples in this area. The levels were low and isolated and therefore not of concern.

Plant Site Issue 4 - Dredge Spoils

The barge canal that was used to ship salt from the Napa plant site was periodically dredged to maintain an open channel. Dredge sediments have been stockpiled near the barge canal.

Plant Site Dredge Spoils Investigation

- The State's consultant collected and analyzed sediment samples to check for possible contaminants. Nothing of concern was found.

Plant Site Issue 5 - Asbestos

Transite, a solid building material containing low levels of asbestos, was used in the construction of the maintenance and locomotive sheds as well as the office restroom, and one of the two houses on the property contains linoleum backing that contains asbestos.

Plant Site Asbestos Investigation

- The asbestos is non-friable so it does not present a hazard in its current state. Cargill Salt has provided the State with an asbestos-management plan, which addresses maintenance of the structures and other protective measures. The State is not requiring removal of asbestos by Cargill.

Other State Site Investigation Findings

- Somewhat elevated concentrations of metals, TPH and polynuclear aromatic hydrocarbons (PAHs) were detected in a single sample collected at 8 feet bgs in a single location in the southern levee. The contaminants detected in the sample appear to be isolated in extent and directly related to the debris observed in the sample interval. These localized concentrations do not pose a current human health or ecological risk. The State is not requiring Cargill to remediate the sampled area.
- The ponds at the Napa plant site, used principally as crystallizers or for storage of hypersaline brines or wash water, were sampled. Metals concentrations in soil appear representative of background and are thus not a concern.

Salt Pond Findings

The salt evaporation ponds, which make up the vast majority of the property, are more akin to duck ponds or other managed habitats than to a typical industrial use. No chemicals or other foreign material are added to the Bay water or brines (saltwater) in the ponds in the solar salt-making process. Brines are moved from pond to pond primarily by gravity. The permanent pumps on the property are powered by electricity -- not petroleum-based fuels. In addition, the ponds have largely been sheltered from the effects of urbanization in the region because they

have been closed off from the Bay and adjacent property for more than a century. Cargill routinely tests its salt, including food-grade salt, for possible contaminants. The product line has never shown elevated levels of heavy metals or other contaminants.

Salt Pond Issue 1 - Brines and Salt

Although high-salinity brines are not hazardous materials, they could impede marsh restoration if not removed from the property.

Salt Pond Brines and Salt Follow-Up Action

- At FWS and the State's request, Cargill Salt has agreed to transfer high-salinity brines and salt from land that would be acquired in the South Bay to the company's plant site in Newark. Similarly, Cargill Salt has agreed to remove brines, salts and salt-harvesting by-products from the Napa plant site. Removing these materials will assist FWS and the State in their initial stewardship and long-term restoration of the property.

Salt Pond Issue 2 - Lead Shot

Cargill Salt permitted recreational waterfowl hunting on the property for many years, raising questions about potential lead shot impacts.

Salt Pond Lead Shot Investigation

- FWS and the State have reviewed the potential for lead shot contamination due to waterfowl hunting on Cargill Salt ponds. The legal waterfowl hunting allowed on the property – restricted to relatively few people, spread across a large area, and infrequent shooting limited to the hunting season – is similar to hunting activities allowed on many national wildlife refuges as well as on state wildlife management areas across the country. This type of hunting is of significantly lower intensity and density than that which occurs at a gun club skeet range such as the site in Menlo Park (see Off-Site Sources Issue #1 below). Cargill Salt has banned the use of lead shot on its property for nearly 10 years. Research in other parts of the country has shown that the effects of lead shot in hunting areas declines as the use of alternative shot increases. No lead pellets or significant lead residues were detected in the samples collected by the State's consultant at the Baumberg concentrating ponds. FWS' Phase II investigation found that concentrations of lead in ponds are at ambient Bay levels. Lead is not a concern in the pond system and supports FWS' conclusion that past waterfowl hunting with lead shot has not impacted the ponds.

Off-Site Sources Findings

The Phase I ESA also reviewed adjacent land uses and potential off-site sources of hazardous materials.

Off-Site Sources Issue 1 - Pond SF2

The San Francisco Public Utilities Commission is remediating lead contamination from the former Peninsula Sportsman's Club shooting range adjacent to pond SF2 near the west end of the Dumbarton Bridge in Menlo Park. This effort will include removal of lead contamination on the SF2 pond levee and a small area within the pond.

Off-Site Sources Pond SF2 Follow-Up Action

- Cargill Salt is cooperating with the Commission on this action to assure that applicable cleanup standards will be met. Pond SF2 will not be transferred to FWS ownership until the cleanup is completed.

Off-Site Sources Issue 2 - Moffett Field

Two Moffett Field-related contaminant issues were identified. 1) Department of Defense contractors installed monitoring wells on Cargill Salt property to ensure that volatile organic carbons (VOCs), pesticides, PCBs and metals from a closed landfill on Moffett Field property had not migrated off-site via groundwater under Cargill Salt property. The most recent monitoring results indicate that no contaminants have migrated off-site. Cargill Salt and FWS will continue to review monitoring results. 2) As part of its due diligence efforts prior to the proposed sale, Cargill Salt discovered that the property line between Cargill and the Navy runs down a ditch that historically drained stormwater runoff from Moffett Field. PCB, pesticide, and metal contamination recently were discovered in sediment in the ditch, which is separated from Cargill Salt's operations by a roadway. The ditch does not now and has never drained into any salt ponds.

Off-Site Sources Moffett Field Follow-Up Action

- Due to concerns about contaminants in this ditch caused by third parties, the ditch has been excluded from the proposed acquisition.

Off-Site Sources Issue 3 - Mercury

The mercury contamination legacy in California starts in the Coastal Range where cinnabar deposits were mined and processed to produce mercury used in the Sierra Nevada Range for gold and silver mining. Mercury from both mining activities ultimately reaches the San Francisco Bay, resulting in human health advisories for consumption of certain fish species and elevated levels of mercury in aquatic dependent birds. The Alviso pond complex in the South Bay is located at the terminus of the Guadalupe River watershed where the country's largest mercury mine complex was located. These mining operations peaked 130 years ago but continued into the early 1900s. The Guadalupe River turns into Alviso Slough before it reaches the Bay. As a result, ambient mercury levels are higher in Alviso Slough and surrounding areas than they are in other parts of the Bay. Other mercury and metal contamination in the Bay is associated with

loading from Central Valley rivers, urban runoff, industrial discharges, atmospheric deposition, and wastewater treatment plant discharges.

Cargill Salt did not create the mercury contamination in the South Bay. It is unknown how isolation of the salt ponds 50 or more years ago from the Bay proper and the sloughs has impacted the movement of the mercury into the pond system. The primary intake structure for the Alviso system is in pond A1, west of the sloughs carrying the mercury load from the Guadalupe River. However, there are supplemental intakes at pond B1 just west of Guadalupe Slough and pond A9 at the mouth of Alviso Slough. Phase II sampling of sediment and biota from representative ponds was recommended to document mercury levels in the Alviso ponds and compare them to levels found elsewhere in San Francisco Bay. Within the Alviso pond system, FWS proposes to acquire fee title of Ponds A1 - A8 (including B1 and B2) and salt-making or water management rights for ponds that FWS already owns in fee title (A9 - A17).

Investigation of Off-Site Sources Mercury

FWS' Phase II site assessment included the collection of 18 sediment samples and more than 100 biota (snail and fish) samples in the Alviso ponds, as well as other data.

- Mercury in sediment from ponds in the A1 - A8 complex where FWS is acquiring both fee title and water management rights appear to be at concentrations similar to Bay-wide ambient levels, which are lower than ambient mercury levels in the Guadalupe River watershed-influenced South Bay. The only exception is pond B1, where mercury levels are similar to ambient South Bay levels. There is a supplementary intake at B1 that pulls water into the pond from areas that are directly influenced by the Alviso and Guadalupe sloughs.
- Mercury in fish from ponds proposed for fee title acquisition (A1 - A8 complex) are at concentrations similar to those seen in fish elsewhere in the Bay. The types of fish that live in the ponds are forage fish for birds and other fish.
- Mercury in sediment from ponds A9 and A10, for which FWS currently owns fee title but not water management rights, are at elevated levels compared to ambient Bay levels but not necessarily higher than ambient levels found in nearby sloughs, marshes and mudflats.
- Mercury concentrations in fish from ponds A9 and A10 are at levels that may cause problems in wildlife feeding on them. Mercury in eggs of terns feeding and nesting in the area are at levels that could cause reproductive impairment but this has yet to be documented.
- In addition to mercury, FWS investigated the state of other metal contamination in the ponds and concluded that concentrations of other elements in sediments from the salt evaporation ponds are at Bay ambient concentrations or at concentrations that are not of concern.

Off-Site Sources Mercury Follow-Up Recommendations

- A 1996 San Francisco Estuary Institute report on mercury effects, sources and control in the Bay area concluded that: "In the Estuary, mercury contamination is probably far too widespread for direct/physical areal control measures to be effective or economically feasible. However, significant opportunities may exist for effective point source remediation of important mercury discharges, which would otherwise continue to be transported into the Estuary." Point source remediation means addressing the release at its point of origin and could include addressing the former mercury mines in the Guadalupe River watershed.
- Any remediation of mercury in ponds A9 - A17 would be difficult because it would have to occur on an immense scale, would have a significant physical impact on local resources, would have no guarantee of success, and would likely not be cost effective. Past and proposed remedial actions along with flood control projects upstream in the Guadalupe River watershed will reduce the input of new mercury into the South Bay. Options for ponds A9 - A17 therefore, would be limited to management and restoration actions that maintain habitat integrity without increasing methyl mercury production.
- Concentrations of metals, including mercury, in sediment and biota in ponds from the A1 - A8 complex proposed for acquisition of fee title are similar to ambient Bay concentrations or are at levels that are not of concern and therefore, should not preclude the acquisition of those ponds. However, since ambient mercury levels in the South Bay are elevated, monitoring of the fish and wildlife utilizing the ponds is appropriate.
- Future decisions on initial stewardship and long-term restoration and management actions on all ponds should take into consideration the elevated mercury levels. This is most critical for ponds FWS already owns (A9 to A17) but will be acquiring the water management rights as they have the highest mercury concentrations and bioaccumulation in biota has reached levels that could cause reproductive impairment in fish eating birds (terns) that feed and nest in the area. The schedule of upstream remediation, restoration, and flood control activities that will affect loading of new mercury into the system should also be considered in the planning effort.
- A multidisciplinary monitoring and research program to address mercury methylation and bioaccumulation in the South Bay should be developed in concert with initial stewardship and long-term restoration and management actions. This work will provide information and recommendations to managers on potential actions that can be taken to reduce the hazards of mercury in the South Bay.
- Remediation of the ponds is not recommended at this time. This is because mercury contamination is widespread in South San Francisco Bay, its sources are off-site, and it will continue to impact the ponds until these off-site sources are addressed. Even if

off-site sources are controlled, it may not be feasible to address mercury contamination other than through management actions. FWS is not requiring remediation of mercury from Cargill Salt.

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