



City and County of San Francisco
DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH

Edwin M. Lee, Mayor
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Acting Environmental Health Director

November 10, 2015

Karen Toth
Department of Toxic Substances Control
700 Heinz Avenue, Suite 200
Berkeley, CA 94710-2721

Subject: Soluri Meserve Letter – October 23 2015
Mission Bay Development Contamination

Dear Ms. Toth:

This letter is in response to the above cited letter that our Planning Department, working on behalf of the successor agency to the San Francisco Redevelopment Agency, forwarded to us concerning the site of the proposed Warriors Event Center and Mixed Use Development Project ("Project"). The letter puts forth the view that the San Francisco Regional Water Quality Control Board ("San Francisco RWQCB"), designated in 1997 by the California EPA Site Designation Committee under Chapter 6.65 of the California Health and Safety Code as the administering agency for the entire Mission Bay Redevelopment Area, has failed to adequately manage risks at the site and DTSC should take over.

The San Francisco Department of Public Health, Environmental Health Branch, Site Assessment and Mitigation ("EHB-SAM") has worked with the San Francisco RWQCB since 1999 in assuring compliance with the remediation plan approved by the San Francisco RWQCB for the site. It therefore seems appropriate to send you some additional information regarding EHB-SAM role in regulatory oversight at Mission Bay and in particular at the Project location.

The San Francisco RWQCB approved a Risk Management Plan for the Mission Bay site ("RMP") and issued a certificate of completion in 1999 for all issues except those pertaining to petroleum contamination in one area of the site. (See Attachments.) The approved RMP included an Appendix F, with the text of SFHC Article 22A. The SFHC Article 22A has been updated since the RMP approval and EHB-SAM and the Department of Building Inspection ("DBI") require all Mission Bay developers to comply with the version of SFHC Article 22A in effect at the time a building permit is sought. This letter explains the current requirements.

In accordance with SFHC Article 22A and the Building Code, Section 106.3.2.4 – Hazardous Substances, EHB-SAM has the authority to oversee assessment and mitigation of sites that move greater than 50 cubic yards of soil in designated areas of San Francisco. The designated areas include the former 1851 shoreline of San Francisco, industrial areas, sites within 100 feet of a former or current underground storage tank (UST), sites within 150 feet of a raised freeway or areas believed to be impacted with hazardous substances.

The entire Mission Bay site is subject to the requirements of SFHC Article 22A and each developer must comply with its requirement prior to obtaining a building permit under the Building Code Section 106.3.2.4. Under SFHC Article 22A, EHB-SAM requires site specific sampling to occur for each development or project within the Mission Bay Area, compliance with the RMP, a health and safety plan and a dust control plan.

Specific requirements related to site sampling include an initial site assessment (Phase I report); a workplan for subsurface investigation if needed; a site characterization report (Phase II report); and a site mitigation plan if hazardous substances are detected above California hazardous waste levels, Regional Water Quality Control Board's (RWQCB) Environmental Screening Levels (ESLs) or Department of Toxic Substances Control (DTSC) California Human Health Screening Levels (CHHSLs). The site mitigation plan must address how any detected hazardous substances above these levels will be addressed in light of the planned development. SFHC Article 22A requires any subsurface investigation to sample soil, soil vapor and ground water. Analytical requirements include CAM 17 metals, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), polychlorinated bi-phenyls (PCBs), pH, cyanides, methane, and Total Petroleum Hydrocarbons (TPH).

EHB-SAM supplements Mission Bay RMP dust control requirements by also requiring compliance with SFHC Article 22B, which applies throughout the City and regulates construction-related dust emissions for projects greater than one-half acre. Article 22A also requires submittal to EHB-SAM of a Site Specific Health and Safety Plan two weeks prior to the commencement of work that contains specified elements. While it is the legal responsibility of the site owner and not EHB-SAM to assure that the plan satisfies applicable worker safety regulatory standards, EHB-SAM requires proof that the owner has prepared a plan with the specified elements before the work can proceed.

Since 1999-2000 EHB-SAM has reviewed and responded to all developments within the Mission Bay Area in accordance with SFHC Article 22A including those that require methane or vapor mitigation. The SFHC Article 22A requirements include the requirement to submit a final report at the completion of the project documenting compliance with the approved Site Mitigation Plan. EHB-SAM confers with RWQCB on all Mission Bay projects prior to issuing a certification letter indicating compliance is complete.

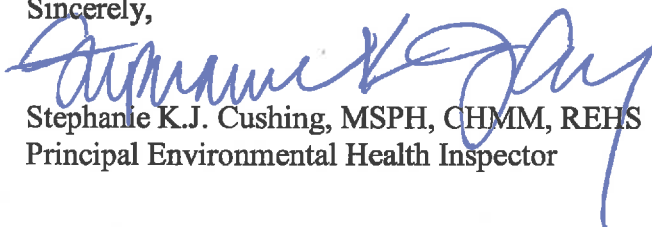
EHB-SAM has reviewed numerous documents for the Warriors Arena and Event Center. The reports include: a Phase 2 Environmental Site Assessment (June 2015, which included results from investigations in 2014 and 2015), a Site Mitigation Plan (June 2015), a Dust Monitoring Plan and two plan revisions (June 2015, July 2015, October 2015), and e-mails regarding potholing on 3rd Street (June 2015). In the site mitigation plan, Langan Treadwell and Rollo (LTR) indicated that the Phase 2 investigation showed fill material beneath the site contains petroleum hydrocarbons, low concentrations of SVOCs, elevated chromium, lead and nickel. Based on the presence of these compounds, site mitigation plan developed objectives to minimized exposure to construction workers, nearby residents and/or pedestrians and future site users. The site mitigation plan included: soil management, soil segregation, treatment and disposal, soil disposition, additional soil sampling, odor control, contingency procedures and the

statement that the contractor shall write and establish a health and safety plan that is to minimize worker and public exposure.

On July 13, 2015, EHB-SAM approved the Site Mitigation Plan. On September 15, 2015, EHB-SAM conditionally approved the Dust Monitoring Plan, and after receiving proposed revisions approved a revised dust monitoring control plan on November 3, 2015. Attached are the July 2015 site mitigation plan approval letter and the November 2015 dust monitoring control plan approval letter from EHB-SAM to the Warriors.

Should you have any questions about EHB-SAM oversight of projects at Mission Bay please feel free to contact me at (415) 252-3926 or Martita Lee Weden at (415) 252-3938.

Sincerely,

A handwritten signature in blue ink, appearing to read "Stephanie K.J. Cushing".

Stephanie K.J. Cushing, MSPH, CHMM, REHS
Principal Environmental Health Inspector

cc: Randy Lee, RWQCB
Chris Kern, Planning
Joy Navarrete, Planning



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Acting Environmental Health Director

July 13, 2015

Steve Collins
Golden State Warriors Arena
1011 Broadway
Oakland, CA 94607
Scollins@warriors.com

**Subject: SITE MITIGATION PLAN APPROVAL
GOLDEN STATE WARRIORS ARENA
BLOCKS 29 - 32, SAN FRANCISCO, CA 94158
EHB-SAM No.: SMED 1154**

Dear Mr. Collins:

In accordance with the San Francisco Health Code, Article 22A and the Building Code, Section 106.3.2.4 – Hazardous Substances; the San Francisco Department of Public Health, Environmental Health Branch, Site Assessment and Mitigation (EHB-SAM) has reviewed the following documents:

- Phase 2 Environmental Site Assessment, Golden State Warriors Arena, Blocks 29 Through 32 - Mission Bay, San Francisco CA, prepared by Langan Treadwell Rollo, June 2015
- Site Mitigation Plan, Golden State Warriors Arena, Blocks 29 Through 32 - Mission Bay, San Francisco CA, prepared by Langan Treadwell Rollo, June 2015
- Dust Monitoring Plan, Golden State Warriors Arena, Blocks 29 Through 32 - Mission Bay, San Francisco CA, prepared by Langan Treadwell Rollo, June 3, 2015
- Email RE: Potholing along 3rd Street, prepared by Dustyne Sutherland of Langan Treadwell Rollo, June 9, 2015
- Email RE: Potholing along 3rd Street with a Temporary Stockpile of Less Than 50 yd³, prepared by Adam Brown of Langan Treadwell Rollo, June 17, 2015

Site Description and Proposed Project

The site is located within an area bound by Third Street on the west, South Street on the north, Terry A. Francois Boulevard on the east and 16th Street on the south, as shown on Figure 1. The project area has approximate plan dimensions of 760 by 620 feet and encompasses approximately 10.9 acres.

The proposed development will consist of three main areas. Additionally, Terry A. Francois Boulevard will be re-aligned to run north to south on the east side of Blocks 30 and 32, in accordance with the Mission Bay master infrastructure plan following arena construction; note that the realignment of Terry A. Francois Boulevard is not addressed in the report.

- Arena – The arena structure will be approximately eight stories high. The arena has a total planned excavation depth of 12 feet bgs.
- Parking and Plaza – The parking and plaza will consist of parking, restaurants, retail and office buildings up to 11 stories high. The parking and plaza areas have a total planned excavation depth of 24.5 feet bgs. Some portions of the plaza area will not include subgrade parking and have a total excavation depth to approximately 14 feet bgs.
- Practice Courts – The practice court has a total planned excavation depth of 18.5 feet bgs.
- Conduct pothole activity along the sidewalk parallel to 3rd street, South Street, and 16th Street. The total amount of material disturbed will be limited to less than 50 yd³. The goal of this task is to look for an existing joint utility trench which if present will impact the current design of the parking structure. Potholes will be excavated and material will be stockpiled onsite per the requirements in the SMP. Each pothole will be securely covered after excavation and will be backfilled with the removed stockpiled material once the survey of the joint trench is complete. The contractors propose that the material be stockpiled for the duration of the pothole survey, which is approximately 1 week. The excavated material would then be used to backfill the pothole locations. Stockpiling of material would only be temporary. The contractor and subcontractor will follow the SMP for proper soil handling procedures and will implement proper dust control as outlined in an approved DMP.

The property is identified as San Francisco County Assessor's Parcel Number: Block 8722, Lot 001.

Historical Site Usage

Originally, the site was below water in a shallow bay known as Mission Bay. The tip of historic Point San Quentin was located just south of the site, along the 1852 San Francisco shoreline. Starting in the late 1860s, Mission Bay was reclaimed by placing fill. A review of historic maps and documents indicates that the site was reclaimed starting around 1869 with soil and rock from nearby Irish Hill and the Second Street cut. Filling of the site was completed between 1906 and 1910 with fill and building rubble from the 1906 San Francisco earthquake. In addition, a structure named Long Bridge was constructed along what is now 3rd Street; this structure was a timber pile-supported bridge that crossed Mission Bay from north to south.

The 10.9 acre site is vacant with paved parking areas (portions of Blocks 29 through 31) and an unpaved vacant lot (Block 32). With the exception of an area in the southern portion of the site, the ground surface is relatively flat, with elevations ranging from about 99 to 103 feet. There is a

depressed area in the southern portion where an excavation was performed for an environmental cleanup and partially backfilled.

The site is located at the Pier 64 area of Mission Bay, historically used for a variety of industrial purposes primarily related to bulk oil storage and transfer operations. Former operations included the following:

- Bulk fuel storage and distribution (approximately 1902 to 1966).
- Railroad operations (approximately 1904 to 1939).
- A machine shop (approximately 1904 to 1927).
- A boiler house (approximately 1904 to 1927).
- Steel mill (approximately 1906 to 1928).
- Well casing manufacturer (1907 to 1975).
- Warehousing, shipping, and receiving operations for a variety of products including agricultural chemicals, lumber, food, automobiles, metals, etc. (approximately 1910 to 2006).
- A fruit cannery (approximately 1935 to 1961).
- Junk yards, vehicle parking, and vehicle maintenance facilities (approximately 1950 to 2004).
- Ready-mix concrete facilities (approximately 1972 to 2010).

Subsurface Conditions

Langan and others have completed previous geotechnical and environmental investigations at the site. A profile location map showing historical boring locations and two idealized subsurface profiles (Appendix A, Figures A-1 through A-3) illustrate the general subsurface conditions, consisting of fill, Bay Mud, Colma Formation sand, sand layers, Old Bay Clay, and bedrock (Langan, 2011). Boring logs from the December 2014 and January 2015 investigation are presented in Appendix A. Where explored, the site is blanketed by approximately 7 to 25 feet of fill overlying Bay Mud. The fill consists of gravel, sand, and clay mixtures, with brick, rock (including serpentinite), and other rubble. The sand and gravel are loose to very dense, and the clay is soft to stiff. The fill likely also includes cobble- and boulder-sized pieces of serpentinite and other materials that were apparent from the drilling but could not be recovered from the samplers. The Bay Mud is a weak and compressible marine clay deposit. This layer ranges from about 2.5 to 46.5 feet thick, generally becoming thicker to the north. Based on the physical setting of Mission Bay, the elevation of the Bay Mud varies across the site, hence the fill thickness also varies.

A medium dense to very dense clayey sand, silty sand and sand with clay and stiff to hard sandy clay, clay with sand and clay was encountered below the Bay Mud. Where encountered the sand and clay layers total 3 to 31 feet thick. A medium dense to very dense sand, sand with clay, clayey sand, silty sand and sand with silt, known as the Colma Formation, was encountered below the sand and clay in portions of the site. The top of the Colma formation was encountered about 19 to 70 feet bgs. Where encountered, the sand is approximately 5 to 35 feet thick. The Colma Formation generally becomes thicker to the north and west.

A stiff to hard clay known as Old Bay Clay, very stiff to hard sandy clay, clay, gravelly clay with sand and clay with gravel and dense to very dense sand with silt and clayey sand were encountered below the Colma Formation to bedrock. Bedrock was encountered at depths ranging from 32 to 130 feet. Bedrock generally becomes deeper to the northwest and consists of serpentinite, greenstone, shale, and claystone of the Franciscan Complex. The rock is crushed to intensely fractured, soft to moderate hardness, and friable to weak, with deep to moderate weathering.

As part of data collection for construction dewatering and structural design efforts, three piezometers (PZ-01 through PZ-03) were installed on 18 September 2014 by Langan. Groundwater has been measured in PZ-01, PZ-02, and PZ-03 on site at approximately 6.5 to 12 feet bgs. In PZ-01, depth to groundwater has been influenced by a periodic dewatering system located to the south and adjacent to the Site at 16th and Terry A. Francois Boulevard. Local groundwater flow patterns vary in this area due to the heterogeneous nature of the fill and tidal fluctuations, but the overall direction of shallow groundwater flow at the site is generally southeast toward San Francisco Bay.

Previous Investigations and Remedial Actions

Past activities within the Pier 64 area, specifically at the former petroleum terminals and related pipelines, significantly impacted environmental conditions at the site. On 15 June 2005, the Water Board adopted Order No. R2-2005-0028, which set forth the final cleanup requirements and redefined the Pier 64 area into six OUs. Portions of the site within the North Terminal OU include the southeastern portion of Block 29, southern portion of Block 30, eastern half of Block 31, and entirety of Block 32. Responsible parties for the investigation and cleanup of the Pier 64 area, including North Terminal OU, are ARCO, Chevron, Phillips, UNOCAL, and Texaco (collectively referred to as the "Pier 64 Group" - primary dischargers) and the City and County of San Francisco and Esprit (secondary dischargers).

One 13,500-gallon diesel underground storage tank (UST), formerly operated by the Pacific Coast Bus/Franciscan Bus Line, was removed from Block 31 in 1987, and one 1,000-gallon gasoline UST, formerly operated by Filbert Warehouse Corporation, was removed from Block 32 in 1997. These USTs were located within the area of the separate phase hydrocarbons (SPH) plume in the North Terminal OU. Free product was present near the water table during removal of both USTs.

One 4,000-gallon diesel UST, one 10,000-gallon UST, and one 5,000-gallon gasoline UST were formerly located at the portions of Blocks 29 and 31. The USTs were permanently removed in 1995, followed by sampling and removal actions for localized soil and groundwater impacts. Tank closures were conducted under the authority of the SFDPH Local Oversight Program (LOP) and the Water Board. The LOP and Water Board issued case closure for these USTs in February 1995.

Mission Bay Subsurface Investigations in 1997 and 1998

Environ conducted several subsurface investigations in Mission Bay Blocks 29 through 32 in 1997 and 1998. Total petroleum hydrocarbons as diesel (TPHd) and TPH as motor oil (TPHmo)

were detected in soil and groundwater, in areas of former bulk petroleum storage, pipelines and transfer facilities. A measureable amount of SPH was observed at the groundwater table in two areas within Blocks 29 and 32. Metals were detected in soil at concentrations typically associated with Mission Bay fill materials. Asbestos was detected in soil and was attributed to the likely presence of Serpentine bedrock, a common constituent in Mission Bay fill material. The SPH areas of impact were subsequently remediated as discussed below.

Phase I Remedial Excavation in 2001

The Phase I remedial action was implemented by Clayton in 2001. Approximately 14,020 tons of visibly stained soil was excavated to a depth of 2 feet below the groundwater surface (to approximately 9 feet bgs). SPH was removed from the exposed groundwater surface within the excavation and an SPH collection trench and high-density polyethylene (HDPE) sheeting was installed along the western edge of the excavation to minimize the lateral migration of floating SPH. Soil containing residual oil below the target zone was left in place.

Phase II Remedial Excavation in 2005

A Phase II remedial action was completed within the Pier 64, including portions of the site, in 2005 through 2006. On-site activities included demolition and disposal of above ground structures, excavation and stockpiling of overburden soils, excavation of 90,000 tons of SPH impacted soils to a depth of approximately 2 feet below the ground water level (to approximately 9 feet bgs), dewatering, removal of SPH from the exposed groundwater surface, and backfilling the excavation. The excavation was backfilled using crushed concrete from on-site demolition activities and overburden from the respective operable units that met the Mission Bay RMP reuse criteria. On 22 December 2006, the Water Board issued a no further action letter to the Pier 64 Group for soil remediation activities within the Pier 64 OUs, including portions of the site.

Groundwater Monitoring

The Water Board required the Pier 64 Group to develop and implement a Groundwater Monitoring Program (GMP) to continue to assess groundwater quality. The GMP comprised approximately 20 active monitoring wells for the Pier 64 area. The Water Board approved ARCADIS' site closure request on 31 May 2013. Based on post-remediation groundwater monitoring results, the Water Board rescinded Order R2-2005-0028 and approved destruction of all on site monitoring wells. In June 2013, ARCADIS abandoned 20 monitoring wells at the Pier 64 area (ARCADIS, 2013).

Strata Phase I Environmental Site Assessment (ESA), September 2010

The significant findings identified in Strata's Phase I ESA report are related to the historic fill materials underlying the site and the past industrial site activities including oil bulk storage and transfer operations, railroad operations, warehousing, and vehicle maintenance operations. However, extensive soil and groundwater remediation activities have taken place at the site and the remaining environmental conditions can be effectively managed by the Mission Bay RMP.

Langan Phase I ESA Update, April 2010

Langan completed a Phase I ESA update on behalf of Strada in April 2014. Based the review of regulatory files, the site history, and site reconnaissance, this assessment revealed no substantial

changes, or additional recognized environmental concerns (RECs) at the site since the September 2010 Phase I ESA report was completed.

Phase 2 Subsurface Investigation (December 2014)

The initial phase investigation was completed in December 2014. The initial sampling also included the collection of groundwater samples from the three existing piezometers (PZ-1, PZ-2 and PZ-3).

In January 2015, the second step-out phase was conducted to further characterize hazardous waste types proposed for excavation and to facilitate off-site disposal and/or on-site treatment prior to off-site disposal. Additional borings and samples were collected near the initial phase borings at depths where chromium, lead, and nickel were present at levels that exceeded hazardous waste criteria. To assist with the dewatering and to evaluate if groundwater pretreatment will be required prior to discharge to the sanitary sewer and to confirm detections reported in December, PZ-01, P-02 and PZ-03 were sampled in March 2015 for ph, chloride and nickel.

As discussed on 14 November 2014 during a meeting with SFDPH regarding the draft Work Plan and based on the design plans that the structural slabs will be below the groundwater table, soil gas samples were not collected because methane vapor intrusion would not be a concern. The groundwater volatile organic compound (VOC) and total petroleum hydrocarbons as gasoline (TPHg) sampling results conducted as part of the initial investigation phase were compared to Water Board vapor intrusion Environmental Screening Levels.

On 22 and 23 December 2014, Gregg Drilling & Testing, Inc. (Gregg) of Martinez California, a C-57 licensed drilling company, advanced 15 borings using a combination direct push/hollow stem auger drill rig for the collection of soil samples within the three proposed areas of development (Arena, Parking and Plaza, and Practice Facility). On 10 December 2014, groundwater samples were collected from the three piezometers (PZ-1, PZ-2 and PZ-3). The sample locations and boring depths are shown on Figure 3.

Arena – Six borings (LB-6 through LB-9, LB-11 and LB-12) were drilled between 13 feet bgs and 22 feet bgs. Approximately four to six soil samples were collected from each boring at 2.5 to 5 foot intervals.

Parking and Plaza – Eight borings (LB-1 through LB-5, LB-10, LB-13 and LB-15) were drilled between approximately 12 feet bgs and 33 feet bgs. Approximately four to ten samples were collected from each boring at 2.5 to 5 foot intervals. Two groundwater grab samples were collected from the existing temporary piezometers PZ-1 and PZ-2.

Practice Facility - One boring (LB-14) was drilled to approximately 25 feet bgs. Approximately nine soil samples were collected from the boring at 2.5 to 5 foot intervals. One groundwater grab sample was collected from existing temporary piezometer PZ-3.

Soil Sampling

Soil samples were collected using dual-tube direct push drilling technology. Continuous soil cores were collected inside a sample barrel, lined with 5-foot-long clear acetate sample liners. The soil cores were visually logged by Langan's SBE subconsultant Albion Partners personnel in general accordance with the Unified Soil Classification System (USCS), using ASTM D-2488-09a, visual/manual procedure, working under the supervision of a Langan California professional geologist. Soil was screened for organic vapors using a calibrated photoionization detector (PID).

The selected soil sampling interval was cut from the acetate sample liner. The ends of each sample liner were covered with Teflon sheets, capped at each end, appropriately labeled, and placed in an ice filled chest cooled to 4°. The samples were submitted under chain-of-custody protocol to Curtis & Tompkins Laboratories (C&T) of Berkeley, California, a State of California certified laboratory. After the final sample was collected at each boring location, each soil boring was backfilled with neat cement grout delivered via a tremie pipe, under the oversight of an SFDPH inspector.

Soil samples were analyzed for some or all of the compounds listed below based on Table 1 of the Work Plan, visual observations, and PID readings:

- TPHg, TPH as diesel (TPHd), and TPH as motor oil (TPHmo) by Modified Environmental Protection Agency (EPA) Method 8015B;
- VOCs by EPA Method 8260B;
- Semi-volatile organic compounds (SVOCs) by EPA Method 8270C;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082;
- California assessment manual (CAM) 17 metals by EPA Method 6010 and EPA Method 7471A;
- Leaking Underground Fuel Tank (LUFT) 5 Metals (6010B);
- Total lead by EPA Method 6010;
- Asbestos by California AIR Resources Board (CARB 435);
- pH by EPA Method 9045D;
- Cyanide by Standard Method SM4500CN-E.

If metal concentrations exceeded the Total Threshold Limit Concentrations (TTLC) or if total metal concentrations exceeded the soluble threshold limit concentration (STLC) by 10 times, soil samples were analyzed by the California Waste Extraction (WET) Method to evaluate if the results exceed the State of California Class I hazardous waste criteria. If a soluble metal result exceeded the STLC, the sample was analyzed by Toxicity Characteristic Leaching Procedure (TCLP), to evaluate if the concentration exceeds the Resource Conservation and Recovery Act (RCRA) or federal hazardous waste criteria.

Groundwater Sampling

In December 2014, three on site piezometers (PZ-1 through PZ-3) were sampled to facilitate obtaining a batch waste water discharge permit for disposal of groundwater pumped during construction and to satisfy the Maher Ordinance requirements. Groundwater samples were collected in accordance with the low flow groundwater sampling procedures as outlined in the Work Plan. Groundwater samples were collected directly into laboratory-supplied and preserved sample containers, appropriately labeled, and stored in an ice-cooled chest until delivery to C&T.

Groundwater samples collected from piezometers PZ-1 through PZ-3 were analyzed for some or all of the compounds listed below:

- TPHd, and TPHmo by EPA Method 8015B following silica gel preparation by EPA Method 3630C;
- TPHg by EPA Method 8015B;
- VOCs by EPA Method 8260B;
- SVOCs by EPA Method 8270C SIM;
- CAM 17 Metals by EPA Method 6020 and EPA Method 7470A;
- LUFT 5 Metals by EPA Method 6010B;
- pH by EPA Method 9040C;
- Cyanide by Standard Method SM4500CN-E;
- Dissolved Sulfides by Standard Method SM4500S2-D;
- Total Suspended Solids by Standard Method SM5220D;
- Chemical Oxygen Demand by Standard Method SM5220D;
- Phenols by EPA Method 420.1; and
- Flashpoint by ASTM D-93.

January 2015 Field Investigation

From January 26 - 28, 2015, Gregg of Martinez California, a C-57 licensed drilling company, advanced 15 additional step-out borings using a combination direct push/hollow stem auger drill rig to facilitate the collection of soil samples. The purpose of the step-out boring program was to further profile the anticipated waste types identified in the December 2014 initial investigation and to delineate the top and thickness of the Bay Mud lithologic unit.

- Arena – Seven borings (LB-19 through LB-21, and LB-26 through LB-28 and LB-31) were drilled to total depths of between 15.5 feet bgs to 17 feet bgs. Two to five soil samples were collected from each boring.
- Parking and Plaza – Nine borings (LB-16 through LB-18 and LB-22 through LB-25 and LB-29 through 30) were drilled to total depths of between approximately 12 feet and 30 feet bgs. One to four samples were collected from each boring.
- Practice Facility - Two borings (LB-32 and LB-33) were drilled to a total depth of approximately 22 feet bgs. One soil sample was collected from each boring location.

March 2015 Groundwater Sampling

In March 2015, to assist with the evaluation of construction dewatering options and groundwater pre-treatment prior to discharge, piezometers PZ-1 through PZ-3 were sampled for ph, chloride and total nickel using the same methods discussed above in Section 5.2.2.

Analytical Results

Non Metal Compounds

TPHg was present above the laboratory reporting limit in 5 of the 44 samples analyzed at concentrations ranging from 1.5 milligrams per kilogram (mg/kg) to 9.9 mg/kg. TPHd was present above the laboratory reporting limit in 41 of the 44 samples analyzed at concentrations

ranging from 1.0 mg/kg to 1,300 mg/kg. TPHmo was present above the laboratory reporting limit in 35 of the 44 samples analyzed at concentrations ranging from 8.2 mg/kg to 1,800 mg/kg.

- 1,2,4-Trimethylbenzene was detected in 1 of 28 samples analyzed at a concentration of 0.0078 mg/kg;
- Acetone was detected in 11 of 28 samples analyzed at concentrations ranging from 0.019 to 0.17 mg/kg;
- Carbon disulfide was detected in 2 of 28 samples analyzed at concentrations ranging from 0.0079 to 0.0083 mg/kg;
- Ethylbenzene was detected in 1 of 28 samples analyzed at a concentration of 0.007 mg/kg;
- 2-Butanone was detected in 1 of 28 samples analyzed at a concentration of 0.032 mg/kg;
- o-xylene was detected in 1 of 28 samples analyzed at a concentration of 0.0068 mg/kg;
- m, p- xylenes was detected in 1 of 28 samples analyzed at a concentration of 0.011mg/kg.
- All other VOCs were not present above laboratory detection limits.

The following SVOCs were present above laboratory detection limits:

- Acenaphthene was detected in 1 of 29 samples analyzed at a concentration of 0.028 mg/kg;
- Acenaphthylene was detected in 5 of 29 samples analyzed at concentrations ranging from 0.011 mg/kg to 0.18 mg/kg;
- Anthracene was detected in 10 of 29 samples analyzed at concentrations of 0.012mg/kg to 0.14 mg/kg;
- Benzo(a)anthracene was detected in 12 of 29 samples analyzed at concentrations of 0.0058 mg/kg to 0.53 mg/kg;
- Benzo(a)pyrene was detected in 15 of 29 samples analyzed at concentrations of 0.005 mg/kg to 2.1 mg/kg;
- Benzo(b)fluoranthene was detected in 17 of 29 samples analyzed at concentrations of 0.0071 mg/kg to 1.9 mg/kg;
- Benzo(g,h,i)perylene was detected in 12 of 29 samples analyzed at concentrations of 0.0074 mg/kg to 1.8 mg/kg;
- Benzo(k)fluoranthene was detected in 9 of 29 samples analyzed at concentrations of 0.018 mg/kg to 0.42 mg/kg;
- Chrysene was detected in 15 of 29 samples analyzed at concentrations of 0.0069 mg/kg to 0.71 mg/kg;
- Dibenz(a,h)anthracene was detected in 5 of 29 samples analyzed at concentrations of 0.019 mg/kg to 0.53 mg/kg;
- Fluoranthene was detected in 16 of 29 samples analyzed at concentrations of 0.0087 mg/kg to 0.72 mg/kg;
- Fluorene was detected in 6 of 29 samples analyzed at concentrations of 0.012 mg/kg to 0.085 mg/kg;
- Indeno(1,2,3-c,d)pyrene was detected in 10 of 29 samples analyzed at concentrations of 0.0054 mg/kg to 1.7 mg/kg;
- Naphthalene was detected in 5 of 29 samples analyzed at concentrations of 0.0098 mg/kg to 0.74 mg/kg;

- Phenanthrene was detected in 17 of 29 samples analyzed at concentrations of 0.0078 mg/kg to 0.39 mg/kg; and
- Pyrene was detected in 17 of 29 samples analyzed at concentrations of 0.0074 mg/kg to 0.9 mg/kg.

All other SVOCs were not detected above laboratory reporting limits.

The PCB Aroclor 1254 was detected in 1 of 7 samples analyzed at a concentration of 0.016 mg/kg. All other PCBs were not present above laboratory detection limits. Cyanide and sulfide were not detected above laboratory limits in any of the samples analyzed.

Metals

- Antimony was detected in seven out of 17 samples analyzed at concentrations ranging from 0.28 mg/kg to 5 mg/kg
- Arsenic was detected in 15 out of 17 samples analyzed at concentrations ranging from 0.3 mg/kg to 13 mg/kg
- Barium was detected in 17 out of 17 samples analyzed at concentrations ranging from 3.9 mg/kg to 360 mg/kg
- Beryllium was detected in 11 out of 17 samples analyzed at concentrations ranging from 0.26 mg/kg to 0.45 mg/kg;
- Cadmium was detected in 31 out of 44 samples analyzed at concentrations ranging from 0.31 mg/kg to 1.7 mg/kg
- Cobalt was detected in 17 out of 17 samples analyzed at concentrations ranging from 3.9 mg/kg to 93 mg/kg
- Copper was detected in 17 out of 17 samples analyzed at concentrations ranging from 5.6 mg/kg to 110 mg/kg
- Mercury was detected in 12 out of 17 samples analyzed at concentrations ranging from 0.033 mg/kg to 0.58 mg/kg
- Molybdenum was detected in 9 out of 17 samples analyzed at concentrations ranging from 0.45 mg/kg to 6.7 mg/kg
- Silver was detected in 3 out of 17 samples analyzed at concentrations ranging from 0.31 mg/kg to 0.99 mg/kg
- Vanadium was detected in 17 out of 17 samples analyzed at concentrations ranging from 17 mg/kg to 50 mg/kg
- Zinc was detected in 44 out of 44 samples analyzed at concentrations ranging from 15mg/kg to 420 mg/kg.

Selenium and thallium were not detected above laboratory reporting limits. The detected metal concentrations discussed above were within normal background ranges found in northern California soils as stated by the consultant.

Total chromium was detected in 59 out of 59 samples analyzed at concentrations ranging from 27 mg/kg to 1,800 mg/kg. Forty two soil samples were analyzed for soluble chromium using the STLC by WET method. Soluble chromium was detected in 36 out of 42 samples analyzed at concentrations ranging between 0.25 milligrams per liter (mg/L) and 16 mg/L. Of the samples analyzed eight failed the California Hazardous Waste Criteria of 5 mg/L. Twenty two soil

samples were analyzed for soluble chromium using the TCLP method. TCLP chromium was detected in four of the 22 samples analyzed at concentrations ranging from 0.051 mg/L to 0.12 mg/L. Of the samples analyzed by the TCLP method, none were above the Federal Hazardous Waste Criteria of 5 mg/L.

Total lead was detected in 107 out of 114 samples analyzed at concentrations ranging from 0.29 mg/kg to 1,500 mg/kg. Fifty eight soil samples were analyzed for soluble lead using the WET method. Soluble lead was detected in 56 out of the 58 samples analyzed at concentrations ranging between 0.51 mg/L and 77 mg/L. Of the samples analyzed for soluble lead, 30 results the STLC of 5 mg/L. Thirty seven soil samples were analyzed for soluble lead using the TCLP method. Soluble was detected in 29 of the 37 samples analyzed at concentrations ranging from 0.063 mg/L to 3 mg/L. Of the samples analyzed by the TCLP method, none were detected above the 5 mg/L Federal hazardous waste criteria.

Total nickel was detected in 62 out of 62 samples analyzed at concentrations ranging from 16 mg/kg to 2,400 mg/kg. Twenty two soil samples were analyzed for soluble nickel using the WET method. Soluble nickel was detected in 21 out of 22 samples analyzed at concentrations ranging between 0.7 mg/L and 86 mg/L. Of the samples analyzed for soluble nickel, seven exceeded the STLC of 20 mg/L. There is no TCLP established for nickel.

Groundwater Results

In the groundwater samples collected from PZ-1, PZ-2 and PZ-3, the following compounds were detected:

- Benzene was detected in PZ-1 at a concentration of 4.4 micrograms per liter (µg/L). No other VOCs were detected above laboratory reporting limits.
- Naphthalene was detected in PZ-1 at a concentration of 2.8 µg/L. No other SVOCs were detected above laboratory reporting limits.
- Chemical oxygen demand was detected in PZ-1 and PZ-2 at a concentration of 480,000 µg/L and 1,100,000 µg/L, respectively.
- Chlorides were detected in PZ-1, PZ-2 and PZ-3 at concentrations of 7,200 µg/L, 1,600 µg/L and 15,000 µg/L, respectively.
- Cyanide was detected in PZ-1 at a concentration of 10 µg/L.
- TPHg and TPHd were detected in PZ-1 at concentrations of 140 and 440 µg/L, respectively. TPHmo was not detected above the laboratory reporting limit.
- Total recoverable phenolics were detected in PZ-1 at a concentration of 330 µg/L.
- Sulfide was detected in PZ-1 at a concentration of 530 µg/L.
- Total suspended solids were detected in PZ-1 and PZ-2 at concentrations of 17,000 and 8,000 µg/L, respectively.
- The flashpoint of the water in PZ-1 and PZ-2 was 150 degrees Fahrenheit.
- pH ranged from a high of 11.8 in PZ-1 in December 2014 to a low of 7.1 in PZ-1 in March 2015.

Total Metals

In the groundwater samples collected from PZ-1, PZ-2 and PZ-3, the following total metals were detected:

- Antimony was detected in 1 out of 2 samples analyzed at a concentration of 1.3 µg/L.
- Arsenic was detected in 2 out of 2 samples analyzed at concentrations ranging from 2.2 µg/L to 8.1 µg/L.
- Barium was detected in 2 out of 2 samples analyzed at concentrations ranging from 68 µg/L to 1,600 µg/L.
- Beryllium was not detected in the samples collected from PZ-1 and PZ-3.
- Cadmium was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Chromium was detected in 1 of 3 samples analyzed at a concentration of 1.1 µg/L.
- Cobalt was detected in 1 out of 2 samples analyzed at a concentration of 1 µg/L.
- Copper was detected in 1 out of 2 samples analyzed at a concentration of 1.5 µg/L.
- Lead was detected in 1 of 3 samples analyzed at a concentration of 2.2 µg/L.
- Mercury was not detected in the samples collected from PZ-1 and PZ-3.
- Molybdenum was detected in 2 out of 2 samples analyzed at concentrations ranging from 6.6 µg/L to 39 µg/L.
- Nickel was detected in 6 out of 6 samples at concentrations ranging from 20 µg/L to 510 µg/L.
- Selenium was detected in 1 out of 2 samples analyzed at a concentration of 1.7 µg/L.
- Silver was not detected in the samples collected from PZ-1 and PZ-3.
- Thallium was not detected in the samples collected from PZ-1 and PZ-3.
- Vanadium was detected in 1 out of 2 samples analyzed at a concentration of 7.7 µg/L.
- Zinc was detected in 1 out of 3 samples analyzed at a concentration of 6.3 µg/L.
- 4.2.2.3 Dissolved Metals

- In the groundwater samples collected from PZ-1, PZ-2 and PZ-3, the following dissolved metals were detected:
- Antimony was not detected in the samples collected from PZ-1 and PZ-3.
- Arsenic was detected in 2 out of 2 samples analyzed at concentrations ranging from 1.8 µg/L to 7.6 µg/L.
- Barium was detected in 2 out of 2 samples analyzed at concentrations ranging from 58 µg/L to 1,500 µg/L.
- Beryllium was not detected in the samples collected from PZ-1 and PZ-3.
- Cadmium was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Chromium was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Cobalt was not detected in the samples collected from PZ-1 and PZ-3.
- Copper was detected in 1 out of 2 samples analyzed at a concentration of 1.2 µg/L.
- Lead was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Mercury was detected in 1 out of 2 samples analyzed at a concentration of 0.77 µg/L.
- Molybdenum was detected in 2 out of 2 samples analyzed at concentrations ranging from 5.5 µg/L to 38 µg/L.
- Nickel was detected in 3 of 3 samples at concentrations ranging from 18 µg/L to 510 µg/L.
- Selenium was detected in 1 out of 2 samples analyzed at a concentration of 1.9 µg/L.
- Silver was not detected in the samples collected from PZ-1 and PZ-3.
- Thallium was not detected in the samples collected from PZ-1 and PZ-3.
- Vanadium was detected in 1 out of 2 samples analyzed at a concentration of 6.3 µg/L.

- Zinc was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.

Conclusions and Recommendations by the Consultant

The fill unit was characterized as either a State of California Class I hazardous material based on soluble chromium, lead, and nickel concentrations or a Class II non-hazardous material, likely related to debris from the 1906 earthquake and resulting fire. Generally, the Class I California hazardous material extends from the surface to 24.5 feet bgs (the deepest layer is observed in the northeast corner of site adjacent to Terry Francois Boulevard). The areas of fill material containing soluble chromium, lead, and nickel concentrations exceeding the State of California hazardous waste criteria will be disposed of off-site at a Class-I non-RCRA regulated landfill. The current developer is also exploring soil treatment options to treat the Class I hazardous soil to a Class II non-hazardous soil. Additional fill material that will be excavated and disposed of off-site will most likely be disposed of as Class-II non-hazardous waste. Native material beneath the fill layer is typically disposed of as Class-III waste and/or unrestricted material.

In some boring locations (at depths greater than 6.0 feet bgs) within the former remedial excavation footprints, TPHmo and TPHd were detected at concentrations ranging between 800 mg/kg and 1,800 mg/kg. The TPH concentrations are likely associated with the historical fuel bulk storage and distribution terminal. A few volatile and semi-volatile organic compounds were detected at low concentrations that would not be a health concern to construction workers. Since soil with hazardous concentrations of chromium, lead, and nickel was identified during the Phase II ESA, soil excavation tasks carried out during redevelopment activities need to be completed in accordance with a SMP. The SMP will outline proper soil handling and disposal procedures to be implemented during construction.

Construction activities will require dewatering and the groundwater contains TPHd and TPHmo, low concentrations of benzene, naphthalene, metals and elevated chloride concentrations. The groundwater quality and anticipated discharge rates and volumes are currently being discussed with the San Francisco Public Utilities Commission (SFPUC) and Regional Water Quality Control Board to determine the appropriate discharge authorization, oversight agency and required treatment prior to discharge.

Site Mitigation Plan (June 2015)

The Mission Bay is under Regional Water Quality Control Board (Water Board) oversight and development activities must be conducted according to a Risk Management Plan (RMP) prepared for the Mission Bay project area (Environ, 1999). The RMP presents the decision framework and the specific protocols for managing chemicals in the soil and groundwater in a manner that is protective of human health and the ecological environment, consistent with the existing and planned future land uses, and compatible with long-term phased development. The RMP delineates the specific risk management measures that must be implemented prior to, during, and after development of each parcel within the Mission Bay area.

In February 2000, the City and County of San Francisco submitted the Covenant and Environmental Restriction for the entire Mission Bay development site. This covenant states that

the site must be developed in accordance with the 1999 Mission Bay RMP. Furthermore, the Water Board stated that rather than mandating the application of Title 27 of the California Code of Regulations (solid waste management unit regulations), each project at Mission Bay would be evaluated on a site-by-site basis for management of methane gas, if present at levels of concern. Based on the design plans that the structural slabs will be below the groundwater table, methane vapor intrusion is not a concern at the site as stated by the consultant.

The Phase II ESA results indicate that fill material beneath the site contains petroleum hydrocarbons, some low concentrations of SVOCs, and elevated concentrations of chromium, lead, and nickel. The presence of these compounds poses soil management and potential health risks to be addressed as part of the development activities. The site mitigation objectives are to minimize exposure of construction workers, nearby residents and/or pedestrians, and future site users to these constituents in the soil.

The general public will be protected through the following measures:

- The site will be fenced.
- Exposed soil will be watered frequently enough to prevent visible dust from migrating off-site.
- Soil stockpiles will be covered or stabilized with a soil binder if left idle for 7 days or more.
- Water will be misted or sprayed during the loading of soil onto trucks for off haul.
- Trucks transporting contaminated soil will be covered with a tarpaulin or other cover.
- The wheels of the trucks exiting the site will be cleaned prior to entering public streets.
- Public streets will be swept daily if soil is visible; excavation and loading activities will be suspended if the hourly average wind speed exceeds 25 miles per hour.
- The fence will be posted with no trespassing signs and signs in accordance with the requirements of the safe drinking water and toxic enforcement act (Proposition 65).

Soil Management

The proposed construction activities will disturb soil during the mass excavation, site grading, and the construction of new foundations and utility lines. During all soil disturbing activities, dust control measures will be implemented to reduce potential exposure. These measures may include moisture-conditioning the soil using dust suppressants and covering the exposed soil and stockpiles with weighed down plastic sheeting (or equivalent) to prevent wind-blown dust and erosion during rainfall events. The contractor's HASP will contain additional dust monitoring, action levels, dust control measures, and work stoppage provisions that will be followed during construction activities.

The construction activities will also be subject to the provisions of the State Water Resources Control Board Construction General Permit. Implementation of best management practices during the time construction is active will help minimize or prevent silt-laden stormwater from leaving the site. A site-specific stormwater pollution prevention plan will be prepared and implemented prior to the start of construction.

Soil Segregation, Treatment and Disposal

The excavated fill material that contains elevated concentrations of chromium, lead, and nickel, petroleum hydrocarbons, and low concentrations of VOCs and SVOCs will need to be disposed off-site at regulated landfills. Additional chemical testing of the soil may be required by the landfill prior to disposal. The areas of fill material containing soluble lead, chromium and/or nickel concentrations exceeding the State of California hazardous waste criteria are presented on Figure 3 in the report. These areas will be delineated prior to any excavation activities to ensure that the soil containing State waste levels are appropriately segregated. The remaining excavated fill material will be disposed of as Class II non-hazardous waste. The native material underlying the fill layer will most likely be removed as Class III and/or unrestricted waste. The excavation contractor shall be responsible for tracking the disposition of soil removed and hauled off-site.

It is the intention of the developer to treat soil that exceeds the State of California hazardous waste criteria before loading this soil into trucks for eventual disposal at an appropriately regulated landfill. The treatment process will take place on the site and the resultant soil will be re-tested to ensure the treatment process is successful. The treatment process will likely include mixing a concrete additive to the excavated hazardous soil via a pug mill or mixing the concrete additive in situ with rototilling type machinery. The concrete additive has the effect of reducing the solubility of the metals thereby treating the soil from a Class I California hazardous waste to a Class II non-hazardous waste. This process includes post treatment soil sampling to confirm the treatment effectiveness. Once this process is complete the treated soil will be loaded into trucks and hauled to a Class II non-hazardous regulated landfill. This treatment process is currently under evaluation.

For soil that has already been verified to be a Class II or Class III non-hazardous waste, it is the intention of the contractor to load the excavated soil generated during the construction activities directly into trucks for off-site disposal. If needed and requested by the regulated landfill, additional waste profiling of the Class II or Class III soil will be performed. The soil samples will be tested for analytes typically required by regulated landfills for soil coming from within the Mission Bay project area.

If soil stockpiling of suspected contaminated soil is to be performed, the excavation contractor shall establish appropriate soil stockpile locations on the site to properly segregate, cover, control dust, profile, and manage the excavated soil on-site. When stockpiled soil is not actively being handled, top sheeting will be placed over the stockpile and adequately secured so that all surface areas are covered.

Soil Disposition

The contractor will establish appropriate off-site soil disposal locations and direct truck loading scheduling and/or soil stockpile locations to properly segregate, cover, moisture control, and profile the excavated soil. The contractor, on behalf of the owner, will be responsible for tracking final soil disposition. Any excavated soil considered State of California or Federal Resource Conservation and Recovery Act (RCRA) hazardous waste will be tracked using the Uniform Hazardous Waste Manifest System (USEPA Form 8700-22), as applicable. Soil not considered hazardous waste will be tracked using non-hazardous bills of lading.

The contractor will be responsible for accurate completion of the hazardous waste manifests and non-hazardous bills of lading. Records of all wastes shipped off-Site will be maintained by the

contractor and will be made available for inspection on request by Langan. The final destination of wastes transported off-site will be documented in a Closure Report.

Soil Sampling

Typical soil profiling requirements for landfills are one four-point composite sample per 500 to 750 cubic yards to be disposed. The soil profiling analysis will generally follow the guidelines established by DTSC *Information Advisory Clean Imported Fill Material* as stated in the report.

If soil samples are required for analysis, the samples shall be collected using a hand tools and placed in liners or laboratory provided sample containers. The samples will be uniquely labeled, placed into an ice-chilled cooler until delivery under chain-of-custody protocol to a California-certified analytical laboratory. The soil samples collected from the stockpile shall be identified by using a progressive numbering sequence with the date of the sample collection and the location. All appropriate regulatory sampling methods, holding times, and detection limits shall be followed.

Odor Control

When needed, odor suppression measures will be implemented by the contractor to minimize odor during excavation activities. The means to be considered for minimization of odors during excavation activities includes, but are not limited to: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; (c) use of foams to cover exposed odorous soil and rock material; (d) use of chemical odorants in spray or misting systems; and, (e) use of staff to monitor odors in surrounding area.

Contingency Procedures

Hazardous materials including underground storage tanks, sumps and/or vaults, and soil with petroleum hydrocarbon odors and/or stains may be encountered during excavation activities. If unanticipated hazardous materials are encountered, the following procedures should be implemented:

- Stop work in the area where the suspect material was encountered and cover it with plastic sheets.
- Notify the site superintendent, the owner and Langan for inspection and appropriate action in the suspect area.
- Review the existing HASP and make revisions, if necessary; and have appropriately trained personnel to work with the affected materials, once directed by the contractor.

If an unexpected underground storage tank (UST) and/or associated product lines are found, arrange for a licensed tank removal contractor to properly remove and dispose of the UST. Proper permits and notifications should be in place prior to removing the UST. Impacted soil from a UST excavation will be placed onto plastic sheets and covered. Langan will complete soil sampling and analysis tasks for UST closure in accordance with San Francisco Fire Department (SFFD) and SFDPH.

- If soil staining is observed in the areas of Class I hazardous material or Class II non-hazardous material the soil can likely be off-hauled as Class I hazardous waste or Class II non-hazardous waste. If soil staining is observed in native material the affected material will be segregated, placed into a stockpile onto plastic sheets, and covered.
- If a sump and/or vaults are encountered during excavation activities, contact the owner and Langan for inspection and appropriate action. If no liquid, obvious staining or odors are observed, sump and/or vaults will likely be destroyed and disposed of. If liquid is present within the sump and/or vault and/or obvious staining and odors are observed, Langan will collect samples for analyses to determine how to properly dispose of the material.
- If stained soil or odors are observed, plastic sheeting will be placed over the affected area and the owner and Langan will be contacted for inspection and appropriate action. If the material is to be excavated, the material will be stockpiled onto plastic sheeting and covered with plastic sheeting. Soil samples will be collected and analyzed to determine proper disposal of the material.

Health and Safety Plan

The contractor will be responsible for establishing and maintaining proper health and safety (H&S) procedures to minimize worker and public exposure to site contaminants during construction. The potential health risk to on-site construction workers and the public will be minimized by developing and implementing a comprehensive HASP, which will be prepared by the contractor. All project personnel shall read and adhere to the procedures established in this HASP. A copy of this plan will be kept on site during field activities and will be reviewed and updated as necessary.

The HASP plan will describe the training requirements, i.e. trained in accordance with Section 1910.120 of 29 Code of Federal Regulations (HAZWOPER training), specific personal hygiene, and monitoring equipment that will be used during construction to protect construction workers and the general public from exposure to constituents in the soil.

A site health and safety officer (HASO) identified in the HASP will be on site at all times during excavation activities to ensure that all health and safety measures are maintained. The HASO will have authority to direct and stop (if necessary) all construction activities in order to ensure compliance with the HASP.

Dust Monitoring Control Plan (June 2015)

Real-time dust monitoring will generally be conducted during potential dust generating activities.

Dust Monitoring Equipment

The dust monitors used, such as the Thermo Electron Corporation MIE Model pDR-1200 or equivalent shall be capable of:

- Continuous, unattended, real-time monitoring, data-logging, and data transmission.
- Measurement of air-borne particulates 10 micrometers in size (PM-10) or less.
- Measurement of a 10-minute time-weighted average (TWA).
- A detection limit range of between 1 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and 400,000 $\mu\text{g}/\text{m}^3$.

Triggering visual and/or remote alarms. The visual alarm will consist of a flashing light, audible alarm, or similar, to alert on-site monitoring and/or contractor personnel a reading has been recorded above the action level. If dust monitoring personnel are not available to monitor dust onsite, a remote alarm will be used. The remote alarm will consist of a text message, email, phone message, or similar, to alert off-site monitoring personnel a reading has been recorded above the action level.

Baseline Dust Conditions

Prior to commencement of site work, a dust monitor will be set up at an upwind location to collect continuous dust monitoring data for a period of two days, for at least eight hours each day. The dust monitoring data collected during this interval will be used to establish baseline dust conditions.

Sampling Frequency

Except in the case of heavy fog or precipitation events, the dust monitors will be set up on a daily basis, for the first week of each new, potential dust-generating activity conducted (e.g., one week of dust monitoring during demolition, one week of dust monitoring at the beginning of excavation). The dust monitors will be set up by dust monitoring personnel at the start of each work-day prior to the start of the dust generating activity, and taken down at the conclusion of each work-day. Additionally, dust monitoring personnel will be present on-site to monitor field conditions and consult with contractor personnel on suitable dust suppression measures at:

- The start of each new dust-generating activity, and for one to two days thereafter depending on the observed site conditions.
- The day after a reading is collected that is above the daily average action level.
- The day of and/or the day after a reading is collected that is above the 10-minute TWA action level.
- The day of and/or the day after visual observation of fugitive dust crossing the project area boundary.
- The day of and/or the day after complaints about dust are received.

If a reading above any action levels is recorded during the initial week of dust monitoring, dust monitoring will be extended for an additional week. Dust monitoring will continue until the appropriate dust suppression measures have been established for the given activity and an entire work-week with no readings above the dust action levels has occurred.

Dust monitoring will not be conducted when there is fog or a precipitation event since (1) a nuisance dust condition is not anticipated in the case of heavy fog or precipitation and (2) dust

monitors are subject to damage or falsely elevated readings in the presence of excessive atmospheric moisture.

Sampling Locations

At a minimum, two dust monitors will be placed at the site perimeter. One dust monitor will be placed at an upwind location, and one dust monitor will be placed at a downwind location. Wind direction will be evaluated based on a wind sock or flag located at the site or per the nearest weather station (KCASANFR102 zip 94111) with live wind reporting. Weather forecasting and reporting can be found on a website such as <http://www.wunderground.com>. Dust monitor locations will be re-located throughout the day in the case of significant changes in the wind direction. The dust monitor locations will be recorded in dedicated field logs.

Action Levels and Corrective Actions

The California Air Resources Board (CARB) has developed an ambient air quality standard for PM-10 of $50 \mu\text{g}/\text{m}^3$ averaged over a 24 hour period (CARB, 2012). If the daily average from perimeter monitoring exceeds $50 \mu\text{g}/\text{m}^3$, or the baseline dust conditions, whichever is higher, additional dust control measures will be implemented. The daily average will be calculated over a 24 hour period based on (1) the continuous dust monitoring data collected over the course of the work day and (2) the previously established baseline dust concentrations, extrapolated over the remainder of the 24 hour period.

Visual and/or remote alarms on the perimeter dust monitors will be set to trigger if the PM-10 level exceeds $250 \mu\text{g}/\text{m}^3$ averaged over 10 minutes. If the visual and/or remote alarms are triggered, additional dust control measures will be implemented per Table 1 and Section 4.0 of the report.

Action Levels and Required Actions

Dust Condition	Required Actions
PM-10 concentration exceeds daily average of $50 \mu\text{g}/\text{m}^3$ or baseline dust conditions, whichever is higher	Review baseline dust conditions. Review work procedures. Implement additional dust control measures as needed to prevent future exceedances of the $50 \mu\text{g}/\text{m}^3$ daily average and/or minimize dust concentrations over the baseline dust conditions. Example additional dust control measures provided in Section 4.0 of the report.
PM-10 concentration exceeds 10-minute TWA of $250 \mu\text{g}/\text{m}^3$	Particulate monitor triggers an alarm. Temporarily stop work and apply more aggressive dust control measures, per Section 4.0 or similar, until the 10 minute average concentration drops below $250 \mu\text{g}/\text{m}^3$.
Visible fugitive dust migrating off-site	Temporarily stop work and apply more aggressive dust control measures, per Section 4.0 or similar, until there are no visible dust clouds migrating off-site.
Neighbor complaints	Implement more aggressive dust control measures, per Section 4.0 of the report or similar.

Fugitive Dust

Fugitive dust migration from the site will be visually assessed by dust monitoring personnel and/or contractor personnel. If, during the course of the work, fugitive dust is observed migrating from the site, additional dust control measures will be implemented per Table 1 and Section 4.0 of the report.

General Dust Control Methods

Based on the air monitoring results, visual observations of fugitive dust, and/or complaints of excessive dust generation by off-site parties, additional dust suppression measures may need to be implemented. Dust suppression measures could include, but are not limited to, the following:

- Wetting down soil improvement operations, visibly dry disturbed soil surface areas, and visibly dry disturbed unpaved driveways, parking areas, and staging areas to minimize or prevent dust from becoming airborne.
- If water is used as a primary form of dust control, applying it at least three times per day, per shift.
- Covering stockpiles of excavated materials, backfill material, import material, gravel, sand, road base, and soil with polyethylene plastic sheeting, tarp, or other equivalent cover.
- Terminating excavation, grading, and other construction activities when wind speeds exceed an average sustained speed of 25 miles per hour and causes uncontrolled visible dust emissions.
- Using dust enclosures, dust curtains, plastic tarps, windbreaks, and dust collectors as necessary to control dust.
- Utilizing alternate work methods.
- Implementing speed restrictions.
- Minimize drop heights while loading transportation vehicles.
- Use tarpaulins or other effective covers for trucks transporting soils.
- Wet sweeping or vacuuming paved streets, sidewalks, paths, and intersections where work is in progress.
- Sweeping the surrounding streets and sidewalks at least once per day during demolition, excavation, and construction so that dust is not allowed to leave the construction area.
- Installing wheel washers to clean all trucks and equipment leaving the site. In the case where wheel washers cannot be installed, brushing tires or tracks and spoil trucks off before they re-enter City streets to minimize deposition of dust-causing materials.

Record Keeping

Observations and monitoring results shall be recorded in dedicated field logs for each day dust monitoring is conducted. Information to be recorded in the dedicated field logs will, at a minimum, include:

- Dust monitoring personnel on-site, and location and type of dust monitoring equipment.
- Contractor personnel and equipment on-site.
- Weather conditions, including temperature, precipitation conditions, and wind direction and speed.
- Dust generating activities conducted.
- Dust suppression measures implemented.

- Daily average, minimum 10-minute TWA, and maximum 10-minute TWA.
- Exceedances of action levels or visible fugitive dust, if any, and additional dust suppression measures implemented.
- Conditions in which dust generating activities are conducted, but dust monitoring is not (i.e. equipment malfunction, heavy fog or precipitation, etc.).

Project Signage

Signage will be posted at the site that will include the appropriate contractor contact information (i.e., telephone number) for interested parties to contact in case of complaints, such as excessive dust generation. Signage will be posted at a location that is visible from the public right-of-way.

Weekly Reporting and Exceedance Notifications

A weekly summary report will be prepared and submitted to the SFDPH for each week that dust monitoring is conducted. At a minimum, the weekly summary report will include information on the dust generating activities, dust suppression measures implemented, dust monitoring activities, daily averages, minimum daily 10-minute TWAs, maximum daily 10-minute TWAs, and action level exceedances, if any.

Based upon the submitted documentation, the Site Mitigation Plan has been **approved** and the Dust Monitoring Plan has been received by EHB-SAM. Review of the information provided by the documents submitted to date, further documentation is warranted.

1. The SMP mentions that it is the intent of the contractor to use a portable treatment unit (i.e. pug mill or rototiller) to treat contaminated soil. These methods have not been officially decided upon as stated by the consultant. When the owner and the general contractor have decided which remediation method will be most effective for the construction schedule; the appropriate permits as necessary shall be provided to this Department.
2. Please submit a Dust Control Plan **addendum** to address the following. This information will be requested in all future projects across the City and County of San Francisco.

The goal of the Dust Control Plan is NO VISIBLE DUST. It is understood that soil disturbance and excavation activities produce dust, dust controls will be used to mitigate visible dust as it occurs. In the event that visible dust from soil disturbance or excavation is observed onsite, but does not cross the construction area boundary, the following procedures or comparable actions shall be followed. All activities listed herein, shall be addressed by the revised DMP.

- A. The DMP shall specify that when wind speeds gauge 20 miles per hour, whenever a ten minute time-weighted average equals or is exceeded; the Golden State Warriors and/or their representatives shall implement specified steps to abate blowing dust within 30 minutes total. If the abatement measures fail, that specific activity contributing to the dust generation shall cease. Work shall not commence, until the Golden State Warriors and/or their representatives can

demonstrate adequate dust control activities at the site is effective, due to changed conditions, or are no longer necessary.

- B. Please specify in detail what these abatement activities will entail. Every time wind speeds have been documented at 20 miles per hour, whenever a ten minute time-weighted average equals or is exceeded via wind monitoring, produce and specify in a log what activities were implemented to correct the problem(s). These logs may be requested in the future and should be made available to SFDPH upon request.
 - C. Please provide the wind speed data gathered by the on-site weather station presented as daily or half-day average wind speeds since the inception of weather data collection. The collection points shall be collected every 10 minutes, and set the audible signal to 20 mph, rather than 25 mph.
 - D. Site work shall cease and/or site activities shall prevent and remedy **any** dispersion of dust across the project boundary. Should dust suppression remedies fail or the project scope changes, the EHB-SAM may re-visit and change any DMP requirements at a later date.
 - E. Please provide actions to be taken, utilizing best management practices prior to winds increasing from 20 mph. Please indicate the person responsible to make this determination; and at what point will they make the decision to cease operations creating fugitive dust. How will this order be communicated and carried out? Please specify in detail.
 - F. A written description and reference table / chart format will be helpful when outlining the actions taken by the Golden State Warriors and/or their representatives, when implementing dust control activities for each of the 15, 20, 25 plus miles per hour wind speeds. Outline strategies to apply BMPs for the different wind speeds.
- 3. In addition, the active piles will be thoroughly wetted at the end of each weekday and excess material will be removed and/or consolidated regularly to limit the extent. The time schedule shall be adjusted when meteorological and / or site conditions warrant.
 - 4. Please include mitigation of dust control measures from construction traffic, paved and unpaved roads, parking lots and construction staging areas shall include a maximum vehicle speed limit of ~~ten~~ (10) miles per hour and include one or more of the following:
 - A. Watering every 2 hours and at a minimum 3 times per 8 hour shift during active operations or sufficiently often to keep the area adequately wetted. Watering may be increased during above average temperatures, when activities intensify or wind speeds.

- B. Applying chemical dust suppressants consistent with manufacturer's directions. Address reapplication for non-active stockpiles when needed.
 - C. Maintaining a gravel or asphalt cover with a silt content that is less than five (5) percent to a depth of three (3) inches on the surface being used for travel.
 - D. Paved roads within a construction site will be swept twice daily with a wet sweeper during dust-generating activities.
 - E. At least the first 500 feet of any public roadway exiting from the construction site will be at a minimum swept twice daily during dust generating activities.
 - F. Implementation of erosion control BMPs will control dust emissions from public roadways, parking areas and any above grade unpaved staging areas or roadways.
 - G. Construction employees will park in paved or graveled laydown areas, to reduce dust emissions.
 - H. To the extent possible, heavy equipment will be left on the construction site and not staged outside the construction site to minimize potential for track out.
 - I. Reduced vehicle trips through efficient truck and equipment usage by minimizing equipment mobilization and demobilization and using full truck loads, etc.
 - J. Utilize a rumble strip at all exits around the project area.
 - K. Additional watering schedule will be added for weekends and end of workdays, should dust issues and complaints arise.
 - L. To reduce dust, dirt or concrete fines from causing eye injuries during high winds, ensure that employees and onsite visitors have proper eye protection and access to an eye wash station. The Cal/OSHA requirements for personal protection and safety should be established throughout the site, if not already in place.
 - M. Please provide actions to be taken, utilizing best management practices prior to winds increasing to 20 mph. The San Francisco Health Code, Article 22B, Section 1242 (c)(16) specifies that termination of excavation, grading, and other construction activities may be initiated when wind speeds exceed 25 miles per hour.
 - N. Some of these requirements may have already been addressed in the DMP dated June 3, 2015.
5. Onsite signage shall be in English, Spanish and the predominate language of persons used in the area. The signage shall include pertinent contact information of the project proponents and be clearly seen at a distance of 25 feet.

6. Please include site maps and photographs to illustrate site activities that may generate dust. Please reference project number **SMED 1154** for all submitted documentation.
7. Please refer to the San Francisco Health Code, Article 22B, Section 1242 (c)(11) & (14) outlining use of reclaimed water where practicable.
8. Ensure that all other Federal, State and local statutes, codes, regulations or ordinances are followed when applicable.
9. Please submit a Final Report at completion of the project.
10. Ensure that all Maher fees and invoices are paid and up to date, otherwise the final No Further Action letter will not be issued.
11. Please submit all documents as a .pdf and open word document on a CD, otherwise your information will be returned to you.

Should you have any questions please contact Martita Lee M Weden, Sr. Environmental Health Inspector at (415) 252-3938 / martita.lee.m.weden@sfdph.org or Stephanie Cushing, Principal Environmental Health Inspector at (415) 252-3926 / stephanie.cushing@sfdph.org.

Sincerely,



Martita Lee M Weden, MS, CA USTI
Senior Environmental Health Inspector



Stephanie K.J. Cushing, MSPH, CHMM, REHS
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City and County of San Francisco
DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH

Edwin M. Lee, Mayor
Barbara A. Garcia, MPA, Director of Health
Richard J. Lee, MPH, CIH, REHS
Acting Environmental Health Director

September 15, 2015

Steve Collins
Golden State Warriors Arena
1011 Broadway
Oakland, CA 94607
Scollins@warriors.com

**Subject: DUST MONITORING PLAN CONDITIONAL APPROVAL
GOLDEN STATE WARRIORS ARENA
BLOCKS 29 - 32, SAN FRANCISCO, CA 94158
EHB-SAM No.: SMED 1154**

Dear Mr. Collins:

In accordance with the San Francisco Health Code, Article 22A and the Building Code, Section 106.3.2.4 – Hazardous Substances; the San Francisco Department of Public Health, Environmental Health Branch, Site Assessment and Mitigation (EHB-SAM) has reviewed the following documents:

- Phase 2 Environmental Site Assessment, Golden State Warriors Arena, Blocks 29 Through 32 - Mission Bay, San Francisco CA, prepared by Langan Treadwell Rollo, June 2015
- Site Mitigation Plan, Golden State Warriors Arena, Blocks 29 Through 32 - Mission Bay, San Francisco CA, prepared by Langan Treadwell Rollo, June 2015
- Dust Monitoring Plan, Golden State Warriors Arena, Blocks 29 Through 32 - Mission Bay, San Francisco CA, prepared by Langan Treadwell Rollo, June 3, 2015
- Email RE: Potholing along 3rd Street, prepared by Dustyne Sutherland of Langan Treadwell Rollo, June 9, 2015
- Email RE: Potholing along 3rd Street with a Temporary Stockpile of Less Than 50 yd³, prepared by Adam Brown of Langan Treadwell Rollo, June 17, 2015
- Revised Dust Monitoring Plan, Golden State Warriors Arena, Blocks 29 Through 32, Mission Bay, San Francisco, CA, prepared by Langan Treadwell Rollo, July 21, 2015

Site Description and Proposed Project

The site is located within an area bound by Third Street on the west, South Street on the north, Terry A. Francois Boulevard on the east and 16th Street on the south, as shown on Figure 1 of

the report. The project area has approximate plan dimensions of 760 by 620 feet and encompasses approximately 10.9 acres.

The proposed development will consist of three main areas. Additionally, Terry A. Francois Boulevard will be re-aligned to run north to south on the east side of Blocks 30 and 32, in accordance with the Mission Bay master infrastructure plan following arena construction; note that the realignment of Terry A. Francois Boulevard is not addressed in the report.

- Arena – The arena structure will be approximately eight stories high. The arena has a total planned excavation depth of 12 feet bgs.
- Parking and Plaza – The parking and plaza will consist of parking, restaurants, retail and office buildings up to 11 stories high. The parking and plaza areas have a total planned excavation depth of 24.5 feet bgs. Some portions of the plaza area will not include subgrade parking and have a total excavation depth to approximately 14 feet bgs.
- Practice Courts – The practice court has a total planned excavation depth of 18.5 feet bgs.
- Conduct pothole activity along the sidewalk parallel to 3rd street, South Street, and 16th Street. The total amount of material disturbed will be limited to less than 50 yd³. The goal of this task is to look for an existing joint utility trench which if present will impact the current design of the parking structure. Potholes will be excavated and material will be stockpiled onsite per the requirements in the SMP. Each pothole will be securely covered after excavation and will be backfilled with the removed stockpiled material once the survey of the joint trench is complete. The contractors propose that the material be stockpiled for the duration of the pothole survey, which is approximately 1 week. The excavated material would then be used to backfill the pothole locations. Stockpiling of material would only be temporary. The contractor and subcontractor will follow the SMP for proper soil handling procedures and will implement proper dust control as outlined in an approved DMP.

The property is identified as San Francisco County Assessor's Parcel Number: Block 8722, Lot 001.

Historical Site Usage

Originally, the site was below water in a shallow bay known as Mission Bay. The tip of historic Point San Quentin was located just south of the site, along the 1852 San Francisco shoreline. Starting in the late 1860s, Mission Bay was reclaimed by placing fill. A review of historic maps and documents indicates that the site was reclaimed starting around 1869 with soil and rock from nearby Irish Hill and the Second Street cut. Filling of the site was completed between 1906 and 1910 with fill and building rubble from the 1906 San Francisco earthquake. In addition, a structure named Long Bridge was constructed along what is now 3rd Street; this structure was a timber pile-supported bridge that crossed Mission Bay from north to south.

The 10.9 acre site is vacant with paved parking areas (portions of Blocks 29 through 31) and an unpaved vacant lot (Block 32). With the exception of an area in the southern portion of the site, the ground surface is relatively flat, with elevations ranging from about 99 to 103 feet. There is a depressed area in the southern portion where an excavation was performed for an environmental cleanup and partially backfilled.

The site is located at the Pier 64 area of Mission Bay, historically used for a variety of industrial purposes primarily related to bulk oil storage and transfer operations. Former operations included the following:

- Bulk fuel storage and distribution (approximately 1902 to 1966).
- Railroad operations (approximately 1904 to 1939).
- A machine shop (approximately 1904 to 1927).
- A boiler house (approximately 1904 to 1927).
- Steel mill (approximately 1906 to 1928).
- Well casing manufacturer (1907 to 1975).
- Warehousing, shipping, and receiving operations for a variety of products including agricultural chemicals, lumber, food, automobiles, metals, etc. (approximately 1910 to 2006).
- A fruit cannery (approximately 1935 to 1961).
- Junk yards, vehicle parking, and vehicle maintenance facilities (approximately 1950 to 2004).
- Ready-mix concrete facilities (approximately 1972 to 2010).

Subsurface Conditions

Langan and others have completed previous geotechnical and environmental investigations at the site. A profile location map showing historical boring locations and two idealized subsurface profiles (Appendix A, Figures A-1 through A-3) illustrate the general subsurface conditions, consisting of fill, Bay Mud, Colma Formation sand, sand layers, Old Bay Clay, and bedrock (Langan, 2011). Boring logs from the December 2014 and January 2015 investigation are presented in Appendix A. Where explored, the site is blanketed by approximately 7 to 25 feet of fill overlying Bay Mud. The fill consists of gravel, sand, and clay mixtures, with brick, rock (including serpentinite), and other rubble. The sand and gravel are loose to very dense, and the clay is soft to stiff. The fill likely also includes cobble- and boulder-sized pieces of serpentinite and other materials that were apparent from the drilling but could not be recovered from the samplers. The Bay Mud is a weak and compressible marine clay deposit. This layer ranges from about 2.5 to 46.5 feet thick, generally becoming thicker to the north. Based on the physical setting of Mission Bay, the elevation of the Bay Mud varies across the site, hence the fill thickness also varies.

A medium dense to very dense clayey sand, silty sand and sand with clay and stiff to hard sandy clay, clay with sand and clay was encountered below the Bay Mud. Where encountered the sand and clay layers total 3 to 31 feet thick. A medium dense to very dense sand, sand with clay, clayey sand, silty sand and sand with silt, known as the Colma Formation, was encountered below the sand and clay in portions of the site. The top of the Colma formation was encountered

about 19 to 70 feet bgs. Where encountered, the sand is approximately 5 to 35 feet thick. The Colma Formation generally becomes thicker to the north and west.

A stiff to hard clay known as Old Bay Clay, very stiff to hard sandy clay, clay, gravelly clay with sand and clay with gravel and dense to very dense sand with silt and clayey sand were encountered below the Colma Formation to bedrock. Bedrock was encountered at depths ranging from 32 to 130 feet. Bedrock generally becomes deeper to the northwest and consists of serpentinite, greenstone, shale, and claystone of the Franciscan Complex. The rock is crushed to intensely fractured, soft to moderate hardness, and friable to weak, with deep to moderate weathering.

As part of data collection for construction dewatering and structural design efforts, three piezometers (PZ-01 through PZ-03) were installed on 18 September 2014 by Langan. Groundwater has been measured in PZ-01, PZ-02, and PZ-03 on site at approximately 6.5 to 12 feet bgs. In PZ-01, depth to groundwater has been influenced by a periodic dewatering system located to the south and adjacent to the Site at 16th and Terry A. Francois Boulevard. Local groundwater flow patterns vary in this area due to the heterogeneous nature of the fill and tidal fluctuations, but the overall direction of shallow groundwater flow at the site is generally southeast toward San Francisco Bay.

Previous Investigations and Remedial Actions

Past activities within the Pier 64 area, specifically at the former petroleum terminals and related pipelines, significantly impacted environmental conditions at the site. On 15 June 2005, the Water Board adopted Order No. R2-2005-0028, which set forth the final cleanup requirements and redefined the Pier 64 area into six OUs. Portions of the site within the North Terminal OU include the southeastern portion of Block 29, southern portion of Block 30, eastern half of Block 31, and entirety of Block 32. Responsible parties for the investigation and cleanup of the Pier 64 area, including North Terminal OU, are ARCO, Chevron, Phillips, UNOCAL, and Texaco (collectively referred to as the "Pier 64 Group" - primary dischargers) and the City and County of San Francisco and Esprit (secondary dischargers).

One 13,500-gallon diesel underground storage tank (UST), formerly operated by the Pacific Coast Bus/Franciscan Bus Line, was removed from Block 31 in 1987, and one 1,000-gallon gasoline UST, formerly operated by Filbert Warehouse Corporation, was removed from Block 32 in 1997. These USTs were located within the area of the separate phase hydrocarbons (SPH) plume in the North Terminal OU. Free product was present near the water table during removal of both USTs.

One 4,000-gallon diesel UST, one 10,000-gallon UST, and one 5,000-gallon gasoline UST were formerly located at the portions of Blocks 29 and 31. The USTs were permanently removed in 1995, followed by sampling and removal actions for localized soil and groundwater impacts. Tank closures were conducted under the authority of the SFDPH Local Oversight Program (LOP) and the Water Board. The LOP and Water Board issued case closure for these USTs in February 1995.

Mission Bay Subsurface Investigations in 1997 and 1998

Environ conducted several subsurface investigations in Mission Bay Blocks 29 through 32 in 1997 and 1998. Total petroleum hydrocarbons as diesel (TPHd) and TPH as motor oil (TPHmo) were detected in soil and groundwater, in areas of former bulk petroleum storage, pipelines and transfer facilities. A measureable amount of SPH was observed at the groundwater table in two areas within Blocks 29 and 32. Metals were detected in soil at concentrations typically associated with Mission Bay fill materials. Asbestos was detected in soil and was attributed to the likely presence of Serpentinite bedrock, a common constituent in Mission Bay fill material. The SPH areas of impact were subsequently remediated as discussed below.

Phase I Remedial Excavation in 2001

The Phase I remedial action was implemented by Clayton in 2001. Approximately 14,020 tons of visibly stained soil was excavated to a depth of 2 feet below the groundwater surface (to approximately 9 feet bgs). SPH was removed from the exposed groundwater surface within the excavation and an SPH collection trench and high-density polyethylene (HDPE) sheeting was installed along the western edge of the excavation to minimize the lateral migration of floating SPH. Soil containing residual oil below the target zone was left in place.

Phase II Remedial Excavation in 2005

A Phase II remedial action was completed within the Pier 64, including portions of the site, in 2005 through 2006. On-site activities included demolition and disposal of above ground structures, excavation and stockpiling of overburden soils, excavation of 90,000 tons of SPH impacted soils to a depth of approximately 2 feet below the ground water level (to approximately 9 feet bgs), dewatering, removal of SPH from the exposed groundwater surface, and backfilling the excavation. The excavation was backfilled using crushed concrete from on-site demolition activities and overburden from the respective operable units that met the Mission Bay RMP reuse criteria. On 22 December 2006, the Water Board issued a no further action letter to the Pier 64 Group for soil remediation activities within the Pier 64 OUs, including portions of the site.

Groundwater Monitoring

The Water Board required the Pier 64 Group to develop and implement a Groundwater Monitoring Program (GMP) to continue to assess groundwater quality. The GMP comprised approximately 20 active monitoring wells for the Pier 64 area. The Water Board approved ARCADIS' site closure request on 31 May 2013. Based on post-remediation groundwater monitoring results, the Water Board rescinded Order R2-2005-0028 and approved destruction of all on site monitoring wells. In June 2013, ARCADIS abandoned 20 monitoring wells at the Pier 64 area (ARCADIS, 2013).

Strata Phase I Environmental Site Assessment (ESA), September 2010

The significant findings identified in Strata's Phase I ESA report are related to the historic fill materials underlying the site and the past industrial site activities including oil bulk storage and transfer operations, railroad operations, warehousing, and vehicle maintenance operations. However, extensive soil and groundwater remediation activities have taken place at the site and the remaining environmental conditions can be effectively managed by the Mission Bay RMP.

Langan Phase I ESA Update, April 2010

Langan completed a Phase I ESA update on behalf of Strada in April 2014. Based on the review of regulatory files, the site history, and site reconnaissance, this assessment revealed no substantial changes, or additional recognized environmental concerns (RECs) at the site since the September 2010 Phase I ESA report was completed.

Phase 2 Subsurface Investigation (December 2014)

The initial phase investigation was completed in December 2014. The initial sampling also included the collection of groundwater samples from the three existing piezometers (PZ-1, PZ-2 and PZ-3).

In January 2015, the second step-out phase was conducted to further characterize hazardous waste types proposed for excavation and to facilitate off-site disposal and/or on-site treatment prior to off-site disposal. Additional borings and samples were collected near the initial phase borings at depths where chromium, lead, and nickel were present at levels that exceeded hazardous waste criteria. To assist with the dewatering and to evaluate if groundwater pretreatment will be required prior to discharge to the sanitary sewer and to confirm detections reported in December, PZ-01, P-02 and PZ-03 were sampled in March 2015 for pH, chloride and nickel.

As discussed on 14 November 2014 during a meeting with SFDPH regarding the draft Work Plan and based on the design plans that the structural slabs will be below the groundwater table, soil gas samples were not collected because methane vapor intrusion would not be a concern. The groundwater volatile organic compound (VOC) and total petroleum hydrocarbons as gasoline (TPH_g) sampling results conducted as part of the initial investigation phase were compared to Water Board vapor intrusion Environmental Screening Levels.

On 22 and 23 December 2014, Gregg Drilling & Testing, Inc. (Gregg) of Martinez California, a C-57 licensed drilling company, advanced 15 borings using a combination direct push/hollow stem auger drill rig for the collection of soil samples within the three proposed areas of development (Arena, Parking and Plaza, and Practice Facility). On 10 December 2014, groundwater samples were collected from the three piezometers (PZ-1, PZ-2 and PZ-3). The sample locations and boring depths are shown on Figure 3 of the report.

Arena – Six borings (LB-6 through LB-9, LB-11 and LB-12) were drilled between 13 feet bgs and 22 feet bgs. Approximately four to six soil samples were collected from each boring at 2.5 to 5 foot intervals.

Parking and Plaza – Eight borings (LB-1 through LB-5, LB-10, LB-13 and LB-15) were drilled between approximately 12 feet bgs and 33 feet bgs. Approximately four to ten samples were collected from each boring at 2.5 to 5 foot intervals. Two groundwater grab samples were collected from the existing temporary piezometers PZ-1 and PZ-2.

Practice Facility - One boring (LB-14) was drilled to approximately 25 feet bgs. Approximately nine soil samples were collected from the boring at 2.5 to 5 foot intervals. One groundwater grab sample was collected from existing temporary piezometer PZ-3.

Soil Sampling

Soil samples were collected using dual-tube direct push drilling technology. Continuous soil cores were collected inside a sample barrel, lined with 5-foot-long clear acetate sample liners. The soil cores were visually logged by Langan's SBE subconsultant Albion Partners personnel in general accordance with the Unified Soil Classification System (USCS), using ASTM D-2488-09a, visual/manual procedure, working under the supervision of a Langan California professional geologist. Soil was screened for organic vapors using a calibrated photoionization detector (PID).

The selected soil sampling interval was cut from the acetate sample liner. The ends of each sample liner were covered with Teflon sheets, capped at each end, appropriately labeled, and placed in an ice filled chest cooled to 4°. The samples were submitted under chain-of-custody protocol to Curtis & Tompkins Laboratories (C&T) of Berkeley, California, a State of California certified laboratory. After the final sample was collected at each boring location, each soil boring was backfilled with neat cement grout delivered via a tremie pipe, under the oversight of an SFDPH inspector.

Soil samples were analyzed for some or all of the compounds listed below based on Table 1 of the Work Plan, visual observations, and PID readings:

- TPHg, TPH as diesel (TPHd), and TPH as motor oil (TPHmo) by Modified Environmental Protection Agency (EPA) Method 8015B;
- VOCs by EPA Method 8260B;
- Semi-volatile organic compounds (SVOCs) by EPA Method 8270C;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082;
- California assessment manual (CAM) 17 metals by EPA Method 6010 and EPA Method 7471A;
- Leaking Underground Fuel Tank (LUFT) 5 Metals (6010B);
- Total lead by EPA Method 6010;
- Asbestos by California Air Resources Board (CARB 435);
- pH by EPA Method 9045D;
- Cyanide by Standard Method SM4500CN-E.

If metal concentrations exceeded the Total Threshold Limit Concentrations (TTLC) or if total metal concentrations exceeded the soluble threshold limit concentration (STLC) by 10 times, soil samples were analyzed by the California Waste Extraction (WET) Method to evaluate if the results exceed the State of California Class I hazardous waste criteria. If a soluble metal result exceeded the STLC, the sample was analyzed by Toxicity Characteristic Leaching Procedure (TCLP), to evaluate if the concentration exceeds the Resource Conservation and Recovery Act (RCRA) or federal hazardous waste criteria.

Groundwater Sampling

In December 2014, three on site piezometers (PZ-1 through PZ-3) were sampled to facilitate obtaining a batch waste water discharge permit for disposal of groundwater pumped during construction and to satisfy the Maher Ordinance requirements. Groundwater samples were collected in accordance with the low flow groundwater sampling procedures as outlined in the Work Plan. Groundwater samples were collected directly into laboratory-supplied and preserved sample containers, appropriately labeled, and stored in an ice-cooled chest until delivery to C&T.

Groundwater samples collected from piezometers PZ-1 through PZ-3 were analyzed for some or all of the compounds listed below:

- TPHd, and TPHmo by EPA Method 8015B following silica gel preparation by EPA Method 3630C;
- TPHg by EPA Method 8015B;
- VOCs by EPA Method 8260B;
- SVOCs by EPA Method 8270C SIM;
- CAM 17 Metals by EPA Method 6020 and EPA Method 7470A;
- LUFT 5 Metals by EPA Method 6010B;
- pH by EPA Method 9040C;
- Cyanide by Standard Method SM4500CN-E;
- Dissolved Sulfides by Standard Method SM4500S2-D;
- Total Suspended Solids by Standard Method SM5220D;
- Chemical Oxygen Demand by Standard Method SM5220D;
- Phenols by EPA Method 420.1; and
- Flashpoint by ASTM D-93.

January 2015 Field Investigation

From January 26 - 28, 2015, Gregg of Martinez California, a C-57 licensed drilling company, advanced 15 additional step-out borings using a combination direct push/hollow stem auger drill rig to facilitate the collection of soil samples. The purpose of the step-out boring program was to further profile the anticipated waste types identified in the December 2014 initial investigation and to delineate the top and thickness of the Bay Mud lithologic unit.

- Arena – Seven borings (LB-19 through LB-21, and LB-26 through LB-28 and LB-31) were drilled to total depths of between 15.5 feet bgs to 17 feet bgs. Two to five soil samples were collected from each boring.
- Parking and Plaza – Nine borings (LB-16 through LB-18 and LB-22 through LB-25 and LB-29 through 30) were drilled to total depths of between approximately 12 feet and 30 feet bgs. One to four samples were collected from each boring.
- Practice Facility - Two borings (LB-32 and LB-33) were drilled to a total depth of approximately 22 feet bgs. One soil sample was collected from each boring location.

March 2015 Groundwater Sampling

In March 2015, to assist with the evaluation of construction dewatering options and groundwater pre-treatment prior to discharge, piezometers PZ-1 through PZ-3 were sampled for ph, chloride and total nickel using the same methods discussed above in Section 5.2.2.

Analytical Results

Non Metal Compounds

TPHg was present above the laboratory reporting limit in 5 of the 44 samples analyzed at concentrations ranging from 1.5 milligrams per kilogram (mg/kg) to 9.9 mg/kg. TPHd was present above the laboratory reporting limit in 41 of the 44 samples analyzed at concentrations ranging from 1.0 mg/kg to 1,300 mg/kg. TPHmo was present above the laboratory reporting limit in 35 of the 44 samples analyzed at concentrations ranging from 8.2 mg/kg to 1,800 mg/kg.

- 1,2,4-Trimethylbenzene was detected in 1 of 28 samples analyzed at a concentration of 0.0078 mg/kg;
- Acetone was detected in 11 of 28 samples analyzed at concentrations ranging from 0.019 to 0.17 mg/kg;
- Carbon disulfide was detected in 2 of 28 samples analyzed at concentrations ranging from 0.0079 to 0.0083 mg/kg;
- Ethylbenzene was detected in 1 of 28 samples analyzed at a concentration of 0.007 mg/kg;
- 2-Butanone was detected in 1 of 28 samples analyzed at a concentration of 0.032 mg/kg;
- o-xylene was detected in 1 of 28 samples analyzed at a concentration of 0.0068 mg/kg;
- m, p- xylenes was detected in 1 of 28 samples analyzed at a concentration of 0.011mg/kg.
- All other VOCs were not present above laboratory detection limits.

The following SVOCs were present above laboratory detection limits:

- Acenaphthene was detected in 1 of 29 samples analyzed at a concentration of 0.028 mg/kg;
- Acenaphthylene was detected in 5 of 29 samples analyzed at concentrations ranging from 0.011 mg/kg to 0.18 mg/kg;
- Anthracene was detected in 10 of 29 samples analyzed at concentrations of 0.012mg/kg to 0.14 mg/kg;
- Benzo(a)anthracene was detected in 12 of 29 samples analyzed at concentrations of 0.0058 mg/kg to 0.53 mg/kg;
- Benzo(a)pyrene was detected in 15 of 29 samples analyzed at concentrations of 0.005 mg/kg to 2.1 mg/kg;
- Benzo(b)fluoranthene was detected in 17 of 29 samples analyzed at concentrations of 0.0071 mg/kg to 1.9 mg/kg;
- Benzo(g,h,i)perylene was detected in 12 of 29 samples analyzed at concentrations of 0.0074 mg/kg to 1.8 mg/kg;
- Benzo(k)fluoranthene was detected in 9 of 29 samples analyzed at concentrations of 0.018 mg/kg to 0.42 mg/kg;

- Chrysene was detected in 15 of 29 samples analyzed at concentrations of 0.0069 mg/kg to 0.71 mg/kg;
- Dibenz(a,h)anthracene was detected in 5 of 29 samples analyzed at concentrations of 0.019 mg/kg to 0.53 mg/kg;
- Fluoranthene was detected in 16 of 29 samples analyzed at concentrations of 0.0087 mg/kg to 0.72 mg/kg;
- Fluorene was detected in 6 of 29 samples analyzed at concentrations of 0.012 mg/kg to 0.085 mg/kg;
- Indeno(1,2,3-c,d)pyrene was detected in 10 of 29 samples analyzed at concentrations of 0.0054 mg/kg to 1.7 mg/kg;
- Naphthalene was detected in 5 of 29 samples analyzed at concentrations of 0.0098 mg/kg to 0.74 mg/kg;
- Phenanthrene was detected in 17 of 29 samples analyzed at concentrations of 0.0078 mg/kg to 0.39 mg/kg; and
- Pyrene was detected in 17 of 29 samples analyzed at concentrations of 0.0074 mg/kg to 0.9 mg/kg.

All other SVOCs were not detected above laboratory reporting limits.

The PCB Aroclor 1254 was detected in 1 of 7 samples analyzed at a concentration of 0.016 mg/kg. All other PCBs were not present above laboratory detection limits. Cyanide and sulfide were not detected above laboratory limits in any of the samples analyzed.

Metals

- Antimony was detected in seven out of 17 samples analyzed at concentrations ranging from 0.28 mg/kg to 5 mg/kg
- Arsenic was detected in 15 out of 17 samples analyzed at concentrations ranging from 0.3 mg/kg to 13 mg/kg
- Barium was detected in 17 out of 17 samples analyzed at concentrations ranging from 3.9 mg/kg to 360 mg/kg
- Beryllium was detected in 11 out of 17 samples analyzed at concentrations ranging from 0.26 mg/kg to 0.45 mg/kg;
- Cadmium was detected in 31 out of 44 samples analyzed at concentrations ranging from 0.31 mg/kg to 1.7 mg/kg
- Cobalt was detected in 17 out of 17 samples analyzed at concentrations ranging from 3.9 mg/kg to 93 mg/kg
- Copper was detected in 17 out of 17 samples analyzed at concentrations ranging from 5.6 mg/kg to 110 mg/kg
- Mercury was detected in 12 out of 17 samples analyzed at concentrations ranging from 0.033 mg/kg to 0.58 mg/kg
- Molybdenum was detected in 9 out of 17 samples analyzed at concentrations ranging from 0.45 mg/kg to 6.7 mg/kg
- Silver was detected in 3 out of 17 samples analyzed at concentrations ranging from 0.31 mg/kg to 0.99 mg/kg
- Vanadium was detected in 17 out of 17 samples analyzed at concentrations ranging from 17 mg/kg to 50 mg/kg

- Zinc was detected in 44 out of 44 samples analyzed at concentrations ranging from 15mg/kg to 420 mg/kg.

Selenium and thallium were not detected above laboratory reporting limits. The detected metal concentrations discussed above were within normal background ranges found in northern California soils as stated by the consultant.

Total chromium was detected in 59 out of 59 samples analyzed at concentrations ranging from 27 mg/kg to 1,800 mg/kg. Forty two soil samples were analyzed for soluble chromium using the STLC by WET method. Soluble chromium was detected in 36 out of 42 samples analyzed at concentrations ranging between 0.25 milligrams per liter (mg/L) and 16 mg/L. Of the samples analyzed eight failed the California Hazardous Waste Criteria of 5 mg/L. Twenty two soil samples were analyzed for soluble chromium using the TCLP method. TCLP chromium was detected in four of the 22 samples analyzed at concentrations ranging from 0.051 mg/L to 0.12 mg/L. Of the samples analyzed by the TCLP method, none were above the Federal Hazardous Waste Criteria of 5 mg/L.

Total lead was detected in 107 out of 114 samples analyzed at concentrations ranging from 0.29 mg/kg to 1,500 mg/kg. Fifty eight soil samples were analyzed for soluble lead using the WET method Soluble lead was detected in 56 out of the 58 samples analyzed at concentrations ranging between 0.51 mg/L and 77 mg/L. Of the samples analyzed for soluble lead, 30 results the STLC of 5 mg/L. Thirty seven soil samples were analyzed for soluble lead using the TCLP method. Soluble was detected in 29 of the 37 samples analyzed at concentrations ranging from 0.063 mg/L to 3 mg/L. Of the samples analyzed by the TCLP method, none were detected above the 5 mg/L Federal hazardous waste criteria.

Total nickel was detected in 62 out of 62 samples analyzed at concentrations ranging from 16 mg/kg to 2,400 mg/kg. Twenty two soil samples were analyzed for soluble nickel using the WET method. Soluble nickel was detected in 21 out of 22 samples analyzed at concentrations ranging between 0.7 mg/L and 86 mg/L. Of the samples analyzed for soluble nickel, seven exceeded the STLC of 20 mg/L. There is no TCLP established for nickel.

Groundwater Results

In the groundwater samples collected from PZ-1, PZ-2 and PZ-3, the following compounds were detected:

- Benzene was detected in PZ-1 at a concentration of 4.4 micrograms per liter (µg/L). No other VOCs were detected above laboratory reporting limits.
- Naphthalene was detected in PZ-1 at a concentration of 2.8 µg/L. No other SVOCs were detected above laboratory reporting limits.
- Chemical oxygen demand was detected in PZ-1 and PZ-2 at a concentration of 480,000 µg/L and 1,100,000 µg/L, respectively.
- Chlorides were detected in PZ-1, PZ-2 and PZ-3 at concentrations of 7,200 µg/L, 1,600 µg/L and 15,000 µg/L, respectively.
- Cyanide was detected in PZ-1 at a concentration of 10 µg/L.

- TPHg and TPHd were detected in PZ-1 at concentrations of 140 and 440 µg/L, respectively. TPHmo was not detected above the laboratory reporting limit.
- Total recoverable phenolics were detected in PZ-1 at a concentration of 330 µg/L.
- Sulfide was detected in PZ-1 at a concentration of 530 µg/L.
- Total suspended solids were detected in PZ-1 and PZ-2 at concentrations of 17,000 and 8,000 µg/L, respectively.
- The flashpoint of the water in PZ-1 and PZ-2 was 150 degrees Fahrenheit.
- pH ranged from a high of 11.8 in PZ-1 in December 2014 to a low of 7.1 in PZ-1 in March 2015.

Total Metals

In the groundwater samples collected from PZ-1, PZ-2 and PZ-3, the following total metals were detected:

- Antimony was detected in 1 out of 2 samples analyzed at a concentration of 1.3 µg/L.
- Arsenic was detected in 2 out of 2 samples analyzed at concentrations ranging from 2.2 µg/L to 8.1 µg/L.
- Barium was detected in 2 out of 2 samples analyzed at concentrations ranging from 68 µg/L to 1,600 µg/L.
- Beryllium was not detected in the samples collected from PZ-1 and PZ-3.
- Cadmium was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Chromium was detected in 1 of 3 samples analyzed at a concentration of 1.1 µg/L.
- Cobalt was detected in 1 out of 2 samples analyzed at a concentration of 1 µg/L.
- Copper was detected in 1 out of 2 samples analyzed at a concentration of 1.5 µg/L.
- Lead was detected in 1 of 3 samples analyzed at a concentration of 2.2 µg/L.
- Mercury was not detected in the samples collected from PZ-1 and PZ-3.
- Molybdenum was detected in 2 out of 2 samples analyzed at concentrations ranging from 6.6 µg/L to 39 µg/L.
- Nickel was detected in 6 out of 6 samples at concentrations ranging from 20 µg/L to 510 µg/L.
- Selenium was detected in 1 out of 2 samples analyzed at a concentration of 1.7 µg/L.
- Silver was not detected in the samples collected from PZ-1 and PZ-3.
- Thallium was not detected in the samples collected from PZ-1 and PZ-3.
- Vanadium was detected in 1 out of 2 samples analyzed at a concentration of 7.7 µg/L.
- Zinc was detected in 1 out of 3 samples analyzed at a concentration of 6.3 µg/L.
- 4.2.2.3 Dissolved Metals

- In the groundwater samples collected from PZ-1, PZ-2 and PZ-3, the following dissolved metals were detected:
 - Antimony was not detected in the samples collected from PZ-1 and PZ-3.
 - Arsenic was detected in 2 out of 2 samples analyzed at concentrations ranging from 1.8 µg/L to 7.6 µg/L.
 - Barium was detected in 2 out of 2 samples analyzed at concentrations ranging from 58 µg/L to 1,500 µg/L.
 - Beryllium was not detected in the samples collected from PZ-1 and PZ-3.
 - Cadmium was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.

- Chromium was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Cobalt was not detected in the samples collected from PZ-1 and PZ-3.
- Copper was detected in 1 out of 2 samples analyzed at a concentration of 1.2 µg/L.
- Lead was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Mercury was detected in 1 out of 2 samples analyzed at a concentration of 0.77 µg/L.
- Molybdenum was detected in 2 out of 2 samples analyzed at concentrations ranging from 5.5 µg/L to 38 µg/L.
- Nickel was detected in 3 of 3 samples at concentrations ranging from 18 µg/L to 510 µg/L.
- Selenium was detected in 1 out of 2 samples analyzed at a concentration of 1.9 µg/L.
- Silver was not detected in the samples collected from PZ-1 and PZ-3.
- Thallium was not detected in the samples collected from PZ-1 and PZ-3.
- Vanadium was detected in 1 out of 2 samples analyzed at a concentration of 6.3 µg/L.
- Zinc was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.

Conclusions and Recommendations by the Consultant

The fill unit was characterized as either a State of California Class I hazardous material based on soluble chromium, lead, and nickel concentrations or a Class II non-hazardous material, likely related to debris from the 1906 earthquake and resulting fire. Generally, the Class I California hazardous material extends from the surface to 24.5 feet bgs (the deepest layer is observed in the northeast corner of site adjacent to Terry Francois Boulevard). The areas of fill material containing soluble chromium, lead, and nickel concentrations exceeding the State of California hazardous waste criteria will be disposed of off-site at a Class-I non-RCRA regulated landfill. The current developer is also exploring soil treatment options to treat the Class I hazardous soil to a Class II non-hazardous soil. Additional fill material that will be excavated and disposed of off-site will most likely be disposed of as Class-II non-hazardous waste. Native material beneath the fill layer is typically disposed of as Class-III waste and/or unrestricted material.

In some boring locations (at depths greater than 6.0 feet bgs) within the former remedial excavation footprints, TPH_{mo} and TPH_d were detected at concentrations ranging between 800 mg/kg and 1,800 mg/kg. The TPH concentrations are likely associated with the historical fuel bulk storage and distribution terminal. A few volatile and semi-volatile organic compounds were detected at low concentrations that would not be a health concern to construction workers. Since soil with hazardous concentrations of chromium, lead, and nickel was identified during the Phase II ESA, soil excavation tasks carried out during redevelopment activities need to be completed in accordance with a SMP. The SMP will outline proper soil handling and disposal procedures to be implemented during construction.

Construction activities will require dewatering and the groundwater contains TPH_d and TPH_{mo}, low concentrations of benzene, naphthalene, metals and elevated chloride concentrations. The groundwater quality and anticipated discharge rates and volumes are currently being discussed with the San Francisco Public Utilities Commission (SFPUC) and Regional Water Quality Control Board to determine the appropriate discharge authorization, oversight agency and required treatment prior to discharge.

Site Mitigation Plan (June 2015)

The Mission Bay is under Regional Water Quality Control Board (Water Board) oversight and development activities must be conducted according to a Risk Management Plan (RMP) prepared for the Mission Bay project area (Environ, 1999). The RMP presents the decision framework and the specific protocols for managing chemicals in the soil and groundwater in a manner that is protective of human health and the ecological environment, consistent with the existing and planned future land uses, and compatible with long-term phased development. The RMP delineates the specific risk management measures that must be implemented prior to, during, and after development of each parcel within the Mission Bay area.

In February 2000, the City and County of San Francisco submitted the Covenant and Environmental Restriction for the entire Mission Bay development site. This covenant states that the site must be developed in accordance with the 1999 Mission Bay RMP. Furthermore, the Water Board stated that rather than mandating the application of Title 27 of the California Code of Regulations (solid waste management unit regulations), each project at Mission Bay would be evaluated on a site-by-site basis for management of methane gas, if present at levels of concern. Based on the design plans that the structural slabs will be below the groundwater table, methane vapor intrusion is not a concern at the site as stated by the consultant.

The Phase II ESA results indicate that fill material beneath the site contains petroleum hydrocarbons, some low concentrations of SVOCs, and elevated concentrations of chromium, lead, and nickel. The presence of these compounds poses soil management and potential health risks to be addressed as part of the development activities. The site mitigation objectives are to minimize exposure of construction workers, nearby residents and/or pedestrians, and future site users to these constituents in the soil.

The general public will be protected through the following measures:

- The site will be fenced.
- Exposed soil will be watered frequently enough to prevent visible dust from migrating off-site.
- Soil stockpiles will be covered or stabilized with a soil binder if left idle for 7 days or more.
- Water will be misted or sprayed during the loading of soil onto trucks for off haul.
- Trucks transporting contaminated soil will be covered with a tarpaulin or other cover.
- The wheels of the trucks exiting the site will be cleaned prior to entering public streets.
- Public streets will be swept daily if soil is visible; excavation and loading activities will be suspended if the hourly average wind speed exceeds 25 miles per hour.
- The fence will be posted with no trespassing signs and signs in accordance with the requirements of the safe drinking water and toxic enforcement act (Proposition 65).

Soil Management

The proposed construction activities will disturb soil during the mass excavation, site grading, and the construction of new foundations and utility lines. During all soil disturbing activities, dust control measures will be implemented to reduce potential exposure. These measures may include moisture-conditioning the soil using dust suppressants and covering the exposed soil and

stockpiles with weighed down plastic sheeting (or equivalent) to prevent wind-blown dust and erosion during rainfall events. The contractor's HASP will contain additional dust monitoring, action levels, dust control measures, and work stoppage provisions that will be followed during construction activities.

The construction activities will also be subject to the provisions of the State Water Resources Control Board Construction General Permit. Implementation of best management practices during the time construction is active will help minimize or prevent silt-laden stormwater from leaving the site. A site-specific stormwater pollution prevention plan will be prepared and implemented prior to the start of construction.

Soil Segregation, Treatment and Disposal

The excavated fill material that contains elevated concentrations of chromium, lead, and nickel, petroleum hydrocarbons, and low concentrations of VOCs and SVOCs will need to be disposed off-site at regulated landfills. Additional chemical testing of the soil may be required by the landfill prior to disposal. The areas of fill material containing soluble lead, chromium and/or nickel concentrations exceeding the State of California hazardous waste criteria are presented on Figure 3 in the report. These areas will be delineated prior to any excavation activities to ensure that the soil containing State waste levels are appropriately segregated. The remaining excavated fill material will be disposed of as Class II non-hazardous waste. The native material underlying the fill layer will most likely be removed as Class III and/or unrestricted waste. The excavation contractor shall be responsible for tracking the disposition of soil removed and hauled off-site.

It is the intention of the developer to treat soil that exceeds the State of California hazardous waste criteria before loading this soil into trucks for eventual disposal at an appropriately regulated landfill. The treatment process will take place on the site and the resultant soil will be re-tested to ensure the treatment process is successful. The treatment process will likely include mixing a concrete additive to the excavated hazardous soil via a pug mill or mixing the concrete additive in situ with rototilling type machinery. The concrete additive has the effect of reducing the solubility of the metals thereby treating the soil from a Class I California hazardous waste to a Class II non-hazardous waste. This process includes post treatment soil sampling to confirm the treatment effectiveness. Once this process is complete the treated soil will be loaded into trucks and hauled to a Class II non-hazardous regulated landfill. This treatment process is currently under evaluation.

For soil that has already been verified to be a Class II or Class III non-hazardous waste, it is the intention of the contractor to load the excavated soil generated during the construction activities directly into trucks for off-site disposal. If needed and requested by the regulated landfill, additional waste profiling of the Class II or Class III soil will be performed. The soil samples will be tested for analytes typically required by regulated landfills for soil coming from within the Mission Bay project area.

If soil stockpiling of suspected contaminated soil is to be performed, the excavation contractor shall establish appropriate soil stockpile locations on the site to properly segregate, cover, control dust, profile, and manage the excavated soil on-site. When stockpiled soil is not actively being

handled, top sheeting will be placed over the stockpile and adequately secured so that all surface areas are covered.

Soil Disposition

The contractor will establish appropriate off-site soil disposal locations and direct truck loading scheduling and/or soil stockpile locations to properly segregate, cover, moisture control, and profile the excavated soil. The contractor, on behalf of the owner, will be responsible for tracking final soil disposition. Any excavated soil considered State of California or Federal Resource Conservation and Recovery Act (RCRA) hazardous waste will be tracked using the Uniform Hazardous Waste Manifest System (USEPA Form 8700-22), as applicable. Soil not considered hazardous waste will be tracked using non-hazardous bills of lading.

The contractor will be responsible for accurate completion of the hazardous waste manifests and non-hazardous bills of lading. Records of all wastes shipped off-Site will be maintained by the contractor and will be made available for inspection on request by Langan. The final destination of wastes transported off-site will be documented in a Closure Report.

Soil Sampling

Typical soil profiling requirements for landfills are one four-point composite sample per 500 to 750 cubic yards to be disposed. The soil profiling analysis will generally follow the guidelines established by DTSC *Information Advisory Clean Imported Fill Material* as stated in the report.

If soil samples are required for analysis, the samples shall be collected using a hand tools and placed in liners or laboratory provided sample containers. The samples will be uniquely labeled, placed into an ice-chilled cooler until delivery under chain-of-custody protocol to a California-certified analytical laboratory. The soil samples collected from the stockpile shall be identified by using a progressive numbering sequence with the date of the sample collection and the location. All appropriate regulatory sampling methods, holding times, and detection limits shall be followed.

Odor Control

When needed, odor suppression measures will be implemented by the contractor to minimize odor during excavation activities. The means to be considered for minimization of odors during excavation activities includes, but are not limited to: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; (c) use of foams to cover exposed odorous soil and rock material; (d) use of chemical odorants in spray or misting systems; and, (e) use of staff to monitor odors in surrounding area.

Contingency Procedures

Hazardous materials including underground storage tanks, sumps and/or vaults, and soil with petroleum hydrocarbon odors and/or stains may be encountered during excavation activities. If unanticipated hazardous materials are encountered, the following procedures should be implemented:

- Stop work in the area where the suspect material was encountered and cover it with plastic sheets.

- Notify the site superintendent, the owner and Langan for inspection and appropriate action in the suspect area.
- Review the existing HASP and make revisions, if necessary; and have appropriately trained personnel to work with the affected materials, once directed by the contractor.

If an unexpected underground storage tank (UST) and/or associated product lines are found, arrange for a licensed tank removal contractor to properly remove and dispose of the UST. Proper permits and notifications should be in place prior to removing the UST. Impacted soil from a UST excavation will be placed onto plastic sheets and covered. Langan will complete soil sampling and analysis tasks for UST closure in accordance with San Francisco Fire Department (SFFD) and SFDPH.

- If soil staining is observed in the areas of Class I hazardous material or Class II non-hazardous material the soil can likely be off-hauled as Class I hazardous waste or Class II non-hazardous waste. If soil staining is observed in native material the affected material will be segregated, placed into a stockpile onto plastic sheets, and covered.
- If a sump and/or vaults are encountered during excavation activities, contact the owner and Langan for inspection and appropriate action. If no liquid, obvious staining or odors are observed, sump and/or vaults will likely be destroyed and disposed of. If liquid is present within the sump and/or vault and/or obvious staining and odors are observed, Langan will collect samples for analyses to determine how to properly dispose of the material.
- If stained soil or odors are observed, plastic sheeting will be placed over the affected area and the owner and Langan will be contacted for inspection and appropriate action. If the material is to be excavated, the material will be stockpiled onto plastic sheeting and covered with plastic sheeting. Soil samples will be collected and analyzed to determine proper disposal of the material.

Health and Safety Plan

The contractor will be responsible for establishing and maintaining proper health and safety (H&S) procedures to minimize worker and public exposure to site contaminants during construction. The potential health risk to on-site construction workers and the public will be minimized by developing and implementing a comprehensive HASP, which will be prepared by the contractor. All project personnel shall read and adhere to the procedures established in this HASP. A copy of this plan will be kept on site during field activities and will be reviewed and updated as necessary.

The HASP plan will describe the training requirements, i.e. trained in accordance with Section 1910.120 of 29 Code of Federal Regulations (HAZWOPER training), specific personal hygiene, and monitoring equipment that will be used during construction to protect construction workers and the general public from exposure to constituents in the soil.

A site health and safety officer (HASO) identified in the HASP will be on site at all times during excavation activities to ensure that all health and safety measures are maintained. The HASO will have authority to direct and stop (if necessary) all construction activities in order to ensure compliance with the HASP.

Dust Monitoring Control Plan (June 2015, revised July 2015)

Real-time dust monitoring will generally be conducted during potential dust generating activities, as stated by the consultant. Prior to commencement of site work, a dust monitor will be set up at an upwind location to collect continuous dust monitoring data for a period of two days, for at least eight hours each day, as stated by the consultant. The dust monitoring data collected during this interval will be used to establish baseline dust conditions.

Dust Monitoring Equipment

The dust monitors used, such as the Thermo Electron Corporation MIE Model pDR-1200 or equivalent shall be capable of:

- Continuous, unattended, real-time monitoring, data-logging, and data transmission.
- Measurement of air-borne particulates 10 micrometers in size (PM-10) or less.
- Measurement of a 10-minute time-weighted average (TWA).
- A detection limit range of between 1 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and 400,000 $\mu\text{g}/\text{m}^3$.
- Triggering visual and/or remote alarms. The visual alarm will consist of a flashing light, audible alarm, or similar, to alert on-site monitoring and/or contractor personnel a reading has been recorded above the action level. If dust monitoring personnel are not available to monitor dust onsite, a remote alarm will be used. The remote alarm will consist of a text message, email, phone message, or similar, to alert off-site monitoring personnel a reading has been recorded above the action level.

Sampling Frequency

Except in the case of heavy fog or precipitation events, the dust monitors will be set up on a daily basis, for the first week of each new, potential dust-generating activity conducted (e.g., one week of dust monitoring during demolition, one week of dust monitoring at the beginning of excavation). The dust monitors will be set up by dust monitoring personnel at the start of each work-day prior to the start of the dust generating activity, and taken down at the conclusion of each work-day, as outlined in the DCP. Additionally, dust monitoring personnel will be present on-site to monitor field conditions and consult with contractor personnel on suitable dust suppression measures at:

- The start of each new dust-generating activity, and for one to two days thereafter depending on the observed site conditions.
- The day after a reading is collected that is above the daily average action level.
- The day of and/or the day after a reading is collected that is above the 10-minute TWA action level, if any.

- The day of and/or the day after visual observation of fugitive dust crossing the project area boundary, if any.
- The day of and/or the day after complaints about dust are received, if any.

If a reading above any action levels is recorded during the initial week of dust monitoring, dust monitoring will be extended for an additional week. Dust monitoring will continue until the appropriate dust suppression measures have been established for the given activity and an entire work-week with no readings above the dust action levels has occurred. Dust monitoring will not be conducted when there is fog or a precipitation event since (1) a nuisance dust condition is not anticipated in the case of heavy fog or precipitation and (2) dust monitors are subject to damage or falsely elevated readings in the presence of excessive atmospheric moisture.

Sampling Locations

At a minimum, two dust monitors will be placed at the site perimeter. One dust monitor will be placed at an upwind location, and one dust monitor will be placed at a downwind location. Wind direction will be evaluated based on a wind sock or flag located at the site or per the nearest weather station (KCASANFR102 zip 94111) with live wind reporting. Dust monitor locations will be re-located throughout the day in the case of significant changes in the wind direction, as stated by the consultant. The dust monitor locations will be recorded in dedicated field logs.

Action Levels and Corrective Actions

The California Air Resources Board (CARB) has developed an ambient air quality standard for PM-10 of $50 \mu\text{g}/\text{m}^3$ averaged over a 24 hour period (CARB, 2012). If the daily average from perimeter monitoring exceeds $50 \mu\text{g}/\text{m}^3$, or the baseline dust conditions, whichever is higher, additional dust control measures will be implemented. The daily average will be calculated over a 24 hour period based on (1) the continuous dust monitoring data collected over the course of the work day and (2) the previously established baseline dust concentrations, extrapolated over the remainder of the 24 hour period.

Visual and/or remote alarms on the perimeter dust monitors will be set to trigger if the PM-10 level exceeds $250 \mu\text{g}/\text{m}^3$ averaged over 10 minutes. If the visual and/or remote alarms are triggered, additional dust control measures will be implemented per Table 1 and Section 4.0 of the report.

Table 1 from the DCP
Action Levels and Required Actions

Dust Condition	Required Actions
PM-10 concentration exceeds daily average of $50 \mu\text{g}/\text{m}^3$ or baseline dust conditions, whichever is higher	Review baseline dust conditions. Review work procedures. Implement additional dust control measures as needed to prevent future exceedances of the $50 \mu\text{g}/\text{m}^3$ daily average and/or minimize dust concentrations over the baseline dust conditions. Example additional dust control measures provided in Section 4.0.
PM-10 concentration exceeds 10-minute TWA of $250 \mu\text{g}/\text{m}^3$	Particulate monitor triggers an alarm. Temporarily stop work and apply more aggressive dust control measures, per Section 4.0 or similar, until the 10 minute average

	concentration drops below 250 $\mu\text{g}/\text{m}^3$.
Visible fugitive dust migrating off-site	Temporarily stop work and apply more aggressive dust control measures, per Section 4.0 or similar, until there are no visible dust clouds migrating off-site.
Neighbor complaints	Implement more aggressive dust control measures, per Section 4.0 or similar.

Fugitive Dust

Fugitive dust migration from the site will be visually assessed by dust monitoring personnel and/or contractor personnel. If, during the course of the work, fugitive dust is observed migrating from the site, additional dust control measures will be implemented per Table 1 and Section 4.0 of the report.

General Dust Control Methods

The goal of this DMP is no visible dust. Based on the air monitoring results, visual observations of fugitive dust, and/or complaints of excessive dust generation by off-site parties, additional dust suppression measures may need to be implemented. Dust suppression measures could include, but are not limited to, the following:

- Wetting down soil improvement operations, visibly dry disturbed soil surface areas, and visibly dry disturbed unpaved driveways, parking areas, and staging areas to minimize or prevent dust from becoming airborne.
- Construction areas and roads will receive watering every two hours and at a minimum three times per eight hour shift during active operations or sufficiently often to keep the area adequately moisture conditioned. Moisture conditioning may be increased during above average temperatures, when dust generating activities intensify, or wind speeds increase.
- Covering stockpiles of excavated materials, backfill material, import material, gravel, sand, road base, and soil with polyethylene plastic sheeting, tarp, or other equivalent cover. Active stockpiles will be thoroughly wetted and excess material will be removed and/or consolidated regularly to limit the size and extent of the stockpile. The frequency of such activity will be adjusted based on weather and site conditions.
- If necessary, apply chemical dust suppressants consistent with manufacturer's directions and facilitate reapplication for non-active stockpiles.
- Using dust enclosures, dust curtains, plastic tarps, windbreaks, and dust collectors as necessary to control dust.
- Utilizing alternate work methods.
- Construction traffic on paved and unpaved roads, parking lots and staging areas will adhere to a maximum vehicle speed limit of ten (10) miles per hour (mph).
- Maintain a gravel or asphalt cover with a silt content that is less than five percent to a depth of three inches on the surfaces being used for travel.

- Paved roads within a construction site will be swept twice daily with a wet street sweeper during dust-generating activities.
- At least the first 500 feet of any public roadway exiting from the construction site will be swept twice daily during dust generating activities.
- Implementation of erosion control best management activities (BMPs) to control dust emissions from public roadways, parking areas, and any above grade unpaved staging areas or roadways.
- Construction workers will park on paved or graveled areas to reduce dust emissions.
- To the extent possible, heavy equipment will be left on the construction site and not staged outside the construction site to minimize potential for tracking soil off-site.
- Reduce vehicle trips via efficient trucking and equipment usage. Whenever possible, minimize equipment mobilization and demobilization.
- Utilize a rumble strip at all exits around the project area.
- Minimize drop heights while loading transportation vehicles.
- Use tarpaulins or other effective covers for trucks transporting soils.
- Wet sweeping or vacuuming paved streets, sidewalks, paths, and intersections where work is in progress.
- Sweeping the surrounding streets and sidewalks at least once per day during demolition, excavation, and construction so that dust is not allowed to leave the construction area.
- Installing wheel washers to clean all trucks and equipment leaving the site. In the case where wheel washers cannot be installed, brushing tires or tracks and spoil trucks off before they re-enter City streets to minimize deposition of dust-causing materials.
- Additional wetting will be required for weekends and end of workdays, should dust issues and complaints arise.
- Use of reclaimed water for dust control where applicable per San Francisco Health Code, Article 22B, Section 1242 (c)(11) and (14). Because construction dewatering discharge is anticipated to be authorized under the San Francisco Regional Water Quality Control's (Water Board) Order Number R2-2012-0012: Volatile Organic Compounds (VOCs) and Fuel General Permit, Langan will discuss the approval to use of reclaimed water with Randy Lee, the Water Board case worker.
- To reduce dust, dirt, or concrete fines from causing eye injuries during high winds, employees and onsite visitors will have proper eye protection and access to eye wash stations. The Cal/OSHA requirements for personal protection and safety will be established throughout the site.

Wind Monitoring and Requirements

Wind speeds will be documented using an on-site weather station. Wind speed data will be gathered by the on-site weather station and presented as daily or half-day average wind speeds. The data shall be collected every 10 minutes, and an audible signal set to alarm if 20 mph winds or greater are detected. A written description and reference table will accompany the weekly

reports documenting the implementation of dust control activities when 15, 20, and 25 mph wind speeds are recorded.

Wind Requirements

When wind speeds reach 20 miles per hour or greater over a ten minute time-weighted average; the contractor will increase dust control measures for 30 minutes to mitigate fugitive dust. Increased dust control measures will be documented in the field log and will be made available to the SFDPH upon request. If the increased dust control measures fail, that specific activity contributing to the dust generation shall cease. Work shall not commence, until the contractor can demonstrate adequate dust control activities at the site are effective due to changed conditions, or are no longer necessary.

The contractor will be responsible for implementing BMPs prior to winds reaching 20 mph. If wind speeds of 20 mph or greater are sustained for 30 minutes or longer dust generating activities will be ceased. Dust generating activities include, but are not limited to, excavation, grading, vehicular traffic, drilling, and equipment mobilization. The contractor will notify all subcontractors contributing to fugitive dust and instruct them to stop activity until wind speeds are below 20 mph for 30 minutes.

Table 2 from the DCP
Wind Speeds and Required Actions

Wind Speed	Required Actions
5 mph	Continue moisture conditioning of soil and street sweeping per this DMP.
10 mph	Increase frequency of moisture conditioning and street sweeping.
15 mph	Reduce vehicular traffic, cover stockpiles, and further increase moisture conditioning and street sweeping.
20 mph	Temporarily cease dust generating activity until wind speeds are recorded below 20 mph for 30 minutes or greater.

Project Signage

Signage will be posted at the site that will include the appropriate contractor contact information (i.e., telephone number) for interested parties to contact in case of complaints, such as excessive dust generation. Signage will be posted at a location that is visible from the public right-of-way. Onsite signage shall be in English, Spanish and the predominate language of construction workers on site. The signage shall include pertinent contact information of the project proponents and be clearly seen at a distance of 25 feet.

Based upon the submitted documentation, the Revised Dust Control Plan has been **conditionally approved** by EHB-SAM. Review of the all the information provided by the documents submitted to date, further documentation / investigation is warranted prior to conclusion of the Maher process.

1. The SMP mentions that it is the intent of the contractor to use a portable treatment unit (i.e. pug mill or rototiller) to treat contaminated soil. These methods have not been officially decided upon as stated by the consultant. When the owner and the general contractor have decided which remediation method will be most effective for the construction schedule; the appropriate permits as necessary shall be provided to this Department.
2. Please submit a Dust Control Plan **addendum** to address the following. This information will be requested in all future projects across the City and County of San Francisco.

The goal of the Dust Control Plan is NO VISIBLE DUST. It is understood that soil disturbance and excavation activities produce dust, dust controls will be used to mitigate visible dust as it occurs. In the event that visible dust from soil disturbance or excavation is observed onsite, but does not cross the construction area boundary, the following procedures or comparable actions shall be followed. All activities listed herein, shall be addressed by the revised DMP.

Section 3.4 – Sampling Frequency:

- A. Dust monitors shall not be removed at the end of the day and reset up in the morning. This does not allow the Golden State Warriors and / or their representatives to monitor the site during off hours and on weekends. You may swap out the monitors / batteries every morning with a fully charged unit.
- B. In the event of heavy fog, the Golden State Warriors and / or their representatives shall continue to monitor the site. Though there are concerns of false readings, you may summarize in the weekly log that the anomalies were due to fog or other weather event as an explanation. For precipitation, the equipment should either be outfitted with a weather-protector enclosure or select equipment made for outdoor continuous monitoring.
- C. Specify that Third Party personnel shall only be used for visual monitoring of conditions and not for particulate monitoring. The DCP shall be revised to include this.

Section 3.5 – Sampling Locations:

- D. The sampling locations of the monitors should not change every day and shall remain consistent throughout the project. As a suggestion, determine the prevailing wind direction and set up the weather station / dust monitors for a period before dust generating activities begin to determine background levels.
- E. Two sets of dust monitors will be required (4 total) of upwind / downwind locations for a site this size.

Section 3.6: Action Levels and Corrective Actions:

- G. Use of the 24 hour average will not provide enough information to determine what may be causing an increased level of dust; which is necessary to improve dust control measures specific to those processes. Instead, the site shall have monitors register average measurements every 15 minutes (or 30, 45, 60, etc.), whatever the site determines is necessary with justification). This is to ensure that the overall daily average is kept at a minimum. When alerted that the dust levels are over the limit for the decided upon time, increased dust control measures (or apply additional measures) must be employed until the levels are reduced. If the Golden State Warriors and / or their representatives continue to experience increased levels and cannot control the dust, they shall discontinue that work. The proposal of 250 $\mu\text{g}/\text{m}^3$ cannot be accepted by this Department without justification (i.e. high background level data). The Table layout is adequate but shall be revised to reflect the changes above.

Section 4.0: General Dust Control Measures:

- H. Specify “nontoxic” chemical dust suppressants.
- I. Specify wet sweeping in the bullet starting with “At least the first 500 feet...” and “Sweeping the surrounding streets and sidewalks...”

Section 5.1: Wind Monitoring:

- J. Please provide details for the required 2 consecutive 10 minute weighted averages of 15, 20, and 25 mph. (For example, at 2 intervals of 15mph, the foreman walks the site looking for visible dust and increasing measures if found. At 2 intervals of 20mph, increased measures automatically applied and foreman discontinues process if visible dust observed after applying increased measures. At 2 intervals of 25mph, dust generating work stopped.) The report proposes the stop work at 20mph sustained for 30 minutes. To be consistent with other projects around the City, the two - 10 minute intervals at 25 mph, will be the required standard. Please update the Table to reflect the above requirements.

Section 6.2 – Signage:

- K. “Signage will be posted at a location that is visible from the public right-of-way. Onsite signage shall be in English, Spanish and the predominate language of construction workers on site,” as stated by the consultant. Please correct this statement and include signage shall include the predominate language for the *neighboring area* and seen at a distance of 25 feet towards the street from the perimeter fence line.
3. Please include site maps and photographs to illustrate site activities that may generate dust. Please reference project number **SMED 1154** for all submitted documentation.

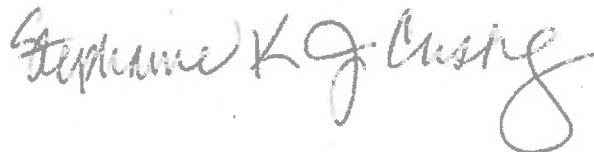
4. Ensure that all other Federal, State and local statutes, codes, regulations or ordinances are followed when applicable.
5. Please submit a Final Report at completion of the project.
6. Ensure that all Maher fees and invoices are paid and up to date, otherwise the final No Further Action letter will not be issued.
7. Please submit all documents as a .pdf and open word document on a CD, otherwise your information will be returned to you.

Should you have any questions please contact Martita Lee M Weden, Sr. Environmental Health Inspector at (415) 252-3938 / martita.lee.m.weden@sfdph.org or Stephanie Cushing, Principal Environmental Health Inspector at (415) 252-3926 / stephanie.cushing@sfdph.org .

Sincerely,



Martita Lee M Weden, MS, CA USTI
Senior Environmental Health Inspector



Stephanie K.J. Cushing, MSPH, CHMM, REHS
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City and County of San Francisco
DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH

Edwin M. Lee, Mayor
Barbara A. Garcia, MPA, Director of Health

Richard J. Lee, MPH, CIH, REHS
Acting Environmental Health Director

November 3, 2015

Steve Collins
Golden State Warriors Arena
1011 Broadway
Oakland, CA 94607
Scollins@warriors.com

**Subject: DUST MONITORING PLAN APPROVAL
GOLDEN STATE WARRIORS ARENA
BLOCKS 29 - 32, SAN FRANCISCO, CA 94158
EHB-SAM No.: SMED 1154**

Dear Mr. Collins:

In accordance with the San Francisco Health Code, Article 22A and the Building Code, Section 106.3.2.4 – Hazardous Substances; the San Francisco Department of Public Health, Environmental Health Branch, Site Assessment and Mitigation (EHB-SAM) has reviewed the following documents:

- Phase 2 Environmental Site Assessment, Golden State Warriors Arena, Blocks 29 Through 32 - Mission Bay, San Francisco CA, prepared by Langan Treadwell Rollo, June 2015
- Site Mitigation Plan, Golden State Warriors Arena, Blocks 29 Through 32 - Mission Bay, San Francisco CA, prepared by Langan Treadwell Rollo, June 2015
- Dust Monitoring Plan, Golden State Warriors Arena, Blocks 29 Through 32 - Mission Bay, San Francisco CA, prepared by Langan Treadwell Rollo, June 3, 2015
- Email RE: Potholing along 3rd Street, prepared by Dustyne Sutherland of Langan Treadwell Rollo, June 9, 2015
- Email RE: Potholing along 3rd Street with a Temporary Stockpile of Less Than 50 yd³, prepared by Adam Brown of Langan Treadwell Rollo, June 17, 2015
- Revised Dust Monitoring Plan, Golden State Warriors Arena, Blocks 29 Through 32, Mission Bay, San Francisco, CA, prepared by Langan Treadwell Rollo, July 21, 2015
- Revised Dust Monitoring Plan, Golden State Warriors Arena, Blocks 29 Through 32, Mission Bay, San Francisco, CA, prepared by Langan Treadwell Rollo, October 2015

Site Description and Proposed Project

The site is located within an area bound by Third Street on the west, South Street on the north, Terry A. Francois Boulevard on the east and 16th Street on the south, as shown on Figure 1 of the report. The project area has approximate plan dimensions of 760 by 620 feet and encompasses approximately 10.9 acres.

The proposed development will consist of three main areas. Additionally, Terry A. Francois Boulevard will be re-aligned to run north to south on the east side of Blocks 30 and 32, in accordance with the Mission Bay master infrastructure plan following arena construction; note that the realignment of Terry A. Francois Boulevard is not addressed in the report.

- **Arena** – The arena structure will be approximately eight stories high. The arena has a total planned excavation depth of 12 feet bgs.
- **Parking and Plaza** – The parking and plaza will consist of parking, restaurants, retail and office buildings up to 11 stories high. The parking and plaza areas have a total planned excavation depth of 24.5 feet bgs. Some portions of the plaza area will not include subgrade parking and have a total excavation depth to approximately 14 feet bgs.
- **Practice Courts** – The practice court has a total planned excavation depth of 18.5 feet bgs.
- **Conduct pothole activity** along the sidewalk parallel to 3rd street, South Street, and 16th Street. The total amount of material disturbed will be limited to less than 50 yd³. The goal of this task is to look for an existing joint utility trench which if present will impact the current design of the parking structure. Potholes will be excavated and material will be stockpiled onsite per the requirements in the SMP. Each pothole will be securely covered after excavation and will be backfilled with the removed stockpiled material once the survey of the joint trench is complete. The contractors propose that the material be stockpiled for the duration of the pothole survey, which is approximately 1 week. The excavated material would then be used to backfill the pothole locations. Stockpiling of material would only be temporary. The contractor and subcontractor will follow the SMP for proper soil handling procedures and will implement proper dust control as outlined in an approved DMP.

The property is identified as San Francisco County Assessor's Parcel Number: Block 8722, Lot 001.

Historical Site Usage

Originally, the site was below water in a shallow bay known as Mission Bay. The tip of historic Point San Quentin was located just south of the site, along the 1852 San Francisco shoreline. Starting in the late 1860s, Mission Bay was reclaimed by placing fill. A review of historic maps and documents indicates that the site was reclaimed starting around 1869 with soil and rock from nearby Irish Hill and the Second Street cut. Filling of the site was completed between 1906 and 1910 with fill and building rubble from the 1906 San Francisco earthquake. In addition, a structure named Long Bridge was constructed along what is now 3rd Street; this structure was a timber pile-supported bridge that crossed Mission Bay from north to south.

The 10.9 acre site is vacant with paved parking areas (portions of Blocks 29 through 31) and an unpaved vacant lot (Block 32). With the exception of an area in the southern portion of the site, the ground surface is relatively flat, with elevations ranging from about 99 to 103 feet. There is a depressed area in the southern portion where an excavation was performed for an environmental cleanup and partially backfilled.

The site is located at the Pier 64 area of Mission Bay, historically used for a variety of industrial purposes primarily related to bulk oil storage and transfer operations. Former operations included the following:

- Bulk fuel storage and distribution (approximately 1902 to 1966).
- Railroad operations (approximately 1904 to 1939).
- A machine shop (approximately 1904 to 1927).
- A boiler house (approximately 1904 to 1927).
- Steel mill (approximately 1906 to 1928).
- Well casing manufacturer (1907 to 1975).
- Warehousing, shipping, and receiving operations for a variety of products including agricultural chemicals, lumber, food, automobiles, metals, etc. (approximately 1910 to 2006).
- A fruit cannery (approximately 1935 to 1961).
- Junk yards, vehicle parking, and vehicle maintenance facilities (approximately 1950 to 2004).
- Ready-mix concrete facilities (approximately 1972 to 2010).

Subsurface Conditions

Langan and others have completed previous geotechnical and environmental investigations at the site. A profile location map showing historical boring locations and two idealized subsurface profiles (Appendix A, Figures A-1 through A-3) illustrate the general subsurface conditions, consisting of fill, Bay Mud, Colma Formation sand, sand layers, Old Bay Clay, and bedrock (Langan, 2011). Boring logs from the December 2014 and January 2015 investigation are presented in Appendix A. Where explored, the site is blanketed by approximately 7 to 25 feet of fill overlying Bay Mud. The fill consists of gravel, sand, and clay mixtures, with brick, rock (including serpentinite), and other rubble. The sand and gravel are loose to very dense, and the clay is soft to stiff. The fill likely also includes cobble- and boulder-sized pieces of serpentinite and other materials that were apparent from the drilling but could not be recovered from the samplers. The Bay Mud is a weak and compressible marine clay deposit. This layer ranges from about 2.5 to 46.5 feet thick, generally becoming thicker to the north. Based on the physical setting of Mission Bay, the elevation of the Bay Mud varies across the site, hence the fill thickness also varies.

A medium dense to very dense clayey sand, silty sand and sand with clay and stiff to hard sandy clay, clay with sand and clay was encountered below the Bay Mud. Where encountered the sand and clay layers total 3 to 31 feet thick. A medium dense to very dense sand, sand with clay, clayey sand, silty sand and sand with silt, known as the Colma Formation, was encountered

below the sand and clay in portions of the site. The top of the Colma formation was encountered about 19 to 70 feet bgs. Where encountered, the sand is approximately 5 to 35 feet thick. The Colma Formation generally becomes thicker to the north and west.

A stiff to hard clay known as Old Bay Clay, very stiff to hard sandy clay, clay, gravelly clay with sand and clay with gravel and dense to very dense sand with silt and clayey sand were encountered below the Colma Formation to bedrock. Bedrock was encountered at depths ranging from 32 to 130 feet. Bedrock generally becomes deeper to the northwest and consists of serpentinite, greenstone, shale, and claystone of the Franciscan Complex. The rock is crushed to intensely fractured, soft to moderate hardness, and friable to weak, with deep to moderate weathering.

As part of data collection for construction dewatering and structural design efforts, three piezometers (PZ-01 through PZ-03) were installed on 18 September 2014 by Langan. Groundwater has been measured in PZ-01, PZ-02, and PZ-03 on site at approximately 6.5 to 12 feet bgs. In PZ-01, depth to groundwater has been influenced by a periodic dewatering system located to the south and adjacent to the Site at 16th and Terry A. Francois Boulevard. Local groundwater flow patterns vary in this area due to the heterogeneous nature of the fill and tidal fluctuations, but the overall direction of shallow groundwater flow at the site is generally southeast toward San Francisco Bay.

Previous Investigations and Remedial Actions

Past activities within the Pier 64 area, specifically at the former petroleum terminals and related pipelines, significantly impacted environmental conditions at the site. On 15 June 2005, the Water Board adopted Order No. R2-2005-0028, which set forth the final cleanup requirements and redefined the Pier 64 area into six OUs. Portions of the site within the North Terminal OU include the southeastern portion of Block 29, southern portion of Block 30, eastern half of Block 31, and entirety of Block 32. Responsible parties for the investigation and cleanup of the Pier 64 area, including North Terminal OU, are ARCO, Chevron, Phillips, UNOCAL, and Texaco (collectively referred to as the "Pier 64 Group" - primary dischargers) and the City and County of San Francisco and Esprit (secondary dischargers).

One 13,500-gallon diesel underground storage tank (UST), formerly operated by the Pacific Coast Bus/Franciscan Bus Line, was removed from Block 31 in 1987, and one 1,000-gallon gasoline UST, formerly operated by Filbert Warehouse Corporation, was removed from Block 32 in 1997. These USTs were located within the area of the separate phase hydrocarbons (SPH) plume in the North Terminal OU. Free product was present near the water table during removal of both USTs.

One 4,000-gallon diesel UST, one 10,000-gallon UST, and one 5,000-gallon gasoline UST were formerly located at the portions of Blocks 29 and 31. The USTs were permanently removed in 1995, followed by sampling and removal actions for localized soil and groundwater impacts. Tank closures were conducted under the authority of the SFDPH Local Oversight Program (LOP) and the Water Board. The LOP and Water Board issued case closure for these USTs in February 1995.

Mission Bay Subsurface Investigations in 1997 and 1998

Environ conducted several subsurface investigations in Mission Bay Blocks 29 through 32 in 1997 and 1998. Total petroleum hydrocarbons as diesel (TPHd) and TPH as motor oil (TPHmo) were detected in soil and groundwater, in areas of former bulk petroleum storage, pipelines and transfer facilities. A measureable amount of SPH was observed at the groundwater table in two areas within Blocks 29 and 32. Metals were detected in soil at concentrations typically associated with Mission Bay fill materials. Asbestos was detected in soil and was attributed to the likely presence of Serpentine bedrock, a common constituent in Mission Bay fill material. The SPH areas of impact were subsequently remediated as discussed below.

Phase I Remedial Excavation in 2001

The Phase I remedial action was implemented by Clayton in 2001. Approximately 14,020 tons of visibly stained soil was excavated to a depth of 2 feet below the groundwater surface (to approximately 9 feet bgs). SPH was removed from the exposed groundwater surface within the excavation and an SPH collection trench and high-density polyethylene (HDPE) sheeting was installed along the western edge of the excavation to minimize the lateral migration of floating SPH. Soil containing residual oil below the target zone was left in place.

Phase II Remedial Excavation in 2005

A Phase II remedial action was completed within the Pier 64, including portions of the site, in 2005 through 2006. On-site activities included demolition and disposal of above ground structures, excavation and stockpiling of overburden soils, excavation of 90,000 tons of SPH impacted soils to a depth of approximately 2 feet below the ground water level (to approximately 9 feet bgs), dewatering, removal of SPH from the exposed groundwater surface, and backfilling the excavation. The excavation was backfilled using crushed concrete from on-site demolition activities and overburden from the respective operable units that met the Mission Bay RMP reuse criteria. On 22 December 2006, the Water Board issued a no further action letter to the Pier 64 Group for soil remediation activities within the Pier 64 OUs, including portions of the site.

Groundwater Monitoring

The Water Board required the Pier 64 Group to develop and implement a Groundwater Monitoring Program (GMP) to continue to assess groundwater quality. The GMP comprised approximately 20 active monitoring wells for the Pier 64 area. The Water Board approved ARCADIS' site closure request on 31 May 2013. Based on post-remediation groundwater monitoring results, the Water Board rescinded Order R2-2005-0028 and approved destruction of all on site monitoring wells. In June 2013, ARCADIS abandoned 20 monitoring wells at the Pier 64 area (ARCADIS, 2013).

Strata Phase I Environmental Site Assessment (ESA), September 2010

The significant findings identified in Strata's Phase I ESA report are related to the historic fill materials underlying the site and the past industrial site activities including oil bulk storage and transfer operations, railroad operations, warehousing, and vehicle maintenance operations. However, extensive soil and groundwater remediation activities have taken place at the site and the remaining environmental conditions can be effectively managed by the Mission Bay RMP.

Langan Phase I ESA Update, April 2010

Langan completed a Phase I ESA update on behalf of Strada in April 2014. Based the review of regulatory files, the site history, and site reconnaissance, this assessment revealed no substantial changes, or additional recognized environmental concerns (RECs) at the site since the September 2010 Phase I ESA report was completed.

Phase 2 Subsurface Investigation (December 2014)

The initial phase investigation was completed in December 2014. The initial sampling also included the collection of groundwater samples from the three existing piezometers (PZ-1, PZ-2 and PZ-3).

In January 2015, the second step-out phase was conducted to further characterize hazardous waste types proposed for excavation and to facilitate off-site disposal and/or on-site treatment prior to off-site disposal. Additional borings and samples were collected near the initial phase borings at depths where chromium, lead, and nickel were present at levels that exceeded hazardous waste criteria. To assist with the dewatering and to evaluate if groundwater pretreatment will be required prior to discharge to the sanitary sewer and to confirm detections reported in December, PZ-01, P-02 and PZ-03 were sampled in March 2015 for ph, chloride and nickel.

As discussed on 14 November 2014 during a meeting with SFDPH regarding the draft Work Plan and based on the design plans that the structural slabs will be below the groundwater table, soil gas samples were not collected because methane vapor intrusion would not be a concern. The groundwater volatile organic compound (VOC) and total petroleum hydrocarbons as gasoline (TPHg) sampling results conducted as part of the initial investigation phase were compared to Water Board vapor intrusion Environmental Screening Levels.

On 22 and 23 December 2014, Gregg Drilling & Testing, Inc. (Gregg) of Martinez California, a C-57 licensed drilling company, advanced 15 borings using a combination direct push/hollow stem auger drill rig for the collection of soil samples within the three proposed areas of development (Arena, Parking and Plaza, and Practice Facility). On 10 December 2014, groundwater samples were collected from the three piezometers (PZ-1, PZ-2 and PZ-3). The sample locations and boring depths are shown on Figure 3 of the report.

Arena – Six borings (LB-6 through LB-9, LB-11 and LB-12) were drilled between 13 feet bgs and 22 feet bgs. Approximately four to six soil samples were collected from each boring at 2.5 to 5 foot intervals.

Parking and Plaza – Eight borings (LB-1 through LB-5, LB-10, LB-13 and LB-15) were drilled between approximately 12 feet bgs and 33 feet bgs. Approximately four to ten samples were collected from each boring at 2.5 to 5 feet intervals. Two groundwater grab samples were collected from the existing temporary piezometers PZ-1 and PZ-2.

Practice Facility - One boring (LB-14) was drilled to approximately 25 feet bgs. Approximately nine soil samples were collected from the boring at 2.5 to 5 foot intervals. One groundwater grab sample was collected from existing temporary piezometer PZ-3.

Soil Sampling

Soil samples were collected using dual-tube direct push drilling technology. Continuous soil cores were collected inside a sample barrel, lined with 5-foot-long clear acetate sample liners. The soil cores were visually logged by Langan's SBE subconsultant Albion Partners personnel in general accordance with the Unified Soil Classification System (USCS), using ASTM D-2488-09a, visual/manual procedure, working under the supervision of a Langan California professional geologist. Soil was screened for organic vapors using a calibrated photoionization detector (PID).

The selected soil sampling interval was cut from the acetate sample liner. The ends of each sample liner were covered with Teflon sheets, capped at each end, appropriately labeled, and placed in an ice filled chest cooled to 4°. The samples were submitted under chain-of-custody protocol to Curtis & Tompkins Laboratories (C&T) of Berkeley, California, a State of California certified laboratory. After the final sample was collected at each boring location, each soil boring was backfilled with neat cement grout delivered via a tremie pipe, under the oversight of an SFDPH inspector.

Soil samples were analyzed for some or all of the compounds listed below based on Table 1 of the Work Plan, visual observations, and PID readings:

- TPHg, TPH as diesel (TPHd), and TPH as motor oil (TPHmo) by Modified Environmental Protection Agency (EPA) Method 8015B;
- VOCs by EPA Method 8260B;
- Semi-volatile organic compounds (SVOCs) by EPA Method 8270C;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082;
- California assessment manual (CAM) 17 metals by EPA Method 6010 and EPA Method 7471A;
- Leaking Underground Fuel Tank (LUFT) 5 Metals (6010B);
- Total lead by EPA Method 6010;
- Asbestos by California AIR Resources Board (CARB 435);
- pH by EPA Method 9045D;
- Cyanide by Standard Method SM4500CN-E.

If metal concentrations exceeded the Total Threshold Limit Concentrations (TTLC) or if total metal concentrations exceeded the soluble threshold limit concentration (STLC) by 10 times, soil samples were analyzed by the California Waste Extraction (WET) Method to evaluate if the results exceed the State of California Class I hazardous waste criteria. If a soluble metal result exceeded the STLC, the sample was analyzed by Toxicity Characteristic Leaching Procedure (TCLP), to evaluate if the concentration exceeds the Resource Conservation and Recovery Act (RCRA) or federal hazardous waste criteria.

Groundwater Sampling

In December 2014, three on site piezometers (PZ-1 through PZ-3) were sampled to facilitate obtaining a batch waste water discharge permit for disposal of groundwater pumped during construction and to satisfy the Maher Ordinance requirements. Groundwater samples were collected in accordance with the low flow groundwater sampling procedures as outlined in the Work Plan. Groundwater samples were collected directly into laboratory-supplied and preserved sample containers, appropriately labeled, and stored in an ice-cooled chest until delivery to C&T.

Groundwater samples collected from piezometers PZ-1 through PZ-3 were analyzed for some or all of the compounds listed below:

- TPHd, and TPHmo by EPA Method 8015B following silica gel preparation by EPA Method 3630C;
- TPHg by EPA Method 8015B;
- VOCs by EPA Method 8260B;
- SVOCs by EPA Method 8270C SIM;
- CAM 17 Metals by EPA Method 6020 and EPA Method 7470A;
- LUFT 5 Metals by EPA Method 6010B;
- pH by EPA Method 9040C;
- Cyanide by Standard Method SM4500CN-E;
- Dissolved Sulfides by Standard Method SM4500S2-D;
- Total Suspended Solids by Standard Method SM5220D;
- Chemical Oxygen Demand by Standard Method SM5220D;
- Phenols by EPA Method 420.1; and
- Flashpoint by ASTM D-93.

January 2015 Field Investigation

From January 26 - 28, 2015, Gregg of Martinez California, a C-57 licensed drilling company, advanced 15 additional step-out borings using a combination direct push/hollow stem auger drill rig to facilitate the collection of soil samples. The purpose of the step-out boring program was to further profile the anticipated waste types identified in the December 2014 initial investigation and to delineate the top and thickness of the Bay Mud lithologic unit.

- Arena – Seven borings (LB-19 through LB-21, and LB-26 through LB-28 and LB-31) were drilled to total depths of between 15.5 feet bgs to 17 feet bgs. Two to five soil samples were collected from each boring.
- Parking and Plaza – Nine borings (LB-16 through LB-18 and LB-22 through LB-25 and LB-29 through 30) were drilled to total depths of between approximately 12 feet and 30 feet bgs. One to four samples were collected from each boring.
- Practice Facility - Two borings (LB-32 and LB-33) were drilled to a total depth of approximately 22 feet bgs. One soil sample was collected from each boring location.

March 2015 Groundwater Sampling

In March 2015, to assist with the evaluation of construction dewatering options and groundwater pre-treatment prior to discharge, piezometers PZ-1 through PZ-3 were sampled for ph, chloride and total nickel using the same methods discussed above in Section 5.2.2.

Analytical Results

Non Metal Compounds

TPHg was present above the laboratory reporting limit in 5 of the 44 samples analyzed at concentrations ranging from 1.5 milligrams per kilogram (mg/kg) to 9.9 mg/kg. TPHd was present above the laboratory reporting limit in 41 of the 44 samples analyzed at concentrations ranging from 1.0 mg/kg to 1,300 mg/kg. TPHmo was present above the laboratory reporting limit in 35 of the 44 samples analyzed at concentrations ranging from 8.2 mg/kg to 1,800 mg/kg.

- 1,2,4-Trimethylbenzene was detected in 1 of 28 samples analyzed at a concentration of 0.0078 mg/kg;
- Acetone was detected in 11 of 28 samples analyzed at concentrations ranging from 0.019 to 0.17 mg/kg;
- Carbon disulfide was detected in 2 of 28 samples analyzed at concentrations ranging from 0.0079 to 0.0083 mg/kg;
- Ethylbenzene was detected in 1 of 28 samples analyzed at a concentration of 0.007 mg/kg;
- 2-Butanone was detected in 1 of 28 samples analyzed at a concentration of 0.032 mg/kg;
- o-xylene was detected in 1 of 28 samples analyzed at a concentration of 0.0068 mg/kg;
- m, p- xylenes was detected in 1 of 28 samples analyzed at a concentration of 0.011mg/kg.
- All other VOCs were not present above laboratory detection limits.

The following SVOCs were present above laboratory detection limits:

- Acenaphthene was detected in 1 of 29 samples analyzed at a concentration of 0.028 mg/kg;
- Acenaphthylene was detected in 5 of 29 samples analyzed at concentrations ranging from 0.011 mg/kg to 0.18 mg/kg;
- Anthracene was detected in 10 of 29 samples analyzed at concentrations of 0.012mg/kg to 0.14 mg/kg;
- Benzo(a)anthracene was detected in 12 of 29 samples analyzed at concentrations of 0.0058 mg/kg to 0.53 mg/kg;
- Benzo(a)pyrene was detected in 15 of 29 samples analyzed at concentrations of 0.005 mg/kg to 2.1 mg/kg;
- Benzo(b)fluoranthene was detected in 17 of 29 samples analyzed at concentrations of 0.0071 mg/kg to 1.9 mg/kg;
- Benzo(g,h,i)perylene was detected in 12 of 29 samples analyzed at concentrations of 0.0074 mg/kg to 1.8 mg/kg;
- Benzo(k)fluoranthene was detected in 9 of 29 samples analyzed at concentrations of 0.018 mg/kg to 0.42 mg/kg;

- Chrysene was detected in 15 of 29 samples analyzed at concentrations of 0.0069 mg/kg to 0.71 mg/kg;
- Dibenz(a,h)anthracene was detected in 5 of 29 samples analyzed at concentrations of 0.019 mg/kg to 0.53 mg/kg;
- Fluoranthene was detected in 16 of 29 samples analyzed at concentrations of 0.0087 mg/kg to 0.72 mg/kg;
- Fluorene was detected in 6 of 29 samples analyzed at concentrations of 0.012 mg/kg to 0.085 mg/kg;
- Indeno(1,2,3-c,d)pyrene was detected in 10 of 29 samples analyzed at concentrations of 0.0054 mg/kg to 1.7 mg/kg;
- Naphthalene was detected in 5 of 29 samples analyzed at concentrations of 0.0098 mg/kg to 0.74 mg/kg;
- Phenanthrene was detected in 17 of 29 samples analyzed at concentrations of 0.0078 mg/kg to 0.39 mg/kg; and
- Pyrene was detected in 17 of 29 samples analyzed at concentrations of 0.0074 mg/kg to 0.9 mg/kg.

All other SVOCs were not detected above laboratory reporting limits.

The PCB Aroclor 1254 was detected in 1 of 7 samples analyzed at a concentration of 0.016 mg/kg. All other PCBs were not present above laboratory detection limits. Cyanide and sulfide were not detected above laboratory limits in any of the samples analyzed.

Metals

- Antimony was detected in seven out of 17 samples analyzed at concentrations ranging from 0.28 mg/kg to 5 mg/kg
- Arsenic was detected in 15 out of 17 samples analyzed at concentrations ranging from 0.3 mg/kg to 13 mg/kg
- Barium was detected in 17 out of 17 samples analyzed at concentrations ranging from 3.9 mg/kg to 360 mg/kg
- Beryllium was detected in 11 out of 17 samples analyzed at concentrations ranging from 0.26 mg/kg to 0.45 mg/kg;
- Cadmium was detected in 31 out of 44 samples analyzed at concentrations ranging from 0.31 mg/kg to 1.7 mg/kg
- Cobalt was detected in 17 out of 17 samples analyzed at concentrations ranging from 3.9 mg/kg to 93 mg/kg
- Copper was detected in 17 out of 17 samples analyzed at concentrations ranging from 5.6 mg/kg to 110 mg/kg
- Mercury was detected in 12 out of 17 samples analyzed at concentrations ranging from 0.033 mg/kg to 0.58 mg/kg
- Molybdenum was detected in 9 out of 17 samples analyzed at concentrations ranging from 0.45 mg/kg to 6.7 mg/kg
- Silver was detected in 3 out of 17 samples analyzed at concentrations ranging from 0.31 mg/kg to 0.99 mg/kg
- Vanadium was detected in 17 out of 17 samples analyzed at concentrations ranging from 17 mg/kg to 50 mg/kg

- Zinc was detected in 44 out of 44 samples analyzed at concentrations ranging from 15mg/kg to 420 mg/kg.

Selenium and thallium were not detected above laboratory reporting limits. The detected metal concentrations discussed above were within normal background ranges found in northern California soils as stated by the consultant.

Total chromium was detected in 59 out of 59 samples analyzed at concentrations ranging from 27 mg/kg to 1,800 mg/kg. Forty two soil samples were analyzed for soluble chromium using the STLC by WET method. Soluble chromium was detected in 36 out of 42 samples analyzed at concentrations ranging between 0.25 milligrams per liter (mg/L) and 16 mg/L. Of the samples analyzed eight failed the California Hazardous Waste Criteria of 5 mg/L. Twenty two soil samples were analyzed for soluble chromium using the TCLP method. TCLP chromium was detected in four of the 22 samples analyzed at concentrations ranging from 0.051 mg/L to 0.12 mg/L. Of the samples analyzed by the TCLP method, none were above the Federal Hazardous Waste Criteria of 5 mg/L.

Total lead was detected in 107 out of 114 samples analyzed at concentrations ranging from 0.29 mg/kg to 1,500 mg/kg. Fifty eight soil samples were analyzed for soluble lead using the WET method. Soluble lead was detected in 56 out of the 58 samples analyzed at concentrations ranging between 0.51 mg/L and 77 mg/L. Of the samples analyzed for soluble lead, 30 results the STLC of 5 mg/L. Thirty seven soil samples were analyzed for soluble lead using the TCLP method. Soluble lead was detected in 29 of the 37 samples analyzed at concentrations ranging from 0.063 mg/L to 3 mg/L. Of the samples analyzed by the TCLP method, none were detected above the 5 mg/L Federal hazardous waste criteria.

Total nickel was detected in 62 out of 62 samples analyzed at concentrations ranging from 16 mg/kg to 2,400 mg/kg. Twenty two soil samples were analyzed for soluble nickel using the WET method. Soluble nickel was detected in 21 out of 22 samples analyzed at concentrations ranging between 0.7 mg/L and 86 mg/L. Of the samples analyzed for soluble nickel, seven exceeded the STLC of 20 mg/L. There is no TCLP established for nickel.

Groundwater Results

In the groundwater samples collected from PZ-1, PZ-2 and PZ-3, the following compounds were detected:

- Benzene was detected in PZ-1 at a concentration of 4.4 micrograms per liter (µg/L). No other VOCs were detected above laboratory reporting limits.
- Naphthalene was detected in PZ-1 at a concentration of 2.8 µg/L. No other SVOCs were detected above laboratory reporting limits.
- Chemical oxygen demand was detected in PZ-1 and PZ-2 at a concentration of 480,000 µg/L and 1,100,000 µg/L, respectively.
- Chlorides were detected in PZ-1, PZ-2 and PZ-3 at concentrations of 7,200 µg/L, 1,600 µg/L and 15,000 µg/L, respectively.
- Cyanide was detected in PZ-1 at a concentration of 10 µg/L.

- TPHg and TPHd were detected in PZ-1 at concentrations of 140 and 440 µg/L, respectively. TPHmo was not detected above the laboratory reporting limit.
- Total recoverable phenolics were detected in PZ-1 at a concentration of 330 µg/L.
- Sulfide was detected in PZ-1 at a concentration of 530 µg/L.
- Total suspended solids were detected in PZ-1 and PZ-2 at concentrations of 17,000 and 8,000 µg/L, respectively.
- The flashpoint of the water in PZ-1 and PZ-2 was 150 degrees Fahrenheit.
- pH ranged from a high of 11.8 in PZ-1 in December 2014 to a low of 7.1 in PZ-1 in March 2015.

Total Metals

In the groundwater samples collected from PZ-1, PZ-2 and PZ-3, the following total metals were detected:

- Antimony was detected in 1 out of 2 samples analyzed at a concentration of 1.3 µg/L.
- Arsenic was detected in 2 out of 2 samples analyzed at concentrations ranging from 2.2 µg/L to 8.1 µg/L.
- Barium was detected in 2 out of 2 samples analyzed at concentrations ranging from 68 µg/L to 1,600 µg/L.
- Beryllium was not detected in the samples collected from PZ-1 and PZ-3.
- Cadmium was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Chromium was detected in 1 of 3 samples analyzed at a concentration of 1.1 µg/L.
- Cobalt was detected in 1 out of 2 samples analyzed at a concentration of 1 µg/L.
- Copper was detected in 1 out of 2 samples analyzed at a concentration of 1.5 µg/L.
- Lead was detected in 1 of 3 samples analyzed at a concentration of 2.2 µg/L.
- Mercury was not detected in the samples collected from PZ-1 and PZ-3.
- Molybdenum was detected in 2 out of 2 samples analyzed at concentrations ranging from 6.6 µg/L to 39 µg/L.
- Nickel was detected in 6 out of 6 samples at concentrations ranging from 20 µg/L to 510 µg/L.
- Selenium was detected in 1 out of 2 samples analyzed at a concentration of 1.7 µg/L.
- Silver was not detected in the samples collected from PZ-1 and PZ-3.
- Thallium was not detected in the samples collected from PZ-1 and PZ-3.
- Vanadium was detected in 1 out of 2 samples analyzed at a concentration of 7.7 µg/L.
- Zinc was detected in 1 out of 3 samples analyzed at a concentration of 6.3 µg/L.
- 4.2.2.3 Dissolved Metals
 - In the groundwater samples collected from PZ-1, PZ-2 and PZ-3, the following dissolved metals were detected:
 - Antimony was not detected in the samples collected from PZ-1 and PZ-3.
 - Arsenic was detected in 2 out of 2 samples analyzed at concentrations ranging from 1.8 µg/L to 7.6 µg/L.
 - Barium was detected in 2 out of 2 samples analyzed at concentrations ranging from 58 µg/L to 1,500 µg/L.
 - Beryllium was not detected in the samples collected from PZ-1 and PZ-3.
 - Cadmium was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.

- Chromium was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Cobalt was not detected in the samples collected from PZ-1 and PZ-3.
- Copper was detected in 1 out of 2 samples analyzed at a concentration of 1.2 µg/L.
- Lead was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.
- Mercury was detected in 1 out of 2 samples analyzed at a concentration of 0.77 µg/L.
- Molybdenum was detected in 2 out of 2 samples analyzed at concentrations ranging from 5.5 µg/L to 38 µg/L.
- Nickel was detected in 3 of 3 samples at concentrations ranging from 18 µg/L to 510 µg/L.
- Selenium was detected in 1 out of 2 samples analyzed at a concentration of 1.9 µg/L.
- Silver was not detected in the samples collected from PZ-1 and PZ-3.
- Thallium was not detected in the samples collected from PZ-1 and PZ-3.
- Vanadium was detected in 1 out of 2 samples analyzed at a concentration of 6.3 µg/L.
- Zinc was not detected in the samples collected from PZ-1, PZ-2 or PZ-3.

Conclusions and Recommendations by the Consultant

The fill unit was characterized as either a State of California Class I hazardous material based on soluble chromium, lead, and nickel concentrations or a Class II non-hazardous material, likely related to debris from the 1906 earthquake and resulting fire. Generally, the Class I California hazardous material extends from the surface to 24.5 feet bgs (the deepest layer is observed in the northeast corner of site adjacent to Terry Francois Boulevard). The areas of fill material containing soluble chromium, lead, and nickel concentrations exceeding the State of California hazardous waste criteria will be disposed of off-site at a Class-I non-RCRA regulated landfill. The current developer is also exploring soil treatment options to treat the Class I hazardous soil to a Class II non-hazardous soil. Additional fill material that will be excavated and disposed of off-site will most likely be disposed of as Class-II non-hazardous waste. Native material beneath the fill layer is typically disposed of as Class-III waste and/or unrestricted material.

In some boring locations (at depths greater than 6.0 feet bgs) within the former remedial excavation footprints, TPH_{mo} and TPH_d were detected at concentrations ranging between 800 mg/kg and 1,800 mg/kg. The TPH concentrations are likely associated with the historical fuel bulk storage and distribution terminal. A few volatile and semi-volatile organic compounds were detected at low concentrations that would not be a health concern to construction workers. Since soil with hazardous concentrations of chromium, lead, and nickel was identified during the Phase II ESA, soil excavation tasks carried out during redevelopment activities need to be completed in accordance with a SMP. The SMP will outline proper soil handling and disposal procedures to be implemented during construction.

Construction activities will require dewatering and the groundwater contains TPH_d and TPH_{mo}, low concentrations of benzene, naphthalene, metals and elevated chloride concentrations. The groundwater quality and anticipated discharge rates and volumes are currently being discussed with the San Francisco Public Utilities Commission (SFPUC) and Regional Water Quality Control Board to determine the appropriate discharge authorization, oversight agency and required treatment prior to discharge.

Site Mitigation Plan (June 2015)

The Mission Bay is under Regional Water Quality Control Board (Water Board) oversight and development activities must be conducted according to a Risk Management Plan (RMP) prepared for the Mission Bay project area (Environ, 1999). The RMP presents the decision framework and the specific protocols for managing chemicals in the soil and groundwater in a manner that is protective of human health and the ecological environment, consistent with the existing and planned future land uses, and compatible with long-term phased development. The RMP delineates the specific risk management measures that must be implemented prior to, during, and after development of each parcel within the Mission Bay area.

In February 2000, the City and County of San Francisco submitted the Covenant and Environmental Restriction for the entire Mission Bay development site. This covenant states that the site must be developed in accordance with the 1999 Mission Bay RMP. Furthermore, the Water Board stated that rather than mandating the application of Title 27 of the California Code of Regulations (solid waste management unit regulations), each project at Mission Bay would be evaluated on a site-by-site basis for management of methane gas, if present at levels of concern. Based on the design plans that the structural slabs will be below the groundwater table, methane vapor intrusion is not a concern at the site as stated by the consultant.

The Phase II ESA results indicate that fill material beneath the site contains petroleum hydrocarbons, some low concentrations of SVOCs, and elevated concentrations of chromium, lead, and nickel. The presence of these compounds poses soil management and potential health risks to be addressed as part of the development activities. The site mitigation objectives are to minimize exposure of construction workers, nearby residents and/or pedestrians, and future site users to these constituents in the soil.

The general public will be protected through the following measures:

- The site will be fenced.
- Exposed soil will be watered frequently enough to prevent visible dust from migrating off-site.
- Soil stockpiles will be covered or stabilized with a soil binder if left idle for 7 days or more.
- Water will be misted or sprayed during the loading of soil onto trucks for off haul.
- Trucks transporting contaminated soil will be covered with a tarpaulin or other cover.
- The wheels of the trucks exiting the site will be cleaned prior to entering public streets.
- Public streets will be swept daily if soil is visible; excavation and loading activities will be suspended if the hourly average wind speed exceeds 25 miles per hour.
- The fence will be posted with no trespassing signs and signs in accordance with the requirements of the safe drinking water and toxic enforcement act (Proposition 65).

Soil Management

The proposed construction activities will disturb soil during the mass excavation, site grading, and the construction of new foundations and utility lines. During all soil disturbing activities, dust control measures will be implemented to reduce potential exposure. These measures may include moisture-conditioning the soil using dust suppressants and covering the exposed soil and

stockpiles with weighed down plastic sheeting (or equivalent) to prevent wind-blown dust and erosion during rainfall events. The contractor's HASP will contain additional dust monitoring, action levels, dust control measures, and work stoppage provisions that will be followed during construction activities.

The construction activities will also be subject to the provisions of the State Water Resources Control Board Construction General Permit. Implementation of best management practices during the time construction is active will help minimize or prevent silt-laden stormwater from leaving the site. A site-specific stormwater pollution prevention plan will be prepared and implemented prior to the start of construction.

Soil Segregation, Treatment and Disposal

The excavated fill material that contains elevated concentrations of chromium, lead, and nickel, petroleum hydrocarbons, and low concentrations of VOCs and SVOCs will need to be disposed off-site at regulated landfills. Additional chemical testing of the soil may be required by the landfill prior to disposal. The areas of fill material containing soluble lead, chromium and/or nickel concentrations exceeding the State of California hazardous waste criteria are presented on Figure 3 in the report. These areas will be delineated prior to any excavation activities to ensure that the soil containing State waste levels are appropriately segregated. The remaining excavated fill material will be disposed of as Class II non-hazardous waste. The native material underlying the fill layer will most likely be removed as Class III and/or unrestricted waste. The excavation contractor shall be responsible for tracking the disposition of soil removed and hauled off-site.

It is the intention of the developer to treat soil that exceeds the State of California hazardous waste criteria before loading this soil into trucks for eventual disposal at an appropriately regulated landfill. The treatment process will take place on the site and the resultant soil will be re-tested to ensure the treatment process is successful. The treatment process will likely include mixing a concrete additive to the excavated hazardous soil via a pug mill or mixing the concrete additive in situ with rototilling type machinery. The concrete additive has the effect of reducing the solubility of the metals thereby treating the soil from a Class I California hazardous waste to a Class II non-hazardous waste. This process includes post treatment soil sampling to confirm the treatment effectiveness. Once this process is complete the treated soil will be loaded into trucks and hauled to a Class II non-hazardous regulated landfill. This treatment process is currently under evaluation.

For soil that has already been verified to be a Class II or Class III non-hazardous waste, it is the intention of the contractor to load the excavated soil generated during the construction activities directly into trucks for off-site disposal. If needed and requested by the regulated landfill, additional waste profiling of the Class II or Class III soil will be performed. The soil samples will be tested for analytes typically required by regulated landfills for soil coming from within the Mission Bay project area.

If soil stockpiling of suspected contaminated soil is to be performed, the excavation contractor shall establish appropriate soil stockpile locations on the site to properly segregate, cover, control dust, profile, and manage the excavated soil on-site. When stockpiled soil is not actively being

handled, top sheeting will be placed over the stockpile and adequately secured so that all surface areas are covered.

Soil Disposition

The contractor will establish appropriate off-site soil disposal locations and direct truck loading scheduling and/or soil stockpile locations to properly segregate, cover, moisture control, and profile the excavated soil. The contractor, on behalf of the owner, will be responsible for tracking final soil disposition. Any excavated soil considered State of California or Federal Resource Conservation and Recovery Act (RCRA) hazardous waste will be tracked using the Uniform Hazardous Waste Manifest System (USEPA Form 8700-22), as applicable. Soil not considered hazardous waste will be tracked using non-hazardous bills of lading.

The contractor will be responsible for accurate completion of the hazardous waste manifests and non-hazardous bills of lading. Records of all wastes shipped off-Site will be maintained by the contractor and will be made available for inspection on request by Langan. The final destination of wastes transported off-site will be documented in a Closure Report.

Soil Sampling

Typical soil profiling requirements for landfills are one four-point composite sample per 500 to 750 cubic yards to be disposed. The soil profiling analysis will generally follow the guidelines established by DTSC *Information Advisory Clean Imported Fill Material* as stated in the report.

If soil samples are required for analysis, the samples shall be collected using a hand tools and placed in liners or laboratory provided sample containers. The samples will be uniquely labeled, placed into an ice-chilled cooler until delivery under chain-of-custody protocol to a California-certified analytical laboratory. The soil samples collected from the stockpile shall be identified by using a progressive numbering sequence with the date of the sample collection and the location. All appropriate regulatory sampling methods, holding times, and detection limits shall be followed.

Odor Control

When needed, odor suppression measures will be implemented by the contractor to minimize odor during excavation activities. The means to be considered for minimization of odors during excavation activities includes, but are not limited to: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; (c) use of foams to cover exposed odorous soil and rock material; (d) use of chemical odorants in spray or misting systems; and, (e) use of staff to monitor odors in surrounding area.

Contingency Procedures

Hazardous materials including underground storage tanks, sumps and/or vaults, and soil with petroleum hydrocarbon odors and/or stains may be encountered during excavation activities. If unanticipated hazardous materials are encountered, the following procedures should be implemented:

- Stop work in the area where the suspect material was encountered and cover it with plastic sheets.

- Notify the site superintendent, the owner and Langan for inspection and appropriate action in the suspect area.
- Review the existing HASP and make revisions, if necessary; and have appropriately trained personnel to work with the affected materials, once directed by the contractor.

If an unexpected underground storage tank (UST) and/or associated product lines are found, arrange for a licensed tank removal contractor to properly remove and dispose of the UST. Proper permits and notifications should be in place prior to removing the UST. Impacted soil from a UST excavation will be placed onto plastic sheets and covered. Langan will complete soil sampling and analysis tasks for UST closure in accordance with San Francisco Fire Department (SFFD) and SFDPH.

- If soil staining is observed in the areas of Class I hazardous material or Class II non-hazardous material the soil can likely be off-hauled as Class I hazardous waste or Class II non-hazardous waste. If soil staining is observed in native material the affected material will be segregated, placed into a stockpile onto plastic sheets, and covered.
- If a sump and/or vaults are encountered during excavation activities, contact the owner and Langan for inspection and appropriate action. If no liquid, obvious staining or odors are observed, sump and/or vaults will likely be destroyed and disposed of. If liquid is present within the sump and/or vault and/or obvious staining and odors are observed, Langan will collect samples for analyses to determine how to properly dispose of the material.
- If stained soil or odors are observed, plastic sheeting will be placed over the affected area and the owner and Langan will be contacted for inspection and appropriate action. If the material is to be excavated, the material will be stockpiled onto plastic sheeting and covered with plastic sheeting. Soil samples will be collected and analyzed to determine proper disposal of the material.

Health and Safety Plan

The contractor will be responsible for establishing and maintaining proper health and safety (H&S) procedures to minimize worker and public exposure to site contaminants during construction. The potential health risk to on-site construction workers and the public will be minimized by developing and implementing a comprehensive HASP, which will be prepared by the contractor. All project personnel shall read and adhere to the procedures established in this HASP. A copy of this plan will be kept on site during field activities and will be reviewed and updated as necessary.

The HASP plan will describe the training requirements, i.e. trained in accordance with Section 1910.120 of 29 Code of Federal Regulations (HAZWOPER training), specific personal hygiene, and monitoring equipment that will be used during construction to protect construction workers and the general public from exposure to constituents in the soil.

A site health and safety officer (HASO) identified in the HASP will be on site at all times during excavation activities to ensure that all health and safety measures are maintained. The HASO will have authority to direct and stop (if necessary) all construction activities in order to ensure compliance with the HASP.

Dust Monitoring Control Plan (June 2015, revised July 2015)

Real-time dust monitoring will generally be conducted during potential dust generating activities, as stated by the consultant. Prior to commencement of site work, a dust monitor will be set up at an upwind location to collect continuous dust monitoring data for a period of two days, for at least eight hours each day, as stated by the consultant. The dust monitoring data collected during this interval will be used to establish baseline dust conditions.

Dust Monitoring Equipment

The dust monitors used, such as the Thermo-Electron Corporation MIE Model pDR-1200 or equivalent shall be capable of:

- Continuous, unattended, real-time monitoring, data-logging, and data transmission.
- Measurement of air-borne particulates 10 micrometers in size (PM-10) or less.
- Measurement of a 10-minute time-weighted average (TWA).
- A detection limit range of between 1 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and 400,000 $\mu\text{g}/\text{m}^3$.
- Triggering visual and/or remote alarms. The visual alarm will consist of a flashing light, audible alarm, or similar, to alert on-site monitoring and/or contractor personnel a reading has been recorded above the action level. If dust monitoring personnel are not available to monitor dust onsite, a remote alarm will be used. The remote alarm will consist of a text message, email, phone message, or similar, to alert off-site monitoring personnel a reading has been recorded above the action level.

Sampling Frequency

Except in the case of heavy fog or precipitation events, the dust monitors will be set up on a daily basis, for the first week of each new, potential dust-generating activity conducted (e.g., one week of dust monitoring during demolition, one week of dust monitoring at the beginning of excavation). The dust monitors will be set up by dust monitoring personnel at the start of each work-day prior to the start of the dust generating activity, and taken down at the conclusion of each work-day, as outlined in the DCP. Additionally, dust monitoring personnel will be present on-site to monitor field conditions and consult with contractor personnel on suitable dust suppression measures at:

- The start of each new dust-generating activity, and for one to two days thereafter depending on the observed site conditions.
- The day after a reading is collected that is above the daily average action level.
- The day of and/or the day after a reading is collected that is above the 10-minute TWA action level, if any.

- The day of and/or the day after visual observation of fugitive dust crossing the project area boundary, if any.
- The day of and/or the day after complaints about dust are received, if any.

If a reading above any action levels is recorded during the initial week of dust monitoring, dust monitoring will be extended for an additional week. Dust monitoring will continue until the appropriate dust suppression measures have been established for the given activity and an entire work-week with no readings above the dust action levels has occurred. Dust monitoring will not be conducted when there is fog or a precipitation event since (1) a nuisance dust condition is not anticipated in the case of heavy fog or precipitation and (2) dust monitors are subject to damage or falsely elevated readings in the presence of excessive atmospheric moisture.

Sampling Locations

At a minimum, two dust monitors will be placed at the site perimeter. One dust monitor will be placed at an upwind location, and one dust monitor will be placed at a downwind location. Wind direction will be evaluated based on a wind sock or flag located at the site or per the nearest weather station (KCASANFR102 zip 94111) with live wind reporting. Dust monitor locations will be re-located throughout the day in the case of significant changes in the wind direction, as stated by the consultant. The dust monitor locations will be recorded in dedicated field logs.

Action Levels and Corrective Actions

The California Air Resources Board (CARB) has developed an ambient air quality standard for PM-10 of $50 \mu\text{g}/\text{m}^3$ averaged over a 24 hour period (CARB, 2012). If the daily average from perimeter monitoring exceeds $50 \mu\text{g}/\text{m}^3$, or the baseline dust conditions, whichever is higher, additional dust control measures will be implemented. The daily average will be calculated over a 24 hour period based on (1) the continuous dust monitoring data collected over the course of the work day and (2) the previously established baseline dust concentrations, extrapolated over the remainder of the 24 hour period.

Visual and/or remote alarms on the perimeter dust monitors will be set to trigger if the PM-10 level exceeds $250 \mu\text{g}/\text{m}^3$ averaged over 10 minutes. If the visual and/or remote alarms are triggered, additional dust control measures will be implemented per Table 1 and Section 4.0 of the report.

Table 1 from the DCP
Action Levels and Required Actions

Dust Condition	Required Actions
PM-10 concentration exceeds daily average of $50 \mu\text{g}/\text{m}^3$ or baseline dust conditions, whichever is higher	Review baseline dust conditions. Review work procedures. Implement additional dust control measures as needed to prevent future exceedances of the $50 \mu\text{g}/\text{m}^3$ daily average and/or minimize dust concentrations over the baseline dust conditions. Example additional dust control measures provided in Section 4.0.
PM-10 concentration exceeds 10-minute TWA of $250 \mu\text{g}/\text{m}^3$	Particulate monitor triggers an alarm. Temporarily stop work and apply more aggressive dust control measures, per Section 4.0 or similar, until the 10 minute average

	concentration drops below 250 $\mu\text{g}/\text{m}^3$.
PM-10 concentration exceeds 10-minute TWA of 250 $\mu\text{g}/\text{m}^3$	Particulate monitor triggers an alarm. Temporarily stop work and apply more aggressive dust control measures, per Section 4.0 or similar, until the 10 minute average concentration drops below 250 $\mu\text{g}/\text{m}^3$.
Visible fugitive dust migrating off-site	Temporarily stop work and apply more aggressive dust control measures, per Section 4.0 or similar, until there are no visible dust clouds migrating off-site.
Neighbor complaints	Implement more aggressive dust control measures, per Section 4.0 or similar.

Fugitive Dust

Fugitive dust migration from the site will be visually assessed by dust monitoring personnel and/or contractor personnel. If, during the course of the work, fugitive dust is observed migrating from the site, additional dust control measures will be implemented per Table 1 and Section 4.0 of the report.

General Dust Control Methods

The goal of this DMP is no visible dust. Based on the air monitoring results, visual observations of fugitive dust, and/or complaints of excessive dust generation by off-site parties, additional dust suppression measures may need to be implemented. Dust suppression measures could include, but are not limited to, the following:

- Wetting down soil improvement operations, visibly dry disturbed soil surface areas, and visibly dry disturbed unpaved driveways, parking areas, and staging areas to minimize or prevent dust from becoming airborne.
- Construction areas and roads will receive watering every two hours and at a minimum three times per eight hour shift during active operations or sufficiently often to keep the area adequately moisture conditioned. Moisture conditioning may be increased during above average temperatures, when dust generating activities intensify, or wind speeds increase.
- Covering stockpiles of excavated materials, backfill material, import material, gravel, sand, road base, and soil with polyethylene plastic sheeting, tarp, or other equivalent cover. Active stockpiles will be thoroughly wetted and excess material will be removed and/or consolidated regularly to limit the size and extent of the stockpile. The frequency of such activity will be adjusted based on weather and site conditions.
- If necessary, apply chemical dust suppressants consistent with manufacturer's directions and facilitate reapplication for non-active stockpiles.
- Using dust enclosures, dust curtains, plastic tarps, windbreaks, and dust collectors as necessary to control dust.
- Utilizing alternate work methods.
- Construction traffic on paved and unpaved roads, parking lots and staging areas will adhere to a maximum vehicle speed limit of ten (10) miles per hour (mph).

- Maintain a gravel or asphalt cover with a silt content that is less than five percent to a depth of three inches on the surfaces being used for travel.
- Paved roads within a construction site will be swept twice daily with a wet street sweeper during dust-generating activities.
- At least the first 500 feet of any public roadway exiting from the construction site will be swept twice daily during dust generating activities.
- Implementation of erosion control best management activities (BMPs) to control dust emissions from public roadways, parking areas, and any above grade unpaved staging areas or roadways.
- Construction workers will park on paved or graveled areas to reduce dust emissions.
- To the extent possible, heavy equipment will be left on the construction site and not staged outside the construction site to minimize potential for tracking soil off-site.
- Reduce vehicle trips via efficient trucking and equipment usage. Whenever possible, minimize equipment mobilization and demobilization.
- Utilize a rumble strip at all exits around the project area.
- Minimize drop heights while loading transportation vehicles.
- Use tarpaulins or other effective covers for trucks transporting soils.
- Wet sweeping or vacuuming paved streets, sidewalks, paths, and intersections where work is in progress.
- Sweeping the surrounding streets and sidewalks at least once per day during demolition, excavation, and construction so that dust is not allowed to leave the construction area.
- Installing wheel washers to clean all trucks and equipment leaving the site. In the case where wheel washers cannot be installed, brushing tires or tracks and spoil trucks off before they re-enter City streets to minimize deposition of dust-causing materials.
- Additional wetting will be required for weekends and end of workdays, should dust issues and complaints arise.
- Use of reclaimed water for dust control where applicable per San Francisco Health Code, Article 22B, Section 1242 (c)(11) and (14). Because construction dewatering discharge is anticipated to be authorized under the San Francisco Regional Water Quality Control's (Water Board) Order Number R2-2012-0012: Volatile Organic Compounds (VOCs) and Fuel General Permit, Langan will discuss the approval to use of reclaimed water with Randy Lee, the Water Board case worker.
- To reduce dust, dirt, or concrete fines from causing eye injuries during high winds, employees and onsite visitors will have proper eye protection and access to eye wash stations. The Cal/OSHA requirements for personal protection and safety will be established throughout the site.

Wind Monitoring and Requirements

Wind speeds will be documented using an on-site weather station. Wind speed data will be gathered by the on-site weather station and presented as daily or half-day average wind speeds.

The data shall be collected every 10 minutes, and an audible signal set to alarm if 20 mph winds or greater are detected. A written description and reference table will accompany the weekly reports documenting the implementation of dust control activities when 15, 20, and 25 mph wind speeds are recorded.

Wind Requirements

When wind speeds reach 20 miles per hour or greater over a ten minute time-weighted average; the contractor will increase dust control measures for 30 minutes to mitigate fugitive dust. Increased dust control measures will be documented in the field log and will be made available to the SFDPH upon request. If the increased dust control measures fail, that specific activity contributing to the dust generation shall cease. Work shall not commence, until the contractor can demonstrate adequate dust control activities at the site are effective due to changed conditions, or are no longer necessary.

The contractor will be responsible for implementing BMPs prior to winds reaching 20 mph. If wind speeds of 20 mph or greater are sustained for 30 minutes or longer dust generating activities will be ceased. Dust generating activities include, but are not limited to, excavation, grading, vehicular traffic, drilling, and equipment mobilization. The contractor will notify all subcontractors contributing to fugitive dust and instruct them to stop activity until wind speeds are below 20 mph for 30 minutes.

Table 2 from the DCP

Wind Speeds and Required Actions

Wind Speed	Required Actions
5 mph	Continue moisture conditioning of soil and street sweeping per this DMP.
10 mph	Increase frequency of moisture conditioning and street sweeping.
15 mph	Reduce vehicular traffic, cover stockpiles, and further increase moisture conditioning and street sweeping.
20 mph	Temporarily cease dust generating activity until wind speeds are recorded below 20 mph for 30 minutes or greater.

Project Signage

Signage will be posted at the site that will include the appropriate contractor contact information (i.e., telephone number) for interested parties to contact in case of complaints, such as excessive dust generation. Signage will be posted at a location that is visible from the public right-of-way. Onsite signage shall be in English, Spanish and the predominate language of construction workers on site. The signage shall include pertinent contact information of the project proponents and be clearly seen at a distance of 25 feet.

Based upon the submitted documentation, the Revised Dust Control Plan has been conditionally approved by EHB-SAM in September 2015. Review of the all the information

provided by the documents submitted to date, further documentation / investigation is warranted prior to conclusion of the Maher process.

1. The SMP mentions that it is the intent of the contractor to use a portable treatment unit (i.e. pug mill or rototiller) to treat contaminated soil. These methods have not been officially decided upon as stated by the consultant. When the owner and the general contractor have decided which remediation method will be most effective for the construction schedule; the appropriate permits as necessary shall be provided to this Department.

EHB-SAM requested that a Dust Control Plan addendum be submitted to address various sections as stated in the September 15, 2015 letter.

The goal of the Dust Control Plan is NO VISIBLE DUST. It is understood that soil disturbance and excavation activities produce dust, dust controls will be used to mitigate visible dust as it occurs. In the event that visible dust from soil disturbance or excavation is observed onsite, but does not cross the construction area boundary, the following procedures or comparable actions shall be followed. All activities listed herein, shall be addressed by the revised DMP.

A Revised Dust Control Plan was submitted in October 2015 to address EHB-SAM's concerns:

Section 3.4 – Sampling Frequency:

The dust monitors will be set up for the first week of each new, potential dust-generating activity conducted (e.g., one week of dust monitoring during demolition, one week of dust monitoring at the beginning of excavation). The dust monitors will run continuously five days a week 24-hours a day to assess dust conditions during work and non-work hours. If after one week the dust monitoring data collected during non-work hours are below the action level, monitoring will then monitor only during active dust generating activities. Dust monitoring personnel will check the monitoring equipment at the start of each work-day and at the conclusion of each work-day to ensure dust monitoring equipment is recording data accurately. Before the dust generating activities are shut down prior to the weekend a dust monitoring personnel will check that all stockpiles are covered and excavations are managed in accordance with dust control measures outlined in Section 4.0. Additionally, during times of dust generating activities, dust monitoring personnel will be present on-site for visual monitoring of field conditions and fugitive dust, to be available to manage complaints from the public, and consult with contractor personnel on suitable dust suppression measures. Dust monitoring personnel may check the site on weekends to assure that no fugitive dust is migrating from the site.

If a reading above any action levels as specified in Table 1 is recorded during the initial week of dust monitoring, dust monitoring will be extended for an additional week. Dust monitoring will continue until the appropriate dust suppression measures have been established for the given activity and an entire week with no readings above the dust action levels has occurred.

When dust monitoring is conducted during fog or precipitation the monitors will be covered to protect the equipment from damage. Given that fog or precipitation can falsely elevate readings, daily field reports will document weather conditions on site and weekly monitoring reports will summarize weather conditions that could have resulted in false readings.

Section 3.5 – Sampling Locations:

Four dust monitors will be placed at the site perimeter. Two dust monitors will be placed at upwind locations, and two dust monitors will be placed at downwind locations. Wind direction will be evaluated based on an onsite windsock or flag. Dust monitor locations will remain constant throughout project's dust generating activities. The dust monitor locations will be recorded in dedicated field logs (see Section 5.1).

Section 3.6: Action Levels and Corrective Actions:

The California Air Resources Board (CARB) has developed an ambient air quality standard for PM-10 of $50 \mu\text{g}/\text{m}^3$ averaged over a 24 hour period (CARB, 2012). In response to the SFDPH's *Dust Monitoring Plan Conditional Approval Letter* dated 15 September, 2015, a daily average will not be calculated. Instead an average over 30 minutes from perimeter monitoring equipment will be calculated. If the 30 minute TWA average exceeds $50 \mu\text{g}/\text{m}^3$, or the baseline dust condition, whichever is higher, additional dust control measures will be implemented per Table 1 and Section 4.0. The 30 minute TWA will be calculated 24 hours a day during active dust generating activities. Visual and/or remote alarms on the perimeter dust monitors will be set to trigger if the PM-10 level is exceeds $50 \mu\text{g}/\text{m}^3$. The action level of $50 \mu\text{g}/\text{m}^3$ may be negotiated with the SFDPH if the background dust monitoring results indicate a higher site background level. If the visual and/or remote alarms are triggered above the approved action level, additional dust control measures will be implemented per Table 1 and Section 4.0.

Table 1 (REVISED)
Action Levels and Required Actions

Dust Condition	Required Actions
PM-10 concentration exceeds 30 minute TWA of $50 \mu\text{g}/\text{m}^3$ (or to action level approved by SFDPH) or baseline dust conditions, whichever is higher	Particulate monitor triggers alarm. Review baseline dust conditions. Review work procedures. Implement additional dust control measures as needed to prevent future exceedances of the $50 \mu\text{g}/\text{m}^3$ daily average and/or minimize dust concentrations over the baseline dust conditions. Example additional dust control measures provided in Section 4.0.
Visible fugitive dust migrating off-site	Temporarily stop work and apply more aggressive dust control measures, per Section 4.0 or similar, until there are no visible dust clouds migrating off-site.
Neighbor complaints	Implement more aggressive dust control measures, per Section 4.0 or similar.

Section 4.0: General Dust Control Measures:

Dust suppression measures will be implemented by the contractor in accordance with Article 22B of the San Francisco Public Health Code (City and County of San Francisco, 2012), San Francisco Building Code Section 106A.3.2.6.3 (City and County of San Francisco, 2011), and in accordance with the SFPDPH comment letter dated 17 June 2015. The goal of this DMP is no visible dust. Based on the air monitoring results, visual observations of fugitive dust, and/or complaints of excessive dust generation by off-site parties, additional dust suppression measures may need to be implemented. Dust suppression measures could include, but are not limited to, the following:

- Wetting down soil improvement operations, visibly dry disturbed soil surface areas, and visibly dry disturbed unpaved driveways, parking areas, and staging areas to minimize or prevent dust from becoming airborne.
- Construction areas and roads will receive watering every two hours and at a minimum three times per eight hour shift during active operations or sufficiently often to keep the area adequately moisture conditioned.
- Moisture conditioning may be increased during above average temperatures, when dust generating activities intensify, or wind speeds increase.
- Covering stockpiles of excavated materials, backfill material, import material, gravel, sand, road base, and soil with polyethylene plastic sheeting, tarp, or other equivalent cover.
- Active stockpiles will be thoroughly wetted and excess material will be removed and/or consolidated regularly to limit the size and extent of the stockpile. The frequency of such activity will be adjusted based on weather and site conditions.
- If necessary, apply non-toxic chemical dust suppressants consistent with manufacturer's directions and facilitate reapplication for non-active stockpiles.
- Using dust enclosures, dust curtains, plastic tarps, windbreaks, and dust collectors as necessary to control dust.
- Utilizing alternate work methods.
- Construction traffic on paved and unpaved roads, parking lots and staging areas will adhere to a maximum vehicle speed limit of ten (10) miles per hour (mph).
- Maintain a gravel or asphalt cover with a silt content that is less than five percent to a depth of three inches on the surfaces being used for travel.
- Paved roads within a construction site will be swept twice daily with a wet street sweeper during dust-generating activities.

- At least the first 500 feet of any public roadway exiting from the construction site and the surrounding streets and sidewalks will be swept, via wet sweeping techniques, twice daily during dust generating activities.
- Implementation of erosion control best management activities (BMPs) to control dust emissions from public roadways, parking areas, and any above grade unpaved staging areas or roadways.
- Construction workers will park on paved or graveled areas to reduce dust emissions.
- To the extent possible, heavy equipment will be left on the construction site and not staged outside the construction site to minimize potential for tracking soil off-site.
- Reduce vehicle trips via efficient trucking and equipment usage. Whenever possible, minimize equipment mobilization and demobilization.
- Utilize a rumble strip at all exits around the project area.
- Minimize drop heights while loading transportation vehicles.
- Use tarpaulins or other effective covers for trucks transporting soils.
- Wet sweeping or vacuuming paved streets, sidewalks, paths, and intersections where work is in progress.
- Wet sweeping the surrounding streets and sidewalks at least once per day during demolition, excavation, and construction so that dust is not allowed to leave the construction area.
- Installing wheel washers to clean all trucks and equipment leaving the site. In the case where wheel washers cannot be installed, brushing tires or tracks and spoil trucks off before they re-enter City streets to minimize deposition of dust-causing materials.
- Additional wetting will be required for weekends and end of workdays, should dust issues and complaints arise.
- Use of reclaimed water for dust control where applicable per San Francisco Health Code, Article 22B, Section 1242 (c)(11) and (14). Because construction dewatering discharge is anticipated to be authorized under the San Francisco Regional Water Quality Control's (Water Board) Order Number R2-2012-0012: Volatile Organic Compounds (VOCs) and Fuel General Permit, Langan will discuss the approval to use of reclaimed water with Randy Lee, the Water Board case worker.
- To reduce dust, dirt, or concrete fines from causing eye injuries during high winds, employees and onsite visitors will have proper eye protection and access to eye wash

stations. The Cal/OSHA requirements for personal protection and safety will be established throughout the site.

Section 5.1: Wind Monitoring:

Per the *SFDPH SMP Approval Letter* dated 17 June 2015 additional wind monitoring will be conducted on site and dust control requirements will be enforced by the contractor in the event of increasing wind speeds.

5.1 Wind Monitoring

Wind speeds will be documented using an on-site weather station. Wind speed data will be gathered by the on-site weather station and presented as daily or half-day average wind speeds. The data shall be collected every 10 minutes, and an audible signal set to alarm if 20 mph winds or greater are detected. A written description and reference table will accompany the weekly reports documenting the implementation of dust control activities when 15, 20, and 25 mph wind speeds are recorded.

5.2 Wind Requirements

When wind speeds reach 20 miles per hour or greater over a ten minute TWA; the contractor will increase dust control measures for 30 minutes to mitigate fugitive dust. Increased dust control measures will be documented in the field log and will be made available to the SFDPH upon request. If the increased dust control measures fail, that specific activity contributing to the dust generation shall cease. Work shall not commence, until the contractor can demonstrate adequate dust control activities at the site are effective due to changed conditions, or are no longer necessary.

The contractor will be responsible for implementing BMPs prior to winds reaching 20 mph. If wind speeds of 20 mph or greater are sustained for 30 minutes or longer dust generating activities will be ceased. Dust generating activities include, but are not limited to, excavation, grading, vehicular traffic, drilling, and equipment mobilization. The contractor will notify all subcontractors contributing to fugitive dust and instruct them to stop activity until wind speeds are below 20 mph for 30 minutes.

The contractor will adhere to the required actions described in Table 2 below depending on the wind speed recorded at the on-site weather station.

Table 2 (REVISED)
Wind Speeds and Required Actions

Wind Speed	Required Actions
5 mph	Continue moisture conditioning of soil and wet street sweeping per this DMP.
10 mph	Increase frequency of moisture conditioning and wet street sweeping.
15 mph	Reduce vehicular traffic, cover stockpiles, and further increase moisture conditioning and wet street sweeping. At two consecutive intervals of an average wind speed of 15 mph over a 10 minute period, the foreman will walk the site to observe if visible dust is being generated. If visible dust

	is observed, more rigorous dust measures will be implemented per section 4.0.
20 mph	Temporarily cease dust generating activity to assess wind direction and speeds, and moisture condition area to be worked prior to resuming potential dust generating activities. At two consecutive intervals of an average wind speed of 20 mph over a 10 minute period, the foreman will implement more rigorous dust control measures. If additional dust suppression and mitigation measures are not sufficient to control visible dust, the dust generating activity will be discontinued until visible dust is adequately suppressed.
25 mph	At two consecutive intervals of an average wind speed of 25 mph over a 10 minute period, the dust generating activity will stop until wind speeds are sustained under an average of 25 mph for two consecutive 10 minute periods.

Section 6.2 – Signage:

Signage will be posted at the site that will include the appropriate contractor contact information (i.e., telephone number) for interested parties to contact in case of complaints, such as excessive dust generation. Signage will be posted at a location that is visible from the public right-of-way. Onsite signage shall be in English, Spanish and the predominate language of the neighboring area. The signage shall include pertinent contact information of the project proponents and be clearly seen at a distance of 25 feet from the perimeter fence line.

EHB-SAM finds that the Revised Dust Control Plan of October 2015 meets the SFHC Article 22B requirements.

Should you have any questions please contact Martita Lee M Weden, Sr. Environmental Health Inspector at (415) 252-3938 / martita.lee.m.weden@sfdph.org or Stephanie Cushing, Principal Environmental Health Inspector at (415) 252-3926 / stephanie.cushing@sfdph.org.

Sincerely,



Martita Lee M Weden, MS, CA USTI
Senior Environmental Health Inspector



Stephanie K.J. Cushing, MSPH, CHMM, REHS
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California Regional Water Quality Control Board

San Francisco Bay Region



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Gray Davis
Governor

Date: May 26, 1999
File: 38S0044
2223.06

Mr. Jim Adams
Catellus Development Corporation
201 Mission Street, 2nd Floor
San Francisco, CA 94105

Subject: Certificate of Completion
Mission Bay Project Area, San Francisco, California

Dear Mr. Adams:

Attached please find the Certificate of Completion for portions of the Redevelopment Areas North and South of China Basin Channel within the Mission Bay Project Area, San Francisco. There were no objections to the issuance of this certificate when it was presented to our Board at the May 25, 1999 Board Meeting.

Please contact Mr. Vic Pal at (510) 622-2403, e-mail vp@rb2.swrcb.ca.gov, if you have any questions regarding this matter.

Executive Officer

Steve Morse
Chief, Toxics Clean-Up Division

cc: see attached Distribution List

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN FRANCISCO BAY REGION

CERTIFICATE OF COMPLETION

Unified Agency Review of Hazardous Materials Release Sites
California Health and Safety Code §§ 25260-25268


The California Regional Water Quality Control Board, San Francisco Bay Region ("Regional Board"), was designated as the Administering Agency by the Site Designation Committee after a request by Catellus Development Corporation (the "Responsible Party") to oversee the Site Investigation and Remedial Action at portions of the Redevelopment Areas North and South of China Basin Channel within the Mission Bay Project Area, City and County of San Francisco, California, as designated in Resolution No. 98-044, attached as Exhibit "A" to this Certificate ("Site").

In accordance with Health and Safety Code § 25264, the Administering Agency, after appropriate consultation with other agencies, has determined and certifies that:

1. As indicated in Regional Board Resolution No. 98-044, the Administering Agency has determined that the investigation of the Site has been satisfactorily completed.
2. The Administering Agency has further reviewed and approved the May 11, 1999 Risk Management Plan ("RMP"), including its accompanying remedial action standards, remedial action objectives, and supporting documentation, and the Covenant and Environmental Restriction ("Covenant") for the Site, and has determined that Site remedial action standards and objectives and the Site permanent remedy will be accomplished by management of the Site in accordance with the RMP and Covenant. No further investigation or response action will be required at the Site other than the requirements of the RMP and Covenant. See May 12, 1999 letter from Stephen Morse, attached as Exhibit B, and May 12, 1999 memorandum from Steve Morse to Regional Board, attached as Exhibit C.
3. The Responsible Party has complied with the requirements of all state and local laws, ordinances, regulations, and standards that are applicable to the Site investigation and remedial action.
4. The above determinations and this Certificate apply only to those areas of the Site which are both: (i) enrolled by the Site Designation Committee in the AB 2061 program, and (ii) are within the geographic scope of property covered by the RMP and the Covenant(s). Any property within the Mission Bay Development Area which is included in the area covered by the RMP and the Covenant, and which, subsequent to the effective date of this Certificate, is enrolled in the AB 2061 program, shall be thereafter included as part of the "Site" for purposes of the determinations and benefits of this Certificate.
5. The above determinations and this Certificate do not apply to any investigation and remediation requirements for petroleum hydrocarbons located in the area covered by Order 98-028. The requirements for such petroleum hydrocarbons may be the subject of a separate Certificate when their remedial action has been completed.
6. This Certificate of Completion is further subject to conditions specified in Exhibit D.

Therefore, no agency may take action against a Responsible Party at the Site with respect to the hazardous materials releases except as provided in this Certificate or as specified in Health and Safety Code § 25264(c) (1) through (6).

Issued this 25 day of May, 1999
by the Administering Agency


Loretta K. Barsamian
Executive Officer

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

RESOLUTION No. 98-044

Adoption of a Resolution Concurring With Health and Safety Code Chapter 6.65 (AB 2061) Consultative Workgroup's Agreement That Site Investigation is Complete and Proposed Conceptual Plan for Management of Site is Satisfactory for the Catellus Development Corporation's Mission Bay Redevelopment, North and South of China Basin Channel, City and County of San Francisco

WHEREAS, the California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Board), finds that:

- 1. Project and Site Description:** Catellus Development Corporation (Catellus), is proposing a mixed-use redevelopment for the approximately 238 acre South of China Basin Channel and the approximately 65 acre area North of China Basin Channel to include multi-family housing, public and private open space, retail, commercial and entertainment uses, a hotel, a police and fire station, and office, biotech and research and development facilities. Additionally, approximately 43 acres within the South of Channel Area will be transferred to the University of California for an additional campus and several other parcels will be transferred to the City of San Francisco for various municipal uses. Daycare centers may be located in each of the major land use districts and it is anticipated that a single site could be developed as a school, most likely a primary school.

The Mission Bay areas were formerly used for warehousing, railroad yard operations, and many other commercial and industrial uses over the past 100 years. Much of the area is random fill pushed into the Bay till early in this century. Concerns were raised whether this formerly industrial and commercial land contained subsurface residual chemicals of concern in the soil and groundwater that would present risks to human health if the site was redeveloped as well as to the nearby San Francisco Bay. Although groundwater can be extracted from much of the site, due to the random fill and adjacent Bay the groundwater quality is low and quantity is marginal. There are no known drinking water uses, either existing or potential, of the groundwater on the Mission Bay site.

- 2. AB 2061 Delegation to Regional Board:** Assembly Bill (AB) 2061 amended the Health and Safety Code (HSC) [added Chapter 6.65 to Division 20] to allow a Responsible Party who agrees to carry out a site investigation and remedial action to request designation by the Site Designation Committee of the California Environmental Protection Agency of an "Administering Agency" or "Lead Agency", to oversee investigation and cleanup. The Lead Agency's role is to streamline the site investigation and remedial action process. In July 1997, the Site Designation Committee approved the Catellus request to designate the San Francisco Bay Regional Water Quality Control Board ("Board") as the Lead Agency for the Mission Bay project. This decision was unopposed and was primarily based upon the site information provided in Catellus' request, the Board's long-time lead on the project under an

**San Francisco Bay Regional Water Quality Control Board
Resolution No. 98-044**

earlier agreement, and the site's proximity to the Bay. Under AB 2061, the Board is supported in its oversight of the Mission Bay project by Support Agencies. In this instance the Support Agencies are primarily the Department of Toxic Substances Control (DTSC), and the San Francisco Department of Public Health (DPH). Other environmental regulatory agencies (e.g. Bay Area Air Quality Management District, etc.) are also invited to participate, and do, when items of concern affect their area of expertise. The environmental regulatory agencies are also part of a Consultative Workgroup under AB 2061 and advise the Board and Board staff as necessary on their areas of expertise and regulatory authority.

3. **Investigation and Reports:** Catellus, through its consultant, ENVIRON, has completed its investigation of the Mission Bay project and produced several technical reports explaining the field investigations, conclusions and recommendations for both North of the Channel and South of the Channel (*Site Investigation and Risk Evaluation Reports Volumes 1-5, dated February 4, 1998, the Technical Memorandums 1-4, dated April 8, 1998, and Investigation and Results, Mission Bay North of Channel, dated April 22, 1997*). Impacts on water quality, public health, and the environment were evaluated within the context of the proposed use of Mission Bay.
4. **Investigation Results :** ENVIRON's studies of the Mission Bay Project Area found:
 - The principal chemicals detected were petroleum hydrocarbons associated with the site use and metals associated with fill materials at the Site
 - No high VOC concentrations were found in soils or groundwater
 - No significant source area for metals were detected in soil or groundwater other than the fill material at the Site that was placed at the turn of the century
 - No concentration of any chemical posed a threat to human health or the aquatic ecosystem following the completion of the planned development except one petroleum free product area
 - The area where petroleum free product was delineated was east of Illinois Street near 16th Street (an area now being addressed under RWQCB Order 98-028 by a group of oil companies that formerly operated in that area)
5. **Board Staff and Consultative Workgroup Agrees with Catellus' Investigation and Findings:** Excluding the petroleum free product plume covered by RWQCB Order 98-028, Board staff and the Consultative Workgroup at a meeting April 28, 1998, agreed with ENVIRON's findings and conclusions from their investigations that the presence of residual chemicals in soil and groundwater at the North of China Basin Channel and South of China Basin Channel Sites pose a manageable risk to water quality, public health, and the environment; do not require further site cleanup at this time; and that a Certificate of Completion is warranted *provided* the following four operating and institutional conditions are met to assure that water quality, public health and the environment are protected from existing and potential residual risks:
 - Submittal of an acceptable Risk Management Plan(s) describing (1) specific methods and procedures for managing Site soil before, during, and following site construction,

**San Francisco Bay Regional Water Quality Control Board
Resolution No. 98-044**

(2) guidelines for acceptable environmental provisions in Health and Safety Plans, and (3) a framework for coordinating Article 20 compliance with other parts of the Risk Management Plan(s)

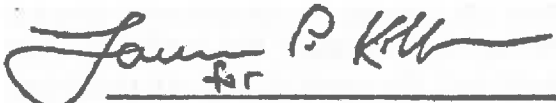
- Submittal of an enforceable institutional mechanism(s) or deed restriction(s) restricting owner or operator parcel usage to uses appropriate for the human health risk calculations conducted (e.g., no shallow wells for drinking water, health and safety practices applicable to the installation and maintenance of utilities, etc.)

At such time as Catellus satisfactorily completes the above conditions a Certificate of Completion will be issued for all parts of the Mission Bay Project Area other than that area containing free phase petroleum product subject to Order 98-028. The Certificate of Completion for the free phase petroleum covered under Order 98-028 will be issued for that area when the remedial action for that area has been completed.

6. **CEQA:** This resolution enforces the laws and regulations administered by the Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency Guidelines.
7. **Public Notice:** The Board provided notice of its intention to consider this matter at the May 20, 1998, Board meeting and provided an opportunity for interested persons to comment on the draft resolution and its attachments.
8. **Public Hearing:** The Board, at a public meeting, heard and considered all comments pertaining to this resolution.

NOW, THEREFORE BE IT RESOLVED, that the Board concurs with the staff and Consultative Workgroups' findings and recommendations and hereby acknowledges that the site investigation is complete and that the proposed conceptual plan for management of the site is satisfactory for the Mission Bay Redevelopment Area North and South of China Basin Channel within the Mission Bay Project Area, City and County of San Francisco.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on May 20, 1998.



Loretta K. Barsamian
Executive Officer



California Regional Water Quality Control Board

San Francisco Bay Region



Justin H. Hickox
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Gray Davis
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Mr. Jim Adams
Catellus Development Corporation
201 Mission Street, 2nd Floor
San Francisco, CA 94105

Date: May 12, 1999
File: 38S0044
2223.06

EXHIBIT B

Subject: Approval of Risk Management Plan and Covenant and Environmental Restriction
Mission Bay Project Area, San Francisco, California

Dear Mr. Adams:

Regional Board Staff have reviewed ENVIRON's "Risk Management Plan for the Mission Bay Project Area, San Francisco, California," dated May 11, 1999 and its accompanying documentation ("RMP"), as well as reviewed and provided comments on previous drafts over the last ninety days. Accompanying the RMP is a "Covenant and Environmental Restriction on Property (Covenant)," prepared by Catellus Development Corporation, The Regents of the University of California, and the City and County of San Francisco (including the San Francisco Port Commission). The Covenant has also been submitted for review and comment in numerous versions, the most recent of which was finalized on May 7, 1999. Board Staff have received comments on both the RMP and the Covenant from the San Francisco BayKeeper, the San Francisco Redevelopment Agency, Mission Bay Citizen's Advisory Committee-Toxics Subcommittee, and the Department of Toxic Substances Control.

The RMP is based upon results of extensive environmental investigations and human health and ecological risk analyses conducted since 1996. The RMP identifies specific risk management measures that must be implemented prior to, during, and after development of each parcel within the Mission Bay Area. The RMP and Covenant are based upon the anticipated mixed-use development for the Mission Bay Project Area. The RMP measures will be enforced through the Covenant and other means.

Based on this information, Regional Board Staff approve the May 11, 1999 Risk Management Plan and the Covenant and Environmental Restriction as submitted on May 7, 1999. Please contact Mr. Vic Pal at (510) 622-2403, e-mail vp@rb2.swrcb.ca.gov if you have any questions regarding this matter.

Sincerely,

Loretta Barsamian
Executive Officer

Steve Morse
Chief, Toxics Clean-Up Division

cc: see attached Distribution List

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MEMORANDUM

TO: Loretta Barsamian
Executive Officer

FROM: Vic Pal, WRCE
Toxics Cleanup Division

DATE: May 12, 1999

SUBJECT: Evaluation of and Recommendations on the Certificate of Completion for the Redevelopment Areas North and South of China Basin Channel within the Mission Bay Project Area, City and County of San Francisco



John E. Kaiser
Section Leader



Stephen Morse
Division Chief

At the request of Catellus Development Corporation ("Catellus"), in July 1997, the Board was designated as the Administering Agency under AB 2061 to oversee implementation of a remedy in the Mission Bay North and Mission Bay South Redevelopment Areas (the "Site"). As required by AB 2061, the Administering Agency must, when the remedy is implemented, issue a Certificate of Completion. The Certificate will be issued for that portion of the Site that is covered by both the approved Risk Management Plan (described in more detail below) and that is enrolled in AB 2061 program, which overlapping area is depicted in Exhibit E (the "Certificate of Completion Area"). The AB 2061 Area includes most but not all of the Mission Bay North and Mission Bay South Redevelopment Areas.

In May 1998, in Resolution 98-044, the Board determined that the investigation of the Site was satisfactorily completed with the exception of the petroleum free product related to the former petroleum bulk storage facilities and associated pipelines now being addressed by several oil companies under Board Order 98-028. Resolution 98-044 concluded that a Certificate of Completion could be issued upon approval of two documents: (a) a Risk Management Plan describing specific methods and procedures for managing soil onsite, guidelines for an acceptable environmental provisions for Health and Safety Plans, and a framework for coordinating Article 20 compliance with other parts of the Risk Management Plan, and (b) the submittal of an enforceable institutional mechanism or deed restriction restricting owner or operator parcel usage to uses appropriate for the human health risk calculations conducted.

The Board has completed its review of the May 11, 1999 Risk Management Plan, Mission Bay, San Francisco, California ("RMP") and the Covenant and Environmental Restriction on Property ("Covenant") submitted for Site. This review began in 1998, and

SUBJECT: Evaluation of and Recommendations on the Certificate of Completion for the Redevelopment Areas North and South of China Basin Channel within the Mission Bay Project Area, City and County of San Francisco

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has proceeded intensively during the last 90 days. The process of developing the RMP included numerous meetings with various stakeholders for the project, including Baykeeper and the entire Mission Bay Citizens Advisory Committee Toxics Subcommittee at least twice. This review process has also involved close coordination with the other state agencies involved in the AB 2061 program, most notably the California Department of Toxic Substances Control ("DTSC"). After review, the Board staff has approved the RMP (and its accompanying supporting technical documentation) and the Covenant. The Board staff has determined that the environmental condition at the Site, with the exception of the petroleum hydrocarbon remediation related to the former petroleum bulk storage facilities and associated pipelines in the area covered by Board Order 98-044, can be appropriately managed without further investigation or remediation by the measures set forth in the RMP and the Covenant. DTSC concurs with these determinations. Accordingly, the staff believes that it is appropriate that the Board Executive Officer issue, on behalf of the Administering Agency under the AB 2061 program, a Certificate of Completion [in the form identified in Appendix A] under Health & Safety Code Section 25264 for the Certificate of Completion Area with certain specified conditions.

This staff report summarizes our understanding of the environmental conditions at the Site and the measures being implemented as the remedy.

EXECUTIVE SUMMARY- Mission Bay Site

The City and County of San Francisco (the "City"), the Port Commission of San Francisco, the Regents of the University of California ("The Regents") and Catellus currently own most of the land in Mission Bay North and Mission Bay South. The plan anticipates a mixed-use development of approximately 300 acres in two Redevelopment Areas, Mission Bay North and Mission Bay South including multi-family housing (including both market rate and affordable, rental and for-sale units); public open space; retail and commercial uses; a hotel; a police and fire station; and office, biotech and research and development facilities. In addition, a total of approximately 43 acres within the South of Channel Area will be transferred to The Regents for construction of an additional campus. Various land transfers among Catellus, the City of San Francisco (including the San Francisco Port) and the State Lands Commission will occur to effectuate the planned development.

The Investigations

Subsurface investigations were conducted to assess whether chemicals of concern were present at the Site, whether the presence of those chemicals pose risks to human health and the ecological environment, and how their presence might impact future Site development and use. See *Site Investigation and Risk Evaluation Report, Mission Bay*

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South of Channel (ENVIRON 1998); *Results of Investigation, Mission Bay North* (ENVIRON 1997). A more in-depth discussion of these investigations can be found in the April 10, 1998 Memorandum to Loretta Barsamian. Board staff determined based on the results of these investigations, the Site (with the single exception of the petroleum hydrocarbons related to the former petroleum bulk storage facilities and associated pipelines located in the area covered by Order 98-028 described below) does not require additional investigation and/or remediation. Existing concentrations of chemicals found in soil and ground water can be readily managed through the use of a RMP and Covenant.

Petroleum Free Product Area

Based on observations made during ENVIRON's drilling and sampling activities, a free product area of measurable thickness was identified in the southeast portion of the South of Channel Area along and adjacent to 16th Street, east of Illinois Street. The nature and extent of the free product was observed and documented during the South of Channel Investigation and during a 1990 investigation (ENSR 1990), and the presence of the free product was attributed to the former petroleum bulk storage, pipelines and transfer facilities previously located on Port and Esprit property, as well as the underground petroleum pipelines used by these and other facilities that run beneath Sixteenth Street to Pier 64. In April 1998, the Board issued Order 98-028 to the five oil companies determined to be responsible for the petroleum free product.

Since submitting a *Work Plan for Site Assessment In the Vicinity of Pier 64, San Francisco* (PEG, November 11, 1997) in November 1997 to assess the extent of the free product, the oil companies completed numerous phases of investigation to delineate the extent of the free product and develop remedial alternatives. The results of that *Work Plan* were presented in a June 1998 report. Measurable free product thicknesses have been observed in approximately 10 piezometers or monitoring wells up to a thickness of 1.6 feet in one monitoring well. The results of the analysis on the petroleum free product suggest a wide range of aged and weathered hydrocarbon products including gasoline, diesel, fuel oil, and lubricating oil. In the August 13, 1998 *Interim Remedial Action Work Plan* (Pacific Environmental Group), the oil companies proposed draining, cutting, and capping the underground petroleum pipelines running from Pier 64 to Illinois Street and manually recovering separate phase free product from certain monitoring wells. These actions were taken as interim actions while a final Plan was being developed. The results of the interim remedial actions were presented in *Technical Report Interim Remedial Actions* (PEG, January 8, 1999). Sample locations installed by the oil companies in the free product area since May 1998 have better delineated the extent of free product in the subsurface. The results of these additional phases of investigation will be incorporated into the selection of permanent remedial alternatives in the *Remedial Action Plan* now proposed for submittal to the Board at the end of May. Accordingly, it is not appropriate to issue a Certificate of Completion for the petroleum hydrocarbons related to the former petroleum bulk storage facilities and associated pipelines located in the area covered by

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Order 98-028 at this point in time. When an agreed upon remedy is in place, the Board staff will re-assess this determination and will advise the Board concerning the issuance of a Certificate of Completion.

The Risk Management Plan

In order to properly manage chemicals that have been detected within the AB 2061 Area before, during, and after development, appropriate protective site management measures will be implemented for the entire area. On May 12, 1999, Board staff approved the Risk Management Plan, Mission Bay Area, San Francisco, California, dated May 11, 1999 (RMP) for the portion of the Site identified in the RMP ("RMP Area"). Although the RMP Area is slightly larger than the AB 2061 Area, approval of the RMP for this larger area merely acknowledges that the management measures specified are appropriate for that larger area. It does not affect the amount of land included in the AB 2061 program nor the land for which a Certificate may be granted. The RMP presents the decision framework and specific protocols for managing the chemicals in the soil and ground water in a manner that is protective of human health and the ecological environment, consistent with the existing and planned future land uses, and compatible with long term phased development. The RMP addresses risk management measures prior to commencement of development activities, measures to be taken during development and construction, and measures to be taken after development is complete. Among the many measures required, the RMP spells out the oversight, reporting and enforcement obligations of parties. The completion of development of the RMP Area will result in a complete cover being constructed over the existing soils, in the form of buildings, roads, pavement and landscaping.

The RMP was prepared by ENVIRON in consultation with the City and County of San Francisco (the "City"), the San Francisco Redevelopment Agency ("Agency"), the Regents, Catellus and the Department of Toxic Substances Control ("DTSC"). Drafts of the RMP were submitted to Baykeeper, the Mission Bay Citizens Advisory Committee Toxics Subcommittee and the Alliance for a Clean Waterfront ("Alliance"). The Alliance is a coalition of community and environmental groups including Communities for a Better Environment, the Coalition for Better Wastewater Solutions, the Southeast Alliance for Environmental Justice, the Sierra Club and the Golden Gate Audubon Society, among others. Board staff met numerous times with various representatives of these groups, provided the opportunity for comment and provided written responses to written comments. In addition, Board staff met extensively with ENVIRON, the City, the Agency, and the Regents. As Administering Agency, Board staff held an advisory committee meeting with the oversight agencies, the Consultative Workgroup ("CWG") under the AB 2061 program and granted approval of the RMP on May 12, 1999 (Exhibit B).

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The RMP will govern the entire RMP Area during three overlapping time periods: the time period prior to development, the time period during development and the time period after development is complete, where development means the construction of new buildings, roads, infrastructure, landscaping, driveways, regrading, paving or the demolition of existing buildings when such activities will disturb soils existing currently in Mission Bay or will contact the ground water.

The following is a brief summary and explanation of the types of measures required by the RMP. It is not possible to identify every measure here, and the summary below is provided for the convenience of the Board alone; it is not a substitute for reading and understanding the RMP in its entirety.

RMP: Prior to Development

The risk management measures that must be implemented on each parcel within the RMP Area prior to development of the parcel are designed to restrict unauthorized access to and contact with the existing soils and ground water in the RMP Area until development of a parcel begins. These interim risk management measures were developed, in part, based on an analysis of the potential human health risks posed by the exposed soils that currently exist on parcels within the RMP Area. The measures required by the RMP prior to development include the installation of fencing and gates to restrict unauthorized access to existing exposed soils, installation of fences on parcels that become vacant prior to when development occurs, notification of tenants in the RMP Area of RMP requirements, and quarterly inspections of parcels to ensure the measures remain in place. In addition, any subsurface repair work occurring prior to development and the management of soil stockpiles must be conducted in accordance with the appropriate provisions. Finally, this section describes limitations on specified interim uses that may occur on an area with exposed existing soils in the RMP Area prior to development, absent written approval from Board staff. Various stakeholders and the Board staff are discussing general dust control measures unrelated to hazardous materials that may independently apply to the RMP Area prior to development. The outcome of those discussions may be confirmed in documents separate from the RMP.

RMP: During Development

Management measures for the time period occurring during development and construction were developed following the identification and analysis of each potential impact. Based on the types of constituents detected in the existing soils and ground water, management measures were designed to control the following potential impacts: dust generation from the activities described above; off-site transport of soils as sediments through surface water run-off from exposed soil stockpiles and graded areas; the inadvertent creation of horizontal conduits from utility trenches; movement of soils during construction; and unknown subsurface structures and unknown areas of

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contamination identified during development and dewatering activities. Specific dust control measures are identified, as are the circumstances under which they must be implemented in order to comply with BAAQMD rules and regulations. In addition, a Dust Plan was designed to verify the long-term average off-site dust levels remain below health-based levels. Hossain Kazemi of the Field Response Team for Storm Water has coordinated efforts to ensure that the RMP storm water provisions are proactive and appropriate. Off-site runoff will be controlled by the development of a conceptual Storm Water Pollution Prevention Plan (SWPPP) to be submitted to Board staff 120 days from May 12, 1999. Subsequently, each construction site of one acre or more will be required to develop a site-specific SWPPP. Environmental health and safety measures are implemented through a mandatory Environment Health and Safety Plan, detailed minimum standards for which are spelled out in the RMP.

In addition, measures during construction address unauthorized access to sites during development, set out monitoring and reporting requirements and require that the soil be analyzed for hazardous wastes prior to the issuance of a building permit in accordance with the detailed procedures set out in Appendix F of the RMP, which recites the City's Ordinance Requirements for Analyzing the Soil for Hazardous Wastes (formerly all contained in Article 20). Specific additional measures are required within the area known to be impacted by petroleum free product. The section also sets forth the process for selecting and obtaining approval for locating a daycare center and/or school.

RMP: After Development Is Complete

Long-term risk management measures that will be implemented at each parcel after the development is complete are designed to manage and maintain the cover, consisting of buildings, streets and landscaped areas. The measures require that, after development is complete, all existing soils must be covered by buildings, parking lots, roads, sidewalks or landscaping with between 1.0 and 1.5 feet of fill, either imported or otherwise approved by the Board. Single family homes with private front or back yards are prohibited during future development of the parcels within the RMP Area. Areas designated for nonresidential uses may not be used for residences without conducting further risk assessment analysis and changing applicable land use plans. Ground water within the RMP Area may not be used for domestic, industrial or irrigation purposes and ground water wells may only be installed for environmental remediation, environmental monitoring or dewatering purposes. The RWQCB retains authority to grant approval of ground water use in the future. Any future subsurface activities must be conducted in accordance with the measures required during development. Finally, long-term monitoring is required to confirm that these measures are followed.

Covenant and Environmental Restriction on Property

A deed restriction, in the form of a Covenant and Environmental Restriction on Property

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("Covenant") sets forth the requirements that will attach to the Site, upon recordation of the Covenant and which will then run with the land, for the benefit of the Board and the Covenantor, under Civil Code section 1471. This Covenant was developed through a collaborative process involving the City, the Regents, Catellus, DTSC, the State Water Resources Control Board and the Board. The Board and the Covenantor are entitled to enforce the Covenant. Under the Covenant, all Owners and Occupants, as defined, during their respective periods of ownership or occupancy must implement and comply with each and every applicable requirement of the RMP, as it may be amended. In addition, the Covenant prohibits use of ground water for domestic, industrial or irrigation purposes unless the Board expressly approves such use following a supplemental risk assessment. Ground water wells, other than for environmental remediation approved by the Board, environmental monitoring purposes, or dewatering, are otherwise prohibited. The Covenant provides the Board with reasonable access to the Site for purposes of monitoring, inspecting, surveilling or maintenance in connection with the Covenant. The Covenant gives the Board grounds for filing suit against an Owner or Occupant for its breach of the Covenant, and thus for failing to comply with the RMP. The Certificate of Completion does not grant immunity from suit for an entity not in compliance with the RMP or Covenant. In addition, future land purchase agreements and leases will be required to have a statement identifying the existence of the Covenant and an Owner must provide all Transferees with a copy of the RMP.

Certificate of Completion

The Certificate of Completion ("Certificate"), that has been approved as to form and content by the CWG, states that no further investigation or response action will be required in the AB 2061 Area other than the requirements of the RMP and Covenant. In accordance with Health and Safety Code § 25264, the Certificate states that Catellus, as the Responsible Party, has complied with the requirements of all state and local laws, ordinances, regulations, and standards that are applicable to the AB 2061 Area investigation and remedial action. Once issued, the Certificate bars all agency actions against the Responsible Party with respect to these hazardous materials releases, except as specified in Health and Safety Code §§ 25264(c)(1) through (6). These determinations and the Certificate itself only apply to those areas of the Site that are within the AB 2061 Area; that is, areas both (i) enrolled in the AB 2061 program, and (ii) are within the geographic scope of property covered by the RMP and the Covenant(s). The conditions attached to the Certificate include mandatory compliance with the RMP conditions and the recorded Covenant. Particular conditions are attached with respect to compliance for existing tenants.

Conclusions

We conclude that implementation of and compliance with the RMP along with recordation of the Covenant will be satisfactory to manage any risks that may be

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presented to water quality, human health or the ecological environment by chemicals that exist in the soils and ground water at the Site, excluding the petroleum hydrocarbons present in the area covered by RWQCB Order 98-028.

Recommendations

Excluding the petroleum hydrocarbons covered by RWQCB Order 98-028, Board staff and the CWG agreed that the RMP is sufficient to manage any risks that may be presented to water quality, human health or the ecological environment by chemicals that exist in the soils and ground water in the AB 2061 Area. In addition, the CWG agrees that the Covenant will be an appropriate institutional measure through which to enforce the RMP. These tasks were completed in accordance with Resolution 98-044. Thus, when the Covenant or Covenants are recorded by Catellus, the City, The Regents or other owners of property within the AB 2061 Area, the Regional Board Executive Officer will issue to that owner a Certificate of Completion under Health & Safety Code Section 25264 on behalf of the Administering Agency, in the form identified in Appendix A.

Exhibit D

Conditions to the Certificate of Completion

1. The Certificate shall take effect as to any portion of the Site upon the recording, against that portion of the Site, of a deed restriction in the form of the Covenant and Environmental Restriction on Property ("Covenant"), which has been previously approved by the Administering Agency as one that is enforceable and that limits Site usage before, during and following development as provided in the approved Risk Management Plan ("RMP").

2. Any Site owner, exclusive occupant, or other entity claiming the benefits of the Certificate must comply with the conditions of the RMP and the recorded Covenant applicable to its activities on the Site.

3. The determinations of this Certificate shall be suspended as to any subparcel of the Site occupied by an exclusive occupant holding possession pursuant to a lease existing as of the effective date of the Covenant where (a) the occupant is out of compliance with the RMP or Covenant, (b) the occupant refuses to comply with the RMP or Covenant because the lease predated such documents, and (c) the Site owner does not seek or is unsuccessful in obtaining a final judicial determination of enforceability of such documents against such exclusive occupant and the owner does not otherwise cause the subparcel to come into compliance with the RMP or Covenant. In such circumstances for any subparcel, the Regional Board may seek to compel further investigation or remedial measures (other than those specified in the RMP) for such subparcel pursuant to applicable state law as an alternative means to achieve the human health risk and ecological goals and concerns set forth in the RMP and supporting documentation previously approved by the Regional Board. Any such occupant or owner affected by such suspensions of the determinations of the Certificate for that subparcel will be given an opportunity to agree to comply with the terms of the RMP and Covenant before further remediation is ordered to protect public health and the environment, and, if such compliance occurs, the determinations of the Certificate shall be reinstated as to that sub-parcel.

4. As the applicant for the enrollment of the Site in the AB2061 program under Chapter 6.65 of the Health & Safety Code, Catellus Development Corporation is the Responsible Party for the Site. The City and County of San Francisco ("the City") and The Regents of the University of California ("The Regents") are each current owners of a portion of the Site and will in 1999 exchange some of their properties. After that transfer, each will continue to be an owner of a portion of the Site and will be bound under the Covenant to comply with applicable portions of the Risk Management Plan on those properties. Upon the 1999 land transfers and accompanying recording of the Covenant, the City and The Regents will (in addition to Catellus) be entitled to the protections granted to a responsible party under Health and Safety Code Section 25264(c) for the Site.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

ORDER No. R2-2014-0022

RESCISSION OF SITE CLEANUP REQUIREMENTS (ORDER No. R2-2005-0028) for:

**ATLANTIC RICHFIELD COMPANY,
CHEVRON U.S.A. INC.,
PHILLIPS PETROLEUM COMPANY,
TEXACO INC.,
UNION OIL COMPANY OF CALIFORNIA,
CITY AND COUNTY OF SAN FRANCISCO, and
ECOR-SF HOLDINGS, INC. (formerly known as ESPRIT DE CORP.)**

for the former petroleum terminals and related pipelines located at:

**PIER 64 AND VICINITY
CITY AND COUNTY OF SAN FRANCISCO**

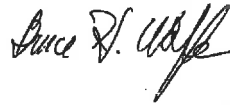
The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter the Regional Water Board), finds that:

1. **Regional Water Board Orders:** The Regional Water Board adopted site cleanup requirements (Order No. R2-2005-0028) for the Pier 64 site on June 15, 2005 (Order). The Order named Atlantic Richfield Company, Chevron U.S.A. Inc., Phillips Petroleum Company, Texaco Inc., Union Oil Company of California, the City and County of San Francisco, and Ecor-SF Holdings, Inc. (hereinafter collectively called the dischargers) as responsible parties.
2. **Summary of Investigation and Remediation Activities:** As part of the larger 303-acre Mission Bay Redevelopment Area in the City and County of San Francisco, the 12-acre Pier 64 site was the historical location of various bulk petroleum storage and transfer facilities, with releases that impacted soil and groundwater. The Order required the implementation of a November 19, 2004, Remedial Action Plan (RAP) proposed by Atlantic Richfield Company, Chevron U.S.A. Inc., Texaco Inc., and Union Oil Company of California (collectively the Pier 64 Group) to address the existence of separate phase petroleum hydrocarbons products at the site along the 16th Street pipeline corridor and under the majority of the footprint of the two former petroleum bulk storage facilities on both sides of 16th Street (i.e., Parcels 3892-01 and 3940-01) as well as their immediate surrounding and downgradient areas.
3. **Basis for Rescission:** A subset of the dischargers (the Pier 64 Group) has completed all the tasks as set forth in the Order. Consistent with the approved RAP, approximately 200,000 tons of impacted soil were disposed of offsite. Additionally, more than 15,000 feet of petroleum pipelines were either removed or grouted in place. Post-remediation

groundwater monitoring has shown that the residual petroleum products have very limited impact on the groundwater beneath the site. Current groundwater conditions have met the Regional Water Board's Environmental Screening Levels. Any residual contamination poses acceptable risks to human health and the environment that can be effectively managed using the existing Mission Bay Area Risk Management Plan.

4. **CEQA:** This action rescinds an order to enforce the laws and regulations administered by the Regional Water Board. Rescission of the Order is not a project as defined in the California Environmental Quality Act (CEQA). There is no possibility that the activity in question may have a significant effect on the environment. (California Code of Regulations, Title 14, §§ 15378 and 15061, subd. (b) (3).)
5. **Notification:** The Regional Water Board has notified the discharger and all interested agencies and persons of its intent under Water Code section 13304 to rescind site cleanup requirements for the discharge, and has provided them with an opportunity to submit their written comments.

IT IS HEREBY ORDERED, pursuant to section 13304 of the Water Code, that Order No. R2-2005-0028 is rescinded.



Digitally signed by Bruce H. Wolfe
DN: cn=Bruce H. Wolfe,
o=SWRCB, ou=Region 2,
email=bwolfe@waterboards.ca.
gov, c=US
Date: 2014.06.05 12:16:16 -07'00'

Bruce H. Wolfe
Executive Officer

APPENDIX F

Ordinance Requirements for Analyzing the Soil for Hazardous Wastes

SAN FRANCISCO PUBLIC WORKS CODE
ARTICLE 20
ANALYZING THE SOIL FOR HAZARDOUS WASTES

SEC. 1001 ANALYSIS REQUIRED.

- (a) Applicants for any building permit shall comply with the requirements of (Section 1002) Article 22A of the San Francisco Public Health Code when:
1. The permit is for a construction project that involves the disturbance of at least 50 cubic yards of soil; and
 2. The parcel of land or part thereof on which the construction or part thereof will occur is located
 - (A) Bayward of the high-tide line as indicated on the Historic San Francisco Maps, prepared by the State of California, State Lands Commission, State Lands Division and filed with the Recorder of the City and County of San Francisco pursuant to Chapter 1333 of the 1968 Statutes, as amended by the California Legislature, for reference in conjunction with the map and description of lands, situated in the City and County of San Francisco, that were transferred to the City and County of San Francisco under Chapter 1333. The Director of Public Health shall prepare and maintain for public distribution a map that reflects this line.
 - (B) In any area of the City and County of San Francisco designated by the Director of Public Health pursuant to Section (1008) 1232 of the Health Code.
- (b) The Director may waive the requirements imposed by this Section if the applicant demonstrates that the property has been continuously zoned as residential under the City Planning Code since 1921, has been in residential use since that time, and the Director has no other reason to believe that the soil may contain hazardous wastes.
- (c) Notwithstanding the provisions of Subsection (a), the Director has authority to require soil analysis pursuant to the provisions of this Article as part of any building permit

application when the Director has reason to believe that hazardous wastes may be present in the soil at the construction site.))

SEC. 1004. PERMIT APPROVAL.

- (a) Except for site permits issued pursuant to San Francisco Building Code Section 303(g), once the Director of Public Health has determined that the required site history, soil sampling and analyses were conducted and the report contains the information required by Section 1003, the Director of Public Works may approve or disapprove the application subject to the terms and limitations of this Section. The Director of Public Works may issue a site permit pursuant to San Francisco Building Code Section 303(g) prior to the time an applicant complies with this Article, provided, however, that the Director of Public Works shall not issue any addenda pursuant to Building Code Section 303(g), except addenda necessary to carry out the soil sampling or site mitigation measures required by this Article, until the applicant has complied with all applicable provisions of this Article. The holder of a site permit and any addenda necessary to comply with this Article shall proceed with approved addenda work at his own risk, without assurance that approvals for the remaining addenda or for the entire building will be granted.
- (a) If the soil sampling and analysis report indicates that there are no hazardous wastes present in the soil, the Director of Public Health shall provide the applicant and the Director of Public Works with written notification that the applicant has complied with the requirements of this Article. The Director of Public Works may thereafter approve or disapprove the building permit application.
- (b) If the soil sampling and analysis report indicates that the site is listed on the National Priorities List or the list of hazardous substances release sites published by the California Department of Health Services, the project applicant shall provide to the Director of Public Health certification or verification from the appropriate federal or state agency that any site mitigation required by the federal or state agency has been completed and complete the -certification procedure set forth in Section 1005. After receipt of the certification required by Section 1005, the Director of Public Health shall provide the applicant and the Director of Public Works with written notification that the applicant has

complied with the requirements of this Article. Thereafter, the Director of Public Works may approve or disapprove a building permit.

- (c) Unless Subsection (b) is applicable, if the soil sampling and analysis report indicates that hazardous wastes are present in the soil, the applicant shall do the following before the Director of Public Works may approve or disapprove the building permit application:

1. Submit a site mitigation report prepared by a qualified person to the Director of Public Works and the Director of Public Health.
 - A. For the purposes of this Section, a qualified person is defined as one or more of the following who is registered or certified by the State of California: soil engineer, civil engineer, chemical engineer, engineering geologist, geologist, hydrogeologist, Industrial hygienist or environmental assessor.
 - B. The site mitigation report shall contain the following information:
 - i. A determination by the qualified person as to whether the hazardous wastes in the soil are causing or are likely to cause significant environmental or health and safety risks, and if so, recommended measures that will mitigate the significant environmental or health and safety risks caused or likely to be caused by the presence of the hazardous waste in the soil. If the report recommends mitigation measures it shall identify any soil sampling and analysis that it recommends the project applicant conduct following completion of the mitigation measures to verify that mitigation is complete.
 - ii. A statement signed by the person who prepared the report certifying that the person is a qualified person within the meaning of this Section and that in his or her judgment either no mitigation is required or the mitigation measures identified, if completed, will mitigate the significant environmental or health and safety risks caused by or likely to be caused by the hazardous wastes in the soil.

2. Complete the site mitigation measures identified by the qualified person in the site mitigation report. The Director of Public Works may issue any permits or addenda to site permits necessary for the applicant to carry out the site mitigation measures; and
 3. Complete the certification procedure set forth in Section 1005. After receipt of the certification required by Section 1005, the Director of Public Health shall provide the applicant and the Director of Public Works with written notification that the applicant has complied with the requirements of this Article.
- (d) For the purposes of completing the requirements of this Article, the time limitations set forth in Section 303(a)1.B. of the San Francisco Building Code do not apply.

SAN FRANCISCO HEALTH CODE
ARTICLE 22A
ANALYZING SOILS FOR HAZARDOUS WASTE

SEC. 1220. DEFINITIONS.

In addition to the general definitions applicable to this Code, whenever used in this Article, the following terms shall have the meanings set forth below:

- (a) "Applicant" means a person applying for any building permit as specified by Section 106.1 of the San Francisco Building Code.
- (b) "Certified laboratory" means a laboratory certified by the California Department of Health Services, pursuant to the provisions of Section 25198 of the California Health and Safety Code, for analyzing samples for the presence of hazardous waste.
- (c) "Director" means the Director of the San Francisco Department of Public Health or the Director's designee.
- (d) "Director of Building Inspection" means the Director of the Department of Building Inspection of the City and County of San Francisco.
- (e) "Hazardous waste" means any substance that meets the definition of hazardous waste in Section 25117 of the California Health and Safety Code or Appendix X of Division 4.5, Chapter 10, Article 5 of Title 22 California Administrative Code.

SEC. 1221. APPLICABILITY OF ARTICLE.

Pursuant to Section 1001 of the San Francisco Public Works Code, an Applicant shall comply with this Article.

SEC. 1222. WAIVER OF REQUIREMENTS FOR COMPLIANCE.

Director may waive the requirements imposed by this Article if the Applicant demonstrates that the property has been continuously zoned as residential under the City Planning Code since 1921, has been in residential use since that time, and no evidence has been presented to create a reasonable belief that the soil may contain hazardous wastes. The Director shall provide the

Applicant and the Director of Building inspection with written notification that the requirements of this Article have been waived.

SEC. 1223. DIRECTOR'S DISCRETIONARY AUTHORITY TO REQUIRE COMPLIANCE.

In addition to those areas defined pursuant to Section 1221, the Director has authority to require soil analysis pursuant to the provisions of this Article as part of any building permit application when the Director has reason to believe that hazardous wastes may be present in the soil at the property.

SEC. 1224. SITE HISTORY.

The Applicant shall provide to the Director a site history for the property prepared by an individual with the requisite training and experience described in regulations adopted pursuant to Section 1232, The site history shall contain a statement indicating whether the property is listed on the National Priorities List, published by the United States Environmental Protection Agency pursuant to the federal Comprehensive Environmental Response Compensation and Liability Act, 42 U.S.C. Section 9604(c)(3) or listed as a hazardous substance release site by the California Department of Toxic Substances Control or the State Water Resources Control Board pursuant to the California Hazardous Substances Account Act, Health and Safety Code Section 25356. The applicant shall file the site history with the Director and the certified laboratory.

SEC. 1225. SOIL SAMPLING AND ANALYSIS.

(a) Analysis of Sampled Soil. The Applicant shall cause a professional geologist, civil engineer, or engineering geologist who is registered or certified by the State of California, or a certified laboratory to take samples of the soil on the property to determine the presence of hazardous wastes in the soil. The following types of analyses shall be conducted, unless an alternative proposal is approved by the Director:

- (1) inorganic persistent and bioaccumulative toxic substances as listed in Section 66261.24(a)(2)(A) of Title 22 of the California Administrative Code;

- (2) volatile organic toxic pollutants as listed in 40 Code of Federal Regulations, 122, Appendix D, Table II;
 - (3) PCBs;
 - (4) pH levels;
 - (5) cyanides;
 - (6) methane and other flammable gases;
 - (7) total petroleum hydrocarbons;
 - (8) semi-volatile compounds;
 - (9) hazardous wastes designated by the Director pursuant to Section 1232 and;
 - (10) any other hazardous waste that either the Director or the certified laboratory, after an examination of the site history, has reason to conclude may be present on, the property. The Director shall make any such determination within 30 days of filing by the applicant of the site history.
- (b) Procedures for Soil Sampling. Soil sampling shall be conducted in accordance with procedures for sampling soils approved by the California Department of Toxic Substances Control or the State Water Resources Control Board and the San Francisco Bay Regional Water Quality Control Board.
- (c) Testing of Sampled Soil. Samples shall be analyzed by a certified laboratory in accordance with methods for analyzing samples for the presence of hazardous wastes approved by the California Department of Toxic Substances Control or the State Water Resources Control Board and the San Francisco Bay Regional Water Quality Control Board.

SEC. 1226. SOIL ANALYSIS REPORT.

- (a) Contents. The Applicant shall submit a soil analysis report prepared by the persons conducting the soil sampling and analysis to the Director, the California Department of Toxic Substances Control, the San Francisco Bay Regional Water Quality Control Board and to other agencies as directed by the Director. The report shall include the following information:

- (1) The names and addresses of the persons and the certified laboratory that conducted the soil sampling, the soil analysis and prepared the report;
 - (2) An explanation of the sampling and testing methodology;
 - (3) The results of the soil analyses;
 - (4) Whether any of the analyses conducted indicate the presence of hazardous wastes and, for each, the level detected and the state and federal minimum standards, if any;
 - (5) The state and federal agencies to which the presence of the hazardous wastes has been reported and the date of the report;
 - (6) A statement that the certified laboratory, after examination of the site history, has no reason to conclude that hazardous wastes other than those listed in Section 1225(a)(1) through (a)(9) were likely to be present on the property;
- (b) Review by Director. The Director shall determine whether the site history, soil sampling and analyses required by this Article were conducted and whether the report required by this Section is complete. If the site history, soil sampling or analyses were not conducted or the report does not comply with the requirements of this Section, the Director shall notify the applicant in writing within 30 days of receipt of the report, indicating the reasons the report is unacceptable. A copy of the notification shall be sent to the Director of Building Inspection.
- (c) No Wastes Present. If the soil sampling and analysis report indicates that there are no hazardous wastes present in the soil, the Director shall provide the Applicant and the Director of Building Inspection with written notification that the Applicant has complied with the requirements of this Article.

SEC. 1227. KNOWN HAZARDOUS WASTE SITE.

If the soil sampling and analysis report or site history indicates that the property is listed on the National Priorities List or the list of California Hazardous Substances Account Act release sites, the Applicant shall provide to the Director certification or verification from the appropriate federal or state agency that any site mitigation required by the federal or state agency has been completed and complete the certification procedure set forth in Section 1229. Certification by a

competent state or federal agency that mitigation measures have been properly completed shall constitute a conclusive determination and shall be binding upon the Director.

SEC. 1228. APPLICANT'S RESPONSIBILITY UPON DISCOVERY OF HAZARDOUS WASTES.

Unless Section 1227 is applicable, if the soil sampling and analysis report indicates that hazardous wastes are present in the soil, the Applicant shall submit a site mitigation report prepared by a qualified person to the Director.

- (a) For the purposes of this section, a qualified person is defined as one or more of the following who is registered or certified by the State of California: soil engineer, civil engineer, chemical engineer, engineering geologist, geologist, hydrologist, industrial hygienist or environmental assessor.
- (b) The site mitigation report shall contain the following information:
 - (1) A determination by the qualified person as to whether the hazardous wastes in the soil are causing or are likely to cause significant environmental or health and safety risks, and if so, recommend measures that will mitigate the significant environmental or health and safety risks caused or likely to be caused by the presence of the hazardous waste in the soil. If the report recommends mitigation measures it shall identify any soil sampling and analysis that it recommends the project applicant conduct following completion of the mitigation measures to verify that mitigation is complete.
 - (2) A statement signed by the person who prepared the report certifying that the person is a qualified person within the meaning of this section and that in his or her judgment either no mitigation is required or the mitigation measures identified, if completed, will mitigate the significant environmental or health and safety risks caused by or likely to be caused by the hazardous wastes in the soil.
 - (3) Complete the site mitigation measures identified by the qualified person in the site mitigation report; and
 - (4) Complete the certification required by Section 1229.

SEC. 1229. CERTIFICATION.

- (a) Contents. The Applicant shall certify under penalty of perjury to the Director that:
- (1) If Section 1227 is applicable, the Applicant has received certification or verification from the appropriate state or federal agency that mitigation is complete.
 - (2) If Section 1228 Is applicable:
 - (A) A qualified person has determined in the site mitigation report that no hazardous wastes in the soil are causing or are likely to cause significant environmental or health and safety risks, and the qualified person recommends no mitigation measures; or
 - (B) The Applicant has performed all mitigation measures recommended in the site mitigation report, and has verified that mitigation is complete by conducting follow-up soil sampling and analysis, if recommended in the site mitigation report.
- (b) Applicant Declarations. The certification shall state:
- "The Applicant recognizes that it has a nondelegable duty to perform site mitigation; that it, and not the City, is responsible for site mitigation: that it, not the City, attests to and is responsible for the accuracy the representations made in the certification, and that it will continue to remain liable and responsible, to the extent such liability or responsibility is imposed by state and federal law, for its failure to perform the site mitigation."**

SEC. 1230. NOTIFICATION TO DIRECTOR OF BUILDING INSPECTION.

After receipt of the certification required by Section 1229, the Director shall provide the Applicant and the Director of Building Inspection with written notification that the Applicant has complied with the requirements of this Article.

SEC. 1231. MAINTENANCE OF REPORT BY DIRECTOR.

The site history, soil analysis report certification and related documents shall become a part of the file maintained by the Department.

SEC. 1232. RULES AND REGULATIONS.

- (a) Adoption of Rules. The Director may adopt, and may thereafter amend, rules, regulations and guidelines that the Director deems necessary to implement the provisions of this ordinance. For the purposes of this Article, a public hearing before the Health Commission shall be held prior to the adoption or any amendment of the rules, regulations and guidelines recommended for implementation. In addition to notices required by law, the Director shall send written notice, at least 15 days prior to the hearing, to any interested party who sends a written request to the Director for notice of hearings related to the adoption of rules, regulations and guidelines pursuant to this Section.

In developing such regulations, the Director shall consider, inter alia, state and federal statutes and regulations pertaining to hazardous wastes with the purpose of coordinating local regulations with them.

- (b) Guidelines for Regulations. Rules, regulations and guidelines may address among others, the following subjects:
- (1) Minimum standards for acceptable site histories. The minimum standards shall be designed to assist interested persons including, but not limited to, the Director of Building inspection, other state and local public agencies and certified testing laboratories, to evaluate whether analyses, other than those required by Section 1225(a)(1) through (a)(9), must be conducted to detect the presence in the soil of hazardous wastes and to determine what analyses are appropriate.
 - (2) Minimum education and experience requirements for the persons who prepare site histories pursuant to Section 1224. In making this determination, the Director shall consider relevant those academic disciplines and practical experience which would qualify an individual to evaluate a property in San Francisco and identify prior uses made of the property that may be relevant in determining whether there are hazardous wastes in the soil and what analyses, if any, are appropriate to identify them.

- (3) Precautionary measures to minimize long-term exposure to hazardous wastes that cannot be removed or are not required to be removed by the site mitigation plan.
- (4) Designation of areas. Designation of areas in the City, in addition to the area described in Section 1001 of the San Francisco Public Works Code, where the Director has reason to believe that the soils may contain hazardous wastes and the designation of the analyses specified in Section 1225 that shall be conducted in each area.
- (5) Designation of additional hazardous wastes. The designation of additional hazardous wastes, other than those listed in Section 1225(a)(1) through (a)(9), for which analyses must be conducted. The designation shall be based on a determination by the Director that there is a reasonable basis to conclude that such other hazardous wastes may be in the soil. The designation may be made applicable to a specified area or areas of the City or city-wide as determined by the Director.
- (5) Waiver from Requirements for Analyses. The exclusion of hazardous wastes from the analysis requirements set forth in Section 1225 upon a determination that the hazardous waste does not pose a significant present or potential hazard to human health and safety or to the environment.

SEC. 1233. NOTIFICATION TO BUYER.

The Director shall prepare and maintain to, public distribution a summary of the requirements of this Article. The seller or the seller's agent involved in the sale or exchange of any real property located bayward of the high-tide line as indicated on the Historic San Francisco Maps as described in Article 20 of the Public Works Code and as reflected on the map prepared and maintained for public distribution by the Director and in those areas designated by the Director pursuant to section 1223 shall provide a copy of the summary to the buyer or buyers and shall obtain a written receipt from the buyer or buyers acknowledging receipt of the summary. Failure to give notice as required by this section shall not excuse or exempt the buyer of the property from compliance with the requirements of this Article.

SEC. 1234 NONASSUMPTION OF LIABILITY.

In undertaking to require certain building or grading permits to include soil analyses for the presence of hazardous wastes, the City and County of San Francisco is assuming an undertaking only to promote the general welfare. It is not assuming, nor is it imposing on itself or on its officers and employees, any obligation for breach of which it is liable for money damages to any person who claims that such breach proximately caused injury.

SEC. 1235. CONSTRUCTION ON CITY PROPERTY.

All departments, boards, commissions and agencies of the City and County of San Francisco that authorize construction or improvements on land under their jurisdiction under circumstances where no building or grading permit needs to be obtained pursuant to the San Francisco Building Code shall adopt rules and regulations to insure that the same site history, soil sampling, analyzing, reporting, site mitigation and certification procedures as set forth in this Article are followed. The Directors of Public Health and Building Inspection shall assist the departments, boards, commissions and agencies to insure that these requirements are met.

SEC. 1236. SEVERABILITY.

If any section, subsection, subdivision, paragraph, sentence, clause or phrase of this Article or any part thereof, is for any reason to be held unconstitutional or invalid or ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Section or any part thereof. The Board of Supervisors hereby declares that it would have passed each section, subsection, subdivision, paragraph, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, subdivisions, paragraphs, sentences, clauses or phrases be declared unconstitutional or invalid or ineffective.

SEC. 1237. FEES.

The Director is authorized to charge the following fees to defray the costs of document processing and review, consultation with applicants, and administration of this Article: (1) an initial fee of \$390, payable to the Department, upon filing a site history report with the Department; and (2) an additional fee of \$130 per hour for document processing and review and

applicant consultation exceeding three hours or portion thereof, payable to the Department, upon filing of the certification required pursuant to Section 1229.