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**San Francisco Electric Reliability Project  
Waste Management and Soils and Water Resources  
Supplemental Testimony**

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**Introduction**

This testimony supplements the Staff's FSA testimony in the areas of Waste Management and Soil and Water Resources. The purpose of the testimony is to describe the site characterization information that has been developed for the project site since the FSA was published, to describe the range of remedial action that may be appropriate, and to propose performance standards for the protection of public health, worker safety, and environmental protection. These measures will be set forth in a removal action workplan (RAW) as directed by the San Francisco Bay Regional Water Quality Control Board (Regional Board).

Using the site characterization materials discussed below, the Applicant will provide further studies, including a health risk assessment and ecological risk assessment, to the Staff and the Regional Board, DTSC, and San Francisco Department of Public Health. Under state law, and within the context of these interagency consultations, the SFRWQB, as the state's "administering agency" for cleanups at hazardous material release sites, will determine what measures are required for site remediation.

**Site Characterization**

Previous initial but non-comprehensive site investigations conducted at the San Francisco Electric Reliability Project (SFERP) location had indicated that soil and groundwater contamination was present. However, the identity and quantity of contaminants present at the site, as well as their lateral and vertical extent, had not been defined to the extent needed to prepare a site-specific human health risk (HRA) assessment, an ecological risk screening evaluation, a site Risk Management Plan (RMP), and a Site Management Plan, or to conduct remedial action. The applicant recently conducted further site contamination assessment activities, as per proposed Condition of Certification **Waste-6**. Proposed Conditions of Certification of the original **Waste-7** and **Soils and Water-6** would require the project owner to prepare the site specific evaluations mentioned above. Please note that because the applicant has already complied with proposed **Waste-6**, staff is withdrawing this Condition of Certification and the original **Waste-7** now becomes **Waste-6**. An addition has also been added to the Verification of new **Waste-6**, and a supplemental condition, **Soil and Water-13** is being proposed. The purpose of **Waste-6** and **Soil and Water-13** is to provide assurance to the public that public health and safety will be maintained during the site remediation process, regardless of the specific remedial technology used.

Staff has reviewed the results of the sampling and analysis of soil, groundwater, and soil gas. Regarding human health risk posed by these contaminants, staff has

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determined that the identity and concentrations of contaminants at this site, if unmitigated, will pose a significant risk to construction workers. The project owner will be required to prepare a HRA and a site RMP to estimate the risk to workers, as well as the off-site public, and to provide mitigation to protect workers (and if needed, the public) so as to reduce the risk to less than significant levels. The Final Staff Assessment (FSA) described some of the standard mitigation used to protect on-site workers and the public. These include soil migration control methods, removal of areas of soil containing the highest levels of contaminants (“hot spots”) and subsequent transportation to a licensed hazardous waste treatment or disposal facility, dust control, the use of personal protective equipment, de-watering trenches so that skin contact with contaminated groundwater is avoided, and other standard mitigation measures described below.

### **Data Results**

In February 2006, soil and groundwater samples were collected at the SFERP site and analyzed for Total Petroleum Hydrocarbons (TPH), Volatile and Semi-Volatile Compounds (VOCs and SVOCs), Polynuclear Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), California Administrative Manual “CAM-17” metals, Asbestos, and chlorinated herbicides. A comparison of the SFERP sample results to the Regional Board Environmental Screening Levels (ESLs) was conducted. For soils, Table B Soils, Commercial/Industrial Land-use in areas where groundwater is not a source of drinking water, was used for the comparisons. For groundwater comparisons, SF RWQCB Estuarine ESL’s Table F was used, given the proximity of the SFERP site to San Francisco Bay.

The recent sampling and analyses indicated that there are several carcinogenic PAH and SVOC constituents that were detected at levels greater than one thousand times the industrial soil ESLs in one soil sample and exceed the ESLs in several other samples. Metals and TPH were detected in several soil samples at levels between ten times and one hundred times greater than the industrial ESLs. Arsenic levels in groundwater were more than one thousand times greater than the water ESLs in one monitoring well and over one hundred times the ESL in several monitoring wells. TPH levels are elevated in groundwater samples across the site; with several samples more than ten times greater than the ESL. Several wells with PAH levels between ten times and one hundred times the ESL were encountered. Groundwater sampling results closest to San Francisco Bay had elevated levels of metals including, arsenic, copper, and mercury that were ten times to one hundred times the ESLs; TPH almost ten times the ESL, and PAHs above the ESLs. The contaminant concentrations encountered in groundwater at the well closest to the Bay suggests that contamination may be migrating towards San Francisco Bay. No fate and transport analysis of onsite contamination has been conducted as yet by the applicant; therefore, it is uncertain if soil and groundwater contamination poses a significant risk to San Francisco Bay.

In addition, total (trivalent and hexavalent) chromium levels at three soil sample locations were much higher than at other locations and appear to correlate with higher nickel levels as well. This could be waste from past plating operations and thus the

chromium could consist of hexavalent chromium, as well as the more prevalent trivalent chromium. Hexavalent chromium is much more toxic than trivalent chromium; increasing risk levels substantially. The lab provided total chromium analysis and did not determine the percent of each. Without speciation, Department of Toxic Substance Control (DTSC) and Office of Environmental Health and Hazard Assessment (OEHHA) direct that 5percent total chromium be treated as hexavalent chromium. That alone will pose a risk  $>1 \times 10^{-6}$  for the offsite receptor at the fenceline. Based on this, either speciation of chromium should be conducted or the HRA must include air dispersion modeling of dust migration off-site using standard assumptions regarding hexavalent chromium. Remedial measures that can control exposure and reduce risks to acceptable levels also include “hot-spot” removal and/or stringent dust control methods during excavation and soil disturbance. Indoor inhalation risk to workers in a building on the site due to vapor intrusion of soil gas (using the DTSC J-E vapor intrusion model) are  $1.7 \times 10^{-5}$  and a Hazard Index of 1.1, mostly due to vinyl chloride (risk= $1.5 \times 10^{-5}$ ).

### **Discussion**

Remedial action other than the applicant’s “cap and maintain” alternative may be needed. Such additional remediation can be limited to the removal of small “toxic hot spots” and the implementation of groundwater extraction (and perhaps dual phase extraction) and treatment. Staff also recognizes that some onsite contamination may be mitigated through natural attenuation over time; particularly organic compounds through biodegradation.

The preparation of the required human health risk assessment, ecological risk screening assessment, and the site management plan will help guide what remedial measures are needed, based on consultations with the Regional Board and Cal EPA Department of Toxic Substance Control (“DTSC”). Adherence to the Cal EPA Department of Toxic Substance Control Removal Action Workplan (RAW) guidance (DTSC “Removal Action Workplans”, September 28, 1998) will assist the project owner in determining the remedial actions needed and thus should be incorporated into the Site Management Plan to be prepared per proposed **Waste-6**.

The RAW requires the following elements:

- **Site Description.** This would include a brief site history, land-use, ownership, site characterization activities conducted, and the nature and extent of contamination.
- **Goals to be achieved by removal action.** Specific clean-up goals should be based on an ecological and human health risk analyses.
- **Sampling and Analyses Plan.** A Sampling and Analyses Plan will ensure the effectiveness of any cleanup actions.
- **Removal action alternatives considered and rejected** (at least three). This will include preparation of an Engineering Evaluation/Cost Analysis (EE/CA). Alternatives could include no action, fixation of soils, and the construction of a groundwater barrier; both reactive and non-reactive. An initial analysis by staff suggests that soil removal, pump and treat, and vapor extraction will be the most likely treatment alternative(s).

- **Description of techniques and methods.** This would include any excavation, storing, handling, treatment, and disposal of material off-site. If excavation and off-site removal is the preferred alternative, then, to alleviate public concerns, a traffic plan will be included that outlines the proposed disposal route and location of disposal.
- **Health and Safety Plan.** The Health and Safety Plan will ensure the safety of workers engaged in remediation activities as well as the public at large. For example, if excavation was a chosen remediation alternative, then air monitoring would be conducted to ensure that dust and vapors did not adversely affect onsite and off-site receptors; including the public.
- **Community profile report.** Notice of the RAW in a newspaper of general circulation with a 30-day comment period. Preparation of a summary of comments received. Significant public interest may require the holding of a public meeting.
- **Administrative record list.** A list will be maintained of all records associated with the RAW.

Any selected remediation alternative will be protective of public health and the environment if the RAW guidance is followed. The RAW guidance indicates the various protective measures appropriate for remediation efforts. Soil contamination has been encountered at the site in concentrations exceeding human health and ecological risk standards. Because these concentrations are mostly encountered in small, isolated areas of the site, excavation and offsite disposal is the most likely remedial alternative that will be conducted. Public health and safety will be maintained by requiring the following:

1. Providing for dust monitoring and control during excavation and ensuring that any soil temporarily stored on-site is covered;
2. Soils taken off-site will be covered as well.
3. The disposal route presented by the applicant in a traffic plan, and the traffic plan will be made available to the public; and
4. The site would be securely fenced with access limited to authorized personnel for the duration of removal activities.

Soil vapors have been encountered at the site in concentrations exceeding human health risk standards. Assuming remediation regarding soil vapors is found necessary after consulting with the Regional Board and DTSC, the most common measure for removing soil vapors is by applying a vacuum to the surrounding soil and drawing vapors into a vapor well and out to a carbon filtration system or thermal oxidation unit for capture or destruction of the vapors. Vapors would be monitored during removal to ensure that they did not pose a hazard to the public or onsite workers.

Groundwater contamination is present at the site at concentrations that exceed ecological risk criteria. Assuming remediation regarding groundwater is found necessary after consulting with the Regional Board and DTSC, the most common measure for removing contaminated groundwater is by using a pump and an above-ground treatment system. This basically consists of using a well with a pump installed

in it that creates a cone of depression in the groundwater table; controlling the flow of groundwater off site while at the same time withdrawing contaminated water for treatment at the surface. Contaminated water at the surface is normally passed through a carbon filtration unit; with the waste water sent into the sanitary sewer. To ensure the safety of the public, if such a unit is required, it will have an automatic shut-off system in case of a leak or related discharge.

The measures described above, as well as the further requirements in the RAW, will assure that any selected remedial alternative approved by the Compliance Project Manager will be protective of human health and the environment. As stated in the Waste Management section of the FSA, staff's method and threshold for determining significance reads as follows: "The second method approach involves the preparation of a site-specific Human Health Risk Assessment and/or Ecological Risk Assessment". The human health risk assessment would follow Cal-EPA guidelines and must address all affected populations including the most burdened and compromised receptors. Staff would require the applicant to prepare such an assessment and would require some form of remediation if the human health cancer risk exceeded one-in-one million or the non-cancer hazard index exceeded 1.0, per 42 U.S.C. § 6922 (Resource Conservation and Recovery Act), California Health and Safety Code §25100 et seq. (Hazardous Waste Control Act of 1972, as amended), and Article 22A of the San Francisco Health Code. An ecological risk screening evaluation or risk assessment would be required if contaminants might pose a risk to biological receptors. The applicant also would follow Cal EPA and Regional Board guidelines and if the ecological risks were significant, appropriate mitigation might be required. Therefore, with the adoption of the Condition of Certification new **Waste-6** and **Soils and Water-13**, the proposed project would result in a less than significant impact to soil and water resources, and to public and worker safety and health.

**WASTE-6** The project owner shall prepare a human health risk assessment work plan in narrative outline form addressing soil and groundwater contamination on the site and submit this work plan to the Regional Board for review and comment and to the Compliance Project Manager (CPM) for review and approval. The project owner shall also prepare:

- a) a Human Health Risk Assessment,
- b) an Ecological Risk Screening Assessment using site-specific groundwater concentrations compared to SFBRWQCB 2005 ESLs,
- c) a revised site-specific Risk Management Plan (RMP), and
- d) a site specific Site Management Plan (SMP).

The Site Management Plan shall be prepared as per the DTSC Removal Action Workplan (RAW) guidance. All four of these reports shall be submitted to the Regional Board and the SF Department of Health for review and comment and to the CPM for review and approval. The project owner shall also enter into an agreement with the Regional Board to extend the MUNI site deed restriction to the power plant site.

**Verification:** At least sixty (60) days prior to the start of site mobilization, the project owner shall provide: (a) a revised Human Health Risk Assessment addressing soil and groundwater contamination on the site, (b) an Ecological Risk Screening Assessment, (c) a revised site-specific Risk Management Plan (RMP), and (d) a revised site-specific Site Management Plan (SMP) to the Regional Board and SF Department of Public Health for review and comment and to the CPM for review and approval. Documentation that the existing MUNI site deed restriction covers the power plant site shall be submitted to the CPM. When reviewing the SMP, the CPM will ensure that the elements of the RAW format and guidance are included in the proposed remedial action of the SMP. Remedial measures approved by the CPM shall ensure that the risk to the off-site public shall not exceed  $1 \times 10^{-6}$  and the Hazard Index shall not exceed 1.0, and the risk to site construction and operations workers shall not exceed  $1 \times 10^{-5}$  and a Hazard Index 1.0.

### **Supplemental Condition**

**SOIL & WATER-13** The project owner shall use the DTSC Removal Action Workplan (RAW) format and guidance in the process of remediation of the SFRP site that will be included as part of the SMP required in COC Soil and Water 6. The DTSC RAW guidance will be followed to ensure the safety of public health and the environment. Remedial measures shall be selected to ensure that the risk to the off-site public shall not exceed  $1 \times 10^{-6}$  and the Hazard Index shall not exceed 1.0, and the risk to site construction and operations workers shall not exceed  $1 \times 10^{-5}$  and a Hazard Index 1.0. For ecological risk, the cumulative Hazard Index shall not exceed 1.0. The SFRWQCB may provide alternative cleanup standards, if needed.

**Verification:** When reviewing the SMP, the CPM will ensure that the elements of the RAW format and guidance are included in the proposed remedial action of the SMP.