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# **SITE MITIGATION PLAN**

## **GOLDEN STATE WARRIORS ARENA,**

### **Blocks 29-32, Mission Bay**

### **San Francisco, California**

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**SITE MITIGATION PLAN**  
**Golden State Warriors Arena**  
**Blocks 29-32, Mission Bay**  
**San Francisco, California**

## **1.0 INTRODUCTION**

This Site Mitigation Plan (SMP) was prepared to support the proposed development of the Golden State Warriors Arena construction project located at Blocks 29 through 32, Mission Bay, San Francisco, California (Figure 1). The site is bounded by South Street on the north, Sixteenth Street on the south, Third Street on the west, and Terry A. Francois Boulevard on the east. The Site has dimensions of approximately 770 by 620 feet and is currently occupied by an asphalt paved parking lot and undeveloped land surrounded by a chain link fence.

The site is within the Maher zone of San Francisco (bayward of the historic 1852 high tide line). Construction projects within the Maher zone that disturb more than 50 cubic yards of soil require that the site history, soil, groundwater, and soil gas quality of the material that will be encountered during construction be assessed in accordance with Article 22A of the Maher Ordinance. Previous investigations of properties within the Maher zone in Mission Bay have found fill material containing elevated levels of certain metals and petroleum hydrocarbons associated with 1906 earthquake and resulting fire. Langan's *Phase II Environmental Site Assessment, Golden State Warriors Arena, Mission Bay, San Francisco, California* (Phase II ESA) dated 2 June 2015, documented that heavy metals (chromium, nickel, and lead) were detected in soil above State of California hazardous waste thresholds. Therefore, site mitigation and health and safety procedures are required during construction to minimize worker, public and future site occupant exposure to the hazardous materials. These procedures are outlined in this SMP and a Health and Safety Plan (HASP) prepared by others and will be implemented during construction.

This SMP presents the measures recommended to mitigate potential risks to the environment and to protect construction workers, nearby residents, workers and/or pedestrians from potential exposure to hazardous substances and underground structures that may be encountered during soil excavation and grading activities.

## **2.0 PROJECT DESCRIPTION**

### **2.1 Proposed Development**

According to the design plans, and Basement Slab and Pile Cap Overview dated March 2015 provided by Manusson Klemencic Associates (MKA), the proposed development will consist of three main areas that are shown on Figure 2 and described below. 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 this 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.

Design excavation depths are shown on Figure 2. The below grade structures will be designed to prevent groundwater infiltration and therefore long-term dewatering will not be required.

### **2.2 Site Conditions**

Originally, the site was below sea level 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 (Rumsey, 2003) and documents (ESA, 1990) 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 3<sup>rd</sup> Street; this structure was a timber pile-supported bridge that crossed Mission Bay from north to south.

The 10.9 acre site (Figure 1) 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 above mean sea level (Mission Bay Datum)<sup>1</sup>. There is a depressed area in the southern portion where an excavation was performed for an environmental cleanup and partially backfilled as shown on Figure 2 (BBL, 2005).

### **2.3 Geologic and Hydrogeologic Setting**

Langan and others have completed previous geotechnical and environmental investigations at the site. 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 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 Colma 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.

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<sup>1</sup> All elevations reference San Francisco City Datum plus 100 feet.

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 16<sup>th</sup> 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.

## **2.4 Current Regulatory Oversight**

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. On 26 May 1999, the Water Board provided a Certificate of Completion for the RMP prepared by Environ. The letter stated that no further investigation or response action will be required within Mission Bay other than the requirements of the RMP, and Covenant and Environmental Restrictions.

On 15 May 2001, the Water Board reiterated its role as the administering agency regarding management of methane at the Mission Bay area. In that letter, the Water Board stated that they are the administering (lead) agency, as designated by the California Environmental Protection Agency (CalEPA). 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.

### **3.0 PREVIOUS ENVIRONMENTAL INVESTIGATION, REMEDIATION AND REPORTS**

Past activities within the Pier 64 area (generally defined as an area north and south of the 16<sup>th</sup> Street corridor from the bay margin and extending to 3<sup>rd</sup> Street), 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. This Order set forth the final site cleanup requirements and redefined the Pier 64 area into six Operable Units (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 the 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). A summary of the remedial actions conducted is discussed below.

#### UST Removals

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. The areas around the former USTs were subsequently over-excavated during the remedial activities conducted by BBL (discussed below).

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 (Environ, 2004) as shown on Figure 2. 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; the findings of these investigations were summarized in the RMP (Environ, 1999). 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.

Pier 64 Area - Phase I Remedial Excavation in 2001

The Phase I remedial action was implemented by Clayton in 2001 (Clayton, 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), the extent of the soil excavation is presented on Figure 2. 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. The 2001 Phase I remedial excavation area is shown on Figure 2.

Pier 64 Area - Phase II Remedial Excavation in 2005

A Phase II remedial action was completed within the Pier 64 OUs, including portions of the site, in 2005 through 2006 (BBL, 2006b). 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 Phase II remedial excavation is shown on Figure 2. 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 (BBL, 2006b). 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 in and around the general vicinity of the OUs (BBL, 2006b). The GMP was comprised of approximately 20 active monitoring wells for the Pier 64 area. The Water Board approved ARCADIS' 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 (Strata, 2010) 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. Based on these findings, an additional investigation was not recommended over and above the Maher sampling described herein (Langan, 2014).

### Langan Phase I ESA Update, April 2014

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.

### Langan Phase II ESA December 2014 & January 2015

The Phase II ESA was prepared to support the proposed development of the Warriors Arena and to satisfy the requirements of Article 22A (Maher Ordinance). To classify and delineate hazardous material that is planned for excavation and disposal, and to characterize groundwater that will be discharged during construction dewatering, Langan completed soil and groundwater sampling in December of 2014, soil sampling in January of 2015, and a second round of groundwater sampling in March of 2015. The details of these soil and groundwater sampling activities are presented in the Phase II ESA. The Phase II ESA soil and groundwater sample

location map and analytical data tables are attached as Figure 1 and Tables 1 through 5 in Appendix A.

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 (Table 3, Appendix A). 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 are shown on Figure 3 and will be disposed of off-site at a Class I non-RCRA regulated landfill. The current developer is also exploring soil treatment options (discussed in Section 4.2.1) to treat the Class I California hazardous soil to 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 (Figure 4). 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 discussed in Section 2.1, TPHmo and TPHd were detected at concentrations ranging between 800 mg/kg and 1,800 mg/kg. The elevated TPH concentrations are likely associated with the historical fuel bulk storage and distribution terminal. A few volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were detected at low concentrations would not be a health concern to construction workers.

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.

#### **4.0 SITE MITIGATION MEASURES**

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.

#### **4.1 Health and Safety Measures**

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.

##### 4.1.1 Health and Safety Plan

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.

The purpose of the HASP is to provide field personnel with an understanding of the potential chemical and physical hazards, protection of any off-site receptors, procedures for entering the project site, H&S procedures, and emergency response to hazards should they occur. 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.

##### 4.1.2 Health and Safety Officer

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.

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).

## **4.2   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.

#### 4.2.1 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. 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 (Figure 4). 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 mil 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.

#### 4.2.2 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. Soil profiling criteria will ultimately depend on the acceptance criteria of the facilities receiving the soil. These procedures will be established by the excavation contractor and coordinated with the proposed facilities prior to initiating soil excavation.

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 (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. These two systems will be used to comply with appropriate state and local requirements. All manifest and bills of lading will be maintained in the project files by the contractor during the excavation activities and made available to Langan on request.

The contractor will arrange for transportation of all wastes off-site. The excavated material will be transported to the appropriate disposal facility using a permitted, licensed, and insured transportation company. Transporters of hazardous waste must meet the requirements of 40 CFR 263 and 22 CCR 66263 and be listed in the Department of Toxic Substances Control (DTSC) Hazardous Waste Haulers database. All trucks transporting bulk hazardous waste will be properly and covered with compatible materials.

Soil exported off-site that is characterized as a hazardous waste, will require an appropriate USEPA Generator Identification Number which will be recorded on the hazardous waste manifests used to document transport of hazardous waste off-site. The hazardous waste transporter, disposal facility, and U.S. Department of Transportation (DOT) waste description required for each manifest will be determined on a case-by-case basis. A description of the

number of containers being shipped, the type of container, and the total quantity of waste being shipped will also be included on each manifest.

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 (Section 3.7).

#### 4.2.3 Soil Sampling

If needed, chemical testing of the stockpiled soil will be performed to profile the soil for disposal. Soil profiling criteria depends on the proposed landfill location or the receiving facility. These procedures shall be established by the excavation contractor and coordinated with the proposed landfills prior to initiating soil excavation. Typical soil profiling requirements for landfills are one four-point composite sample per 500 to 750 cubic yards to be disposed. The samples will be analyzed for analyses typically required by regulated landfills and if the soil is not planned for disposal at a regulated landfill, the soil profiling analysis will generally follow the guidelines established by DTSC *Information Advisory Clean Imported Fill Material*.

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.

#### **4.4 Dust Control**

Prior to initiating construction activities, a dust control plan will be implemented by the contractor to reduce potential exposure during excavation and loading operations to comply with Article 22B of the San Francisco Public Health Code. This document will contain measures to protect construction workers and the public including: dust control measures and work stoppage provisions that will be followed during construction activities.

Dust control will be accomplished through implementation of best management practices, engineering controls, including those identified under Section 4.1.2. Misting or spraying will be

performed to sufficiently reduce fugitive dust emissions, but limited to prevent water runoff. Efforts will also be made to minimize the soil drop height from an excavator's bucket onto soil piles or into transport trucks.

A detailed Dust Monitoring Plan (DMP) will be completed by Langan in a separate report and will outline dust monitoring procedures to be implemented during potential dust generating activities. The plan will, at a minimum, specify:

- Conditions when real-time dust monitoring is required.
- The dust monitoring equipment to be used, as well as the minimum detection limit and equipment calibration requirements.
- Monitoring frequency and locations.
- Reporting requirements.
- Dust threshold levels and proposed corrective action responses.

The DMP will be submitted to the SFDPH for review and approval.

#### **4.5 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.

#### **4.6 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.

#### **4.7 Closure Report**

A Closure Report will be prepared by Langan upon completion of soil handling activities. This report will present a chronology of the construction events, a summary of analytical data, bills of lading, manifests, weight tickets, and certificates of treatment/disposal for soil and a description of all mitigation conducted. It will also include a certification statement that indicates the mitigation activities have been performed in accordance with this SMP.

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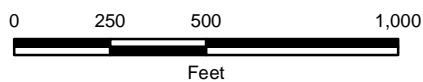
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## **FIGURES**



**Notes:**

1. Aerial orthophoto mosaic is courtesy of the City and County of San Francisco and is from April 2012.
2. Map displayed in California State Plane Coordinate System, Zone III, North American Datum of 1983 (NAD83), US Survey Feet.



**GOLDEN STATE WARRIORS ARENA**  
San Francisco, California

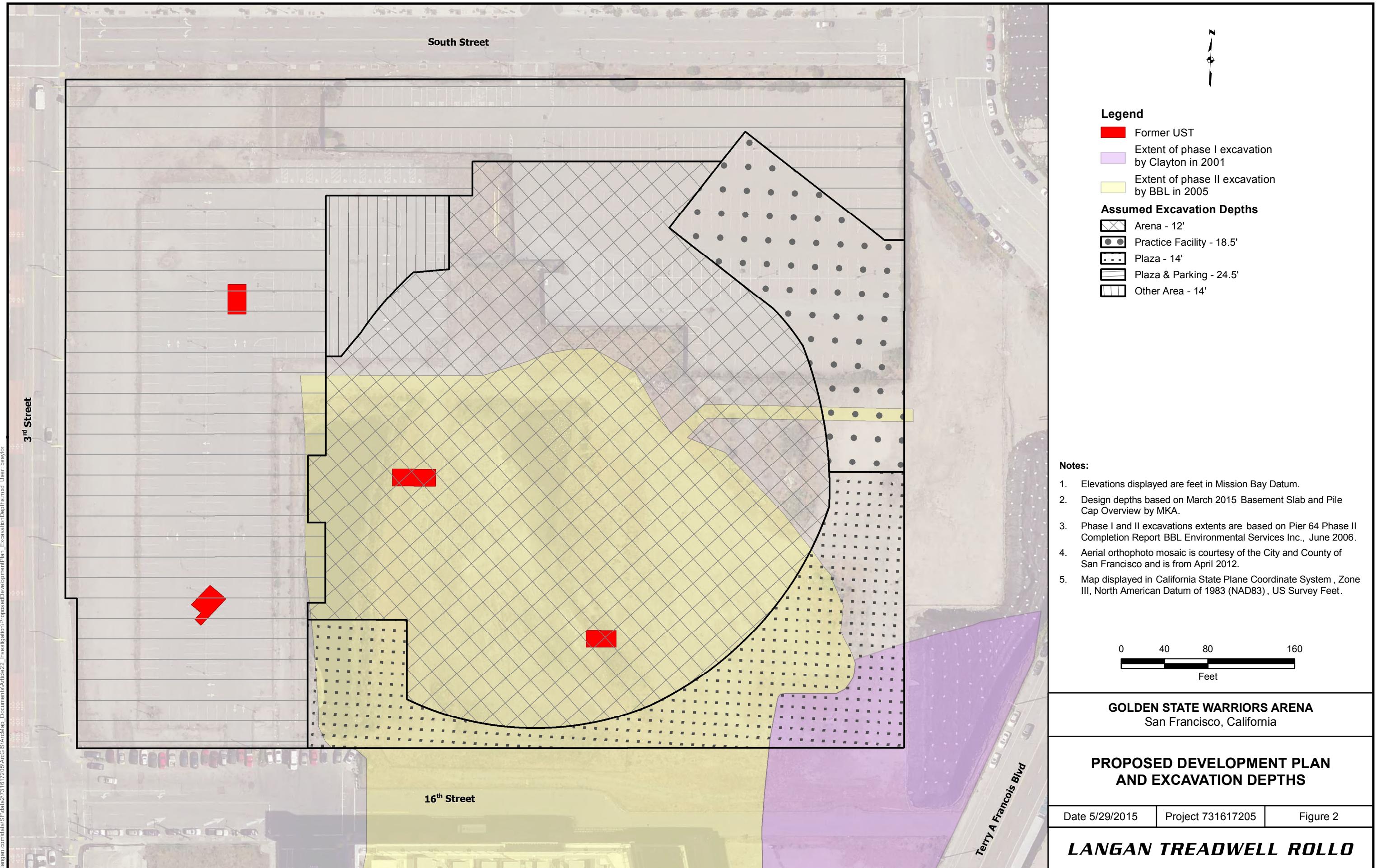
**SITE LOCATION**

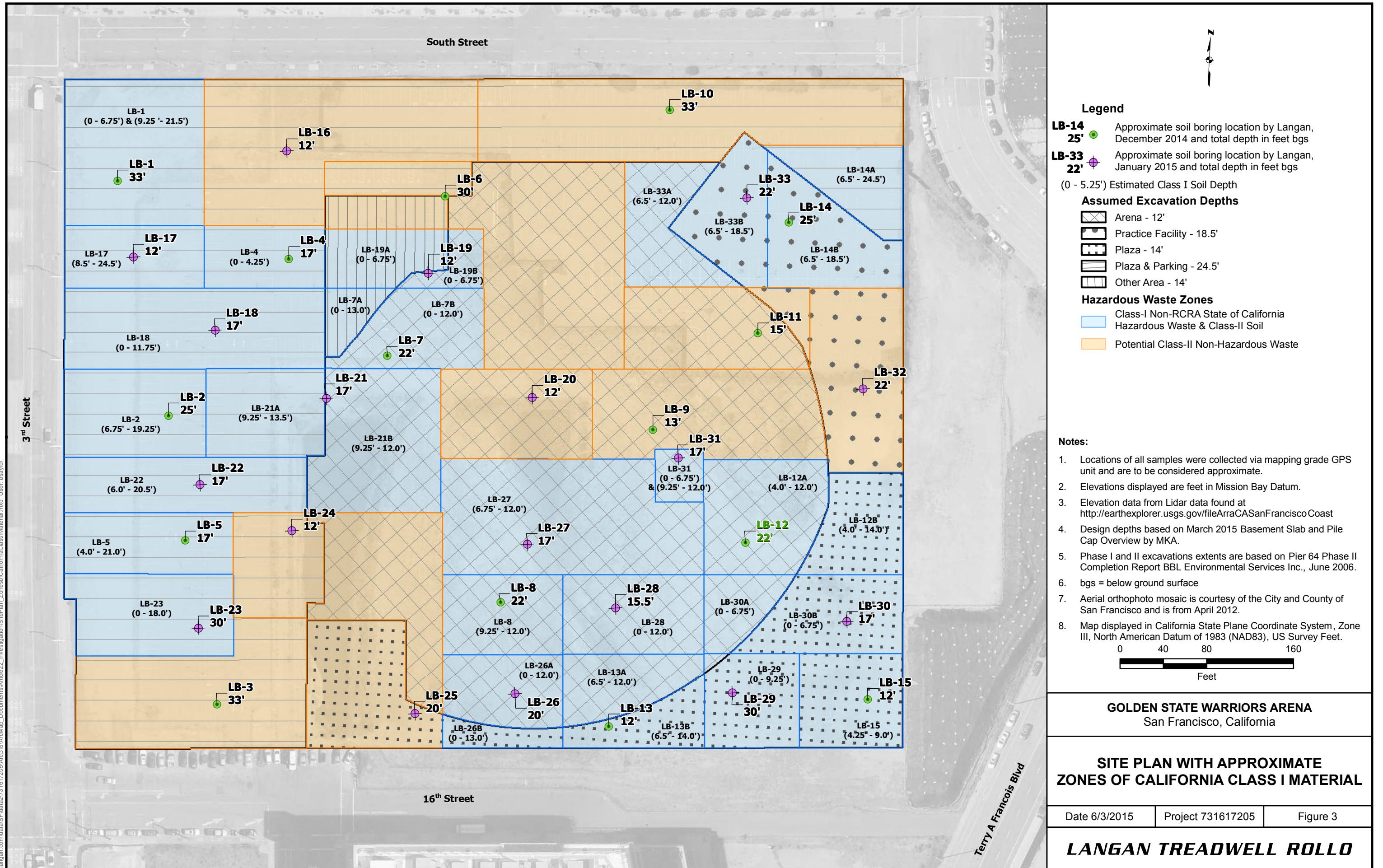
**LANGAN TREADWELL ROLLO**

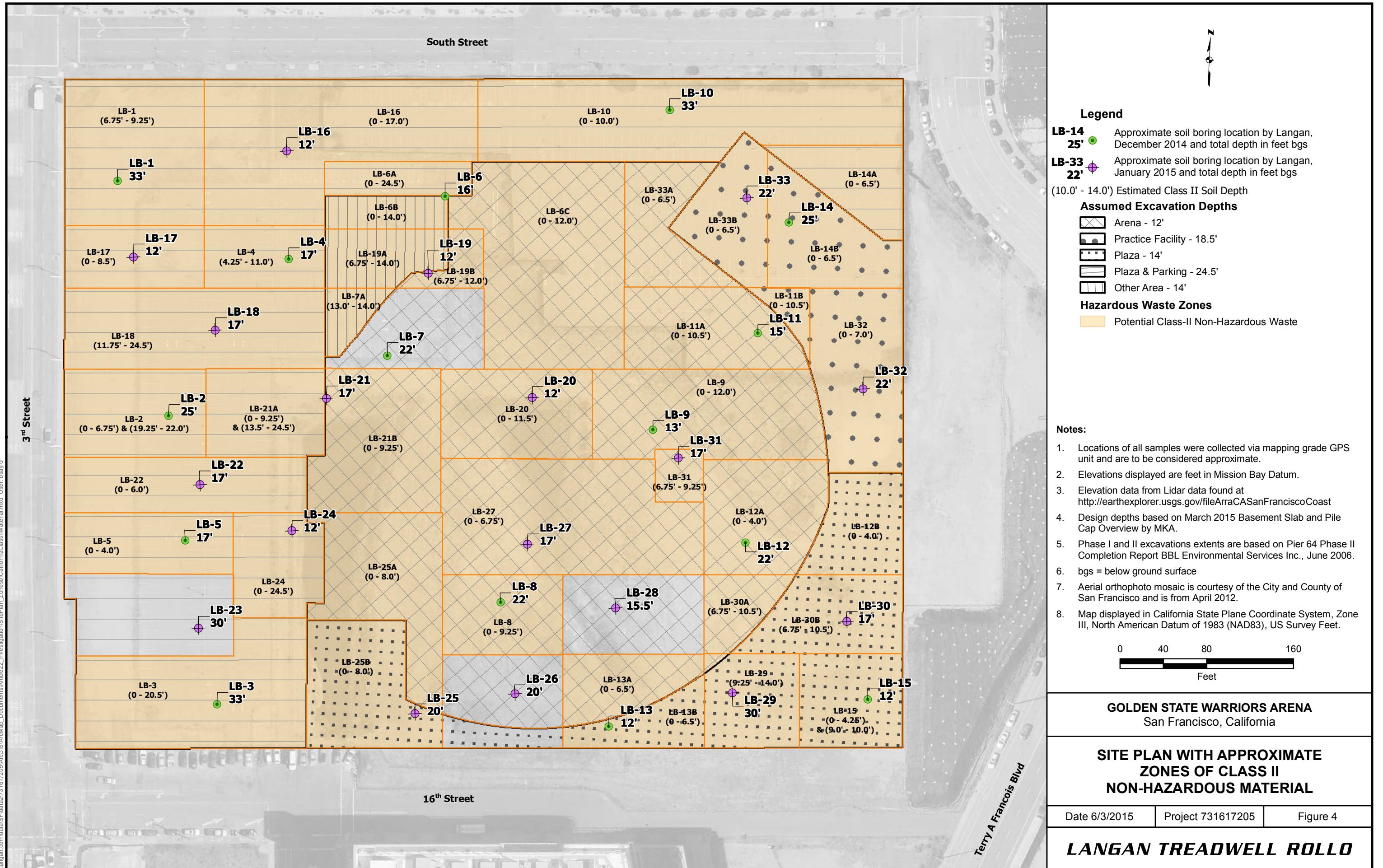
Date 11/21/2014

Project 731617205

Figure 1

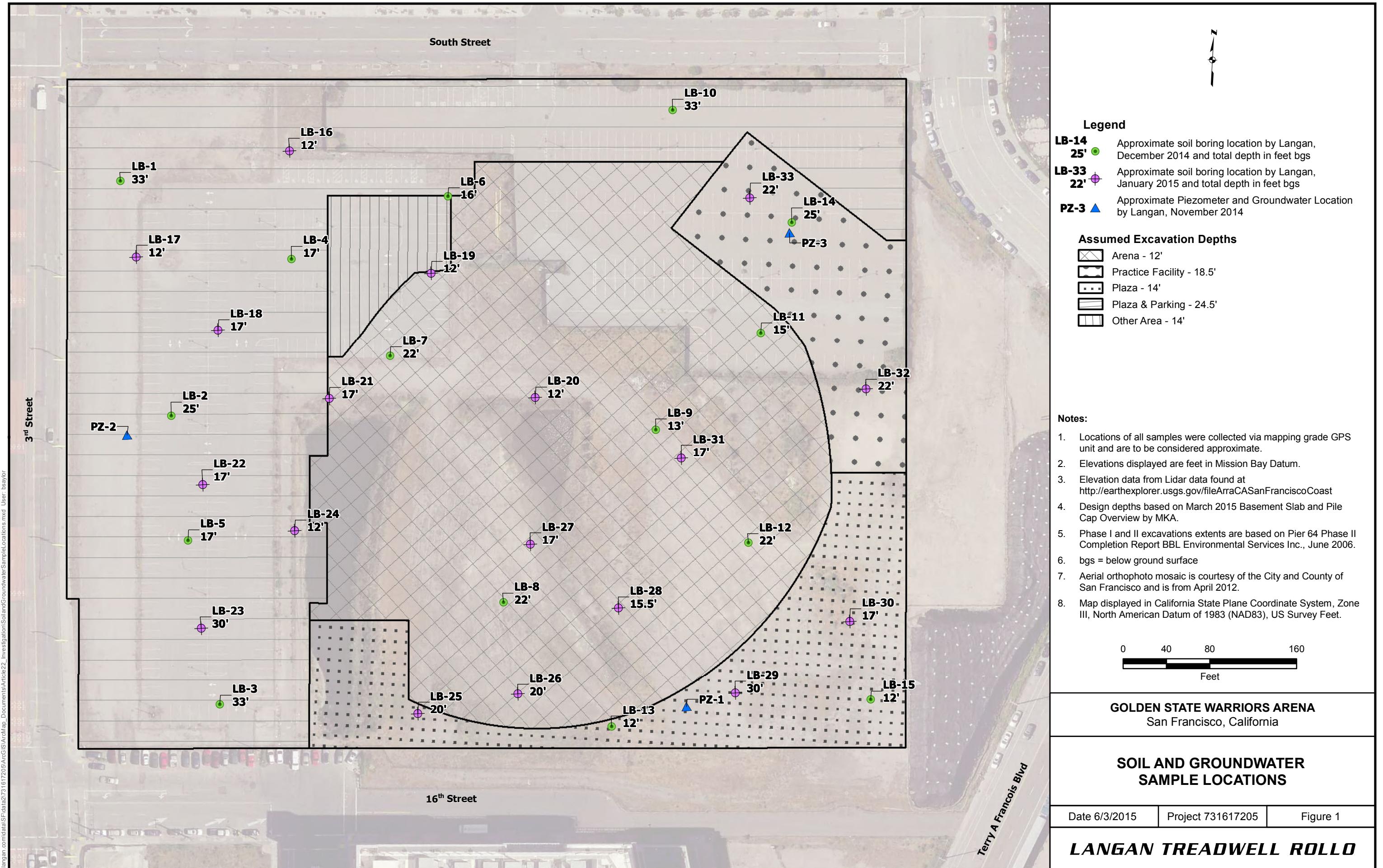






## **APPENDIX A**

### **Phase II ESA Soil and Groundwater Sampling Locations And Analytical Data Tables**



**Table 1**  
**Soil Analytical Results Non Metals**  
**Golden State Warriors Arena**  
**Mission Bay Blocks 29-32**  
**San Francisco, California**

Sample ID	Depth (feet)	Date Sampled	TPHg	TPHd	TPHmo	1,2,4-Trimethyl-benzene	Acetone	Carbon Disulfide	Ethylbenzene	Methyl Ethyl ketone (2-butanone)	O-xylene	M,P-Xylenes	All Other VOCS	PCB-1254 (Aroclor 1254)	All Other PCBs	Cyanide	Sulfide	pH	pH Units
			mg/kg																
LB-01-(5.0-6.0)	5	12/23/14	< 1.1	28	83	-	-	-	-	-	-	-	-	-	-	-	-	7.7	
LB-01-(6.5-7.5)	6.5	12/23/14	< 0.97	4.6	19	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-01-(10.0-11.0)	10	12/23/14	-	-	-	< 0.0048	0.019	< 0.0048	< 0.0048	< 0.0096	< 0.0048	< 0.0048	ND	-	-	-	-	-	
LB-01-(15.0-16.0)	15	12/23/14	-	-	-	< 0.0048	0.025	< 0.0048	< 0.0048	< 0.0095	< 0.0048	< 0.0048	ND	-	-	-	-	-	
LB-01-(20.0-21.0)	20	12/23/14	< 0.94	< 0.99	< 5.0	-	-	-	-	-	-	-	-	-	-	< 0.88	< 10	-	
LB-01-(31.0-32.0)	31	12/23/14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-02-(1.5-2.5)	1.5	12/23/14	< 1.0	130	400	-	-	-	-	-	-	-	-	< 0.012	ND	-	-	-	
LB-02-(5.0-6.0)	5	12/23/14	-	-	-	< 0.0046	< 0.019	< 0.0046	< 0.0046	< 0.0093	< 0.0046	< 0.0046	ND	-	-	< 0.95	< 10	7.1	
LB-02-(6.5-7.5)	6.5	12/23/14	< 1.1	< 1.0	< 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-02-(10.0-11.0)	10	12/23/14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-02-(15.0-16.0)	15	12/23/14	-	-	-	< 0.0045	< 0.018	< 0.0045	< 0.0045	< 0.0090	< 0.0045	< 0.0045	ND	-	-	-	-	-	
LB-02-(21.5-22.5)	21.5	12/23/14	-	-	-	< 0.0048	0.022	0.0079	< 0.0048	< 0.0096	< 0.0048	< 0.0048	ND	< 0.0096	ND	-	-	-	
LB-03-(1.5-2.5)	1.5	12/23/14	< 0.93	170	390	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-03-(5.0-6.0)	5	12/23/14	< 1.1	290	730	< 0.0049	< 0.02	< 0.0049	< 0.0049	< 0.0098	< 0.0049	< 0.0049	ND	-	-	-	-	-	
LB-03-(10.0-11.0)	10	12/23/14	-	-	-	< 0.0048	< 0.019	< 0.0048	< 0.0048	< 0.0095	< 0.0048	< 0.0048	ND	-	-	-	-	-	
LB-03-(20.0-21.0)	20	12/23/14	< 1.1	6.5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-03-(31.0-32.0)	31	12/23/14	-	-	-	< 0.0048	< 0.019	< 0.0048	< 0.0048	< 0.0095	< 0.0048	< 0.0048	ND	-	-	-	-	-	
LB-04-(1.5-2.5)	1.5	12/22/14	< 1.1	71	220	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-04-(5.0-6.0)	5	12/22/14	< 0.95	6	15	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-04-(6.5-7.5)	6.5	12/22/14	< 1.0	17	11	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-04-(10.0-11.0)	10	12/22/14	-	-	-	< 0.0050	0.038	< 0.0050	< 0.0050	< 0.01	< 0.0050	< 0.0050	ND	-	-	-	-	-	
LB-04-(15.0-16.0)	15	12/22/14	-	-	-	< 0.0050	< 0.02	< 0.0050	< 0.0050	< 0.01	< 0.0050	< 0.0050	ND	-	-	-	-	-	
LB-05-(1.5-2.5)	1.5	12/23/14	< 1.1	210	230	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-05-(5.0-5.75)	5	12/23/14	< 0.93	1.8	< 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-05-(5.75-6.5)	5.75	12/23/14	-	-	-	< 0.0047	< 0.019	< 0.0047	< 0.0047	< 0.0095	< 0.0047	< 0.0047	ND	-	-	-	-	-	
LB-05-(10.00-11.00)	10	12/23/14	< 1.1	< 0.99	< 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-05-(15.0-16.0)	15	12/23/14	-	-	-	< 0.0048	< 0.019	< 0.0048	< 0.0048	< 0.0095	< 0.0048	< 0.0048	ND	-	-	-	-	-	
LB-06-(1.5-2.5)	1.5	12/22/14	< 1.0	32	210	-	-	-	-	-	-	-	-	< 0.0096	ND	-	-	-	
LB-06-(5.0-6.0)	5	12/22/14	-	-	-	< 0.0045	< 0.018	< 0.0045	< 0.0045	< 0.0090	< 0.0045	< 0.0045	ND	-	-	< 0.93	< 10	8.3	
LB-06-(6.5-7.5)	6.5	12/22/14	< 1.0	24	13	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-06-(10.0-11.0)	10	12/22/14	-	-	-	< 0.0046	< 0.019	< 0.0046	< 0.0046	< 0.0093	< 0.0046	< 0.0046	ND	-	-	-	-	-	
LB-07-(1.5-2.5)	1.5	12/22/14	< 1.1	39	110	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-07-(5.0-6.0)	5	12/22/14	< 1.1	63	140	< 0.0049	0.033	< 0.0049	< 0.0049	< 0.0098	< 0.0049	< 0.0049	ND	-	-	-	-	-	
LB-07-(6.5-7.5)	6.5	12/22/14	< 1.1	49	110	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-07-(10.0-11.0)	10	12/22/14	-	-	-	< 0.0047	0.033	< 0.0047	< 0.0047	< 0.0095	< 0.0047	< 0.0047	ND	-	-	-	-	-	
LB-07-(15.0-16.0)	15	12/22/14	< 1.0	8.3	< 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-08-(1.5-2.5)	1.5	12/23/14	< 1.0	130	380	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-08-(5.0-6.0)	5	12/23/14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-08-(6.5-7.5)	6.5	12/23/14	6.2	250	240	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-08-(10.0-11.0)	10	12/23/14	-	-	-	0.0078	0.036	< 0.0049	0.007	< 0.0097	0.0068	0.011	ND	-	-	-	-	-	
LB-08-(15.0-16.0)	15	12/23/14	3	160	200	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-08-(20.0-21.0)	20	12/23/14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-09-(1.5-2.5)	1.5	12/23/14	< 0.97	150	750	-	-	-	-	-	-	-	-	0.016	ND	-	-	-	
LB-09-(5.0-6.0)	5	12/23/14	< 1.0	52	430	< 0.0047	< 0.												

**Table 1**  
**Soil Analytical Results Non Metals**  
**Golden State Warriors Arena**  
**Mission Bay Blocks 29-32**  
**San Francisco, California**

Sample ID	Depth (feet)	Date Sampled	TPHg	TPHd	TPHmo	1,2,4-Trimethyl-benzene	Acetone	Carbon Disulfide	Ethylbenzene	Methyl Ethyl ketone (2-butanone)	O-xylene	M,P-Xylenes	All Other VOCS	PCB-1254 (Aroclor 1254)	All Other PCBs	Cyanide	Sulfide	pH	pH Units
			mg/kg																
LB-10-(20.0-21.0)	20	12/22/14	< 1.0	2.9	< 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-10-(31.0-32.0)	31	12/22/14	< 1.0	1	< 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-11-(1.5-2.5)	1.5	12/22/14	< 0.93	150	830	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-11-(5.0-5.75)	5	12/22/14	-	-	-	< 0.0049	< 0.02	< 0.0049	< 0.0049	< 0.0098	< 0.0049	< 0.0049	ND	-	-	-	-	-	
LB-11-(5.75-6.5)	5.75	12/22/14	< 1.0	4.5	< 5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-11-(10.0-11.0)	10	12/22/14	-	-	-	< 0.0048	< 0.019	< 0.0048	< 0.0048	< 0.0095	< 0.0048	< 0.0048	ND	-	-	-	-	-	
LB-12-(1.0-2.0)	1	12/23/14	< 0.92	72	260	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-12-(5.0-6.0)	5	12/23/14	-	-	-	-	-	-	-	-	-	-	-	-	< 0.94	< 10	8.2		
LB-12-(6.5-7.5)	6.5	12/23/14	< 0.98	300	240	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-12-(10.0-11.0)	10	12/23/14	9.9	1,100	1,100	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-12-(15.0-16.0)	15	12/23/14	< 0.94	160	230	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-12-(20.0-21.0)	20	12/23/14	< 1.1	3.2	9.2	< 0.0047	0.028	0.0083	< 0.0047	< 0.0094	< 0.0047	< 0.0047	ND	-	-	-	-	-	
LB-13-(1.0-2.0)	1	12/23/14	< 1.1	70	160	-	-	-	-	-	-	-	-	< 0.0096	ND	-	-	-	
LB-13-(5.0-6.0)	5	12/23/14	-	-	-	-	-	-	-	-	-	-	-	-	< 0.74	< 10	10.2		
LB-13-(6.0-7.0)	6	12/23/14	2.9	690	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-13-(10.0-11.0)	10	12/23/14	1.5	1,300	1,800	< 0.0046	0.056	< 0.0046	< 0.0046	< 0.0091	< 0.0046	< 0.0046	ND	-	-	-	-	-	
LB-14-(1.5-2.5)	1.5	12/22/14	< 1.1	5.1	18	-	-	-	-	-	-	-	-	< 0.0096	ND	-	-	-	
LB-14-(5.0-6.0)	5	12/22/14	-	-	-	< 0.0045	< 0.018	< 0.0045	< 0.0045	< 0.0089	< 0.0045	< 0.0045	ND	-	-	-	-	-	
LB-14-(6.0-7.0)	6	12/22/14	< 1.1	6.2	< 5.0	-	-	-	-	-	-	-	-	-	< 0.96	< 10	7.7		
LB-14-(10.0-10.75)	10	12/22/14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-14-(15.0-16.0)	15	12/22/14	-	-	-	< 0.0044	< 0.018	< 0.0044	< 0.0044	< 0.0088	< 0.0044	< 0.0044	ND	-	-	-	-	-	
LB-14-(20.0-21.0)	20	12/22/14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-14-(22.5-23.5)	22.5	12/22/14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-15-(1.5-2.5)	1.5	12/23/14	< 1.1	21	64	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-15-(5.0-6.0)	5	12/23/14	-	-	-	< 0.0048	< 0.019	< 0.0048	< 0.0048	< 0.0096	< 0.0048	< 0.0048	ND	-	-	-	-	-	
LB-15-(6.5-7.5)	6.5	12/23/14	< 1.1	640	1,100	-	-	-	-	-	-	-	-	-	-	-	-	-	
LB-15-(10.0-10.5)	10	12/23/14	-	-	-	< 0.0048	0.17	< 0.0048	< 0.0048	0.032	< 0.0048	< 0.0048	ND	-	-	-	-	-	

Notes:

mg/kg - milligrams per kilograms

TPHg - Total Petroleum Hydrocarbons as Gasoline, EPA Method 8015B

TPHd - Total Petroleum Hydrocarbons as Diesel Range, EPA Method 8015B

TPHmo - Total Petroleum Hydrocarbons as Motor Oil, EPA Method 8015B

PCBs - Polychlorinated biphenyls

VOCs - Volatile Organic Compounds, EPA 8260B

< - Analyte was not detected at or above the laboratory reporting limit

ND - Not detected at or above the laboratory reporting limit

-- Not Analyzed

**Table 2**  
**Soil Analytical Results Semi-volatile Organic Compounds**  
**Golden State Warriors Arena**  
**Mission Bay Blocks 29-32**  
**San Francisco California**

Langan Project: 731617205  
June 2015

**Table 2**  
**Soil Analytical Results Semi-volatile Organic Compounds**  
**Golden State Warriors Arena**  
**Mission Bay Blocks 29-32**  
**San Francisco California**

Sample ID	Depth (feet)	Date Sampled	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Dibenz(a,h)-anthracene	Fluoran-thene	Fluorene	Indeno-(1,2,3-c,d)-pyrene	Naphthalene	Phenanthrene	Pyrene	
			mg/kg																
LB-10-(31.0-32.0)	31	12/22/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-11-(1.5-2.5)	1.5	12/22/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-11-(5.0-5.75)	5	12/22/14	< 0.0050	< 0.0050	< 0.0050	0.0058	0.0081	0.0099	0.0074	< 0.0050	0.0069	< 0.0050	0.01	< 0.0050	0.0054	< 0.0050	0.0078	0.0092	
LB-11-(5.75-6.5)	5.75	12/22/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-11-(10.0-11.0)	10	12/22/14	< 0.01	< 0.01	< 0.01	< 0.01	0.011	0.012	< 0.01	< 0.01	< 0.01	< 0.01	0.017	< 0.01	< 0.01	< 0.01	0.02	0.032	
LB-12-(1.0-2.0)	1	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-12-(5.0-6.0)	5	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-12-(6.5-7.5)	6.5	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-12-(10.0-11.0)	10	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-12-(15.0-16.0)	15	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-12-(20.0-21.0)	20	12/23/14	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	
LB-13-(1.0-2.0)	1	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-13-(5.0-6.0)	5	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-13-(6.0-7.0)	6	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-13-(10.0-11.0)	10	12/23/14	< 0.01	< 0.01	0.02	0.04	0.071	0.082	0.011	0.026	0.055	< 0.01	0.082	< 0.01	0.011	< 0.01	0.049	0.1	
LB-14-(1.5-2.5)	1.5	12/22/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-14-(5.0-6.0)	5	12/22/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-14-(6.0-7.0)	6	12/22/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-14-(10.0-10.75)	10	12/22/14	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	
LB-14-(15.0-16.0)	15	12/22/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-14-(20.0-21.0)	20	12/22/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-14-(22.5-23.5)	22.5	12/22/14	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.02	< 0.0050	< 0.0050	0.0086	< 0.0050
LB-15-(1.5-2.5)	1.5	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-15-(5.0-6.0)	5	12/23/14	< 0.025	< 0.025	0.039	0.058	0.11	0.13	0.033	0.041	0.075	< 0.025	0.084	< 0.025	0.03	< 0.025	0.045	0.096	
LB-15-(6.5-7.5)	6.5	12/23/14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LB-15-(10.0-10.5)	10	12/23/14	0.028	0.017	0.086	0.16	0.22	0.21	0.085	0.071	0.17	0.028	0.41	0.04	0.079	0.02	0.31	0.36	

Notes:

mg/kg - milligrams per kilograms

SVOCs - Semi-Volatile Organic Compounds, EPA 8260B

< - Analyte was not detected at or above the laboratory reporting limit

-- Not Analyzed

**Table 3  
Soil Analytical Results Metals  
Golden State Warriors Arena  
Mission Bay Blocks 29-32  
San Francisco California**

Sample ID	Depth (feet)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium WET	Chromium TCLP	Cobalt	Copper	Lead	Lead WET	Lead TCLP	Mercury	Molybdenum	Nickel	Nickel WET	Selenium	Silver	Thallium	Vanadium	Zinc	
			mg/kg						mg/L			mg/kg			mg/L		mg/kg			mg/L		mg/kg			
LB-01-(5.0-6.0)	5	12/23/14	--	--	--	--	--	--	--	--	--	--	670	<b>41</b>	3	--	--	--	--	--	--	--	--	--	--
LB-01-(6.5-7.5)	6.5	12/23/14	--	--	--	--	0.73	44	--	--	--	--	140	4.3	0.064	--	--	21	--	--	--	--	--	--	99
LB-01-(10.0-11.0)	10	12/23/14	< 0.23	< 0.23	4.6	< 0.23	< 0.23	1,800	<b>13</b>	< 0.05	91	9.2	< 0.23	--	--	< 0.015	< 0.37	<b>2,400</b>	--	< 0.23	< 0.23	< 0.23	31	28	
LB-01-(20.0-21.0)	20	12/23/14	--	--	--	--	--	--	--	--	--	--	< 0.25	--	--	--	--	--	--	--	--	--	--	--	
LB-01-(31.0-32.0)	31	12/23/14	--	--	--	--	--	--	--	--	--	--	3.8	--	--	--	--	--	--	--	--	--	--	--	
LB-02-(1.5-2.5)	1.5	12/23/14	--	--	--	--	--	0.35	32	--	--	--	3.4	--	--	--	--	16	--	--	--	--	--	--	18
LB-02-(5.0-6.0)	5	12/23/14	4.1	2.9	30	< 0.25	< 0.25	1,200	2.1	< 0.05	76	43	130	< 0.25	< 0.05	0.4	0.53	1,700	19	< 0.26	< 0.25	< 0.25	28	36	
LB-02-(6.5-7.5)	6.5	12/23/14	--	--	--	--	1.7	1,400	<b>7.8</b>	0.051	--	--	< 0.26	--	--	--	--	1,900	--	--	--	--	--	--	18
LB-02-(10.0-11.0)	10	12/23/14	--	--	--	--	--	--	--	--	--	--	< 0.24	--	--	--	--	--	--	--	--	--	--	--	
LB-02-(15.0-16.0)	15	12/23/14	< 0.24	0.34	3.9	< 0.24	< 0.24	1,500	<b>5.2</b>	< 0.05	87	13	0.29	--	--	< 0.016	< 0.39	<b>2,000</b>	--	< 0.24	< 0.24	< 0.24	30	20	
LB-02-(21.5-22.5)	21.5	12/23/14	--	--	--	--	0.77	45	--	--	--	--	2.5	--	--	--	--	46	--	--	--	--	--	--	33
LB-03-(1.5-2.5)	1.5	12/23/14	--	--	--	--	0.81	51	--	--	--	--	74	3.4	--	--	--	42	--	--	--	--	--	--	78
LB-03-(5.0-6.0)	5	12/23/14	--	--	--	--	--	--	--	--	--	--	79	4.2	--	--	--	--	--	--	--	--	--	--	
LB-03-(10.0-11.0)	10	12/23/14	< 0.25	0.3	16	< 0.25	< 0.25	680	2.2	< 0.05	77	10	0.67	--	--	< 0.018	< 0.43	1,700	14	< 0.25	< 0.25	< 0.25	19	17	
LB-03-(20.0-21.0)	20	12/23/14	--	--	--	--	--	--	--	--	--	--	0.86	--	--	--	--	--	--	--	--	--	--	--	
LB-04-(1.5-2.5)	1.5	12/22/14	--	--	--	--	1.1	27	--	--	--	--	160	<b>9.3</b>	0.21	--	--	28	--	--	--	--	--	--	110
LB-04-(5.0-6.0)	5	12/22/14	0.38	6.3	78	0.41	< 0.25	37	--	--	9.4	27	13	--	--	0.042	1.1	48	--	< 0.25	< 0.25	< 0.25	43	57	
LB-04-(6.5-7.5)	6.5	12/22/14	--	--	--	--	--	--	--	--	--	--	1.8	--	--	--	--	--	--	--	--	--	--	--	
LB-04-(10.0-11.0)	10	12/22/14	< 0.24	3.8	100	0.38	< 0.24	89	0.79	--	23	19	8.7	--	--	0.033	< 0.39	140	--	< 0.24	< 0.24	< 0.24	40	32	
LB-04-(15.0-16.0)	15	12/22/14	--	--	--	--	0.79	47	--	--	--	--	5.9	--	--	--	--	43	--	--	--	--	--	--	40
LB-05-(1.5-2.5)	1.5	12/23/14	--	--	--	--	< 0.26	27	--	--	--	--	20	--	--	--	--	50	--	--	--	--	--	--	15
LB-05-(5.0-5.75)	5	12/23/14	< 0.25	< 0.26	4.6	< 0.25	< 0.25	1,700	2.4	< 0.05	93	17	< 0.25	--	--	< 0.016	< 0.43	<b>2,200</b>	--	< 0.26	< 0.25	< 0.25	35	28	
LB-05-(5.75-6.5)	5.75	12/23/14	--	--	--	--	1.5	900	4.8	< 0.05	--	--	< 0.23	--	--	--	--	<b>2,000</b>	--	--	--	--	--	--	17
LB-05-(10.00-11.00)	10	12/23/14	--	--	--	--	--	--	--	--	--	--	< 0.23	--	--	--	--	--	--	--	--	--	--	--	
LB-05-(15.0-16.0)	15	12/23/14	--	--	--	--	--	--	--	--	--	--	0.37	--	--	--	--	--	--	--	--	--	--	--	
LB-06-(1.5-2.5)	1.5	12/22/14	--	--	--	--	--	--	--	--	--	--	48	--	--	--	--	--	--	--	--	--	--	--	
LB-06-(5.0-6.0)	5	12/22/14	--	--	--	--	--	--	--	--	--	--	230	3.4	0.17	--	--	--	--	--	--	--	--	--	
LB-06-(6.5-7.5)	6.5	12/22/14	< 0.24	4.1	95	0.28	0.48	430	2.7	< 0.05	43	32	14	--	--	0.055	0.52	830	14	< 0.24	< 0.24	< 0.24	36	230	
LB-06-(10.0-11.0)	10	12/22/14	--	--	--	--	--	--	--	--	--	--	18	--	--	--	--	--	--	--	--	--	--	--	
LB-07-(1.5-2.5)	1.5	12/22/14	--	--	--	--	1.1	65	0.42	--	--	--	91	<b>5.6</b>	--	--	--	85	--	--	--	--	--	--	100
LB-07-(5.0-6.0)	5	12/22/14	5	13	160	0.41	0.39	63	< 0.25	--	12	58	160	<b>19</b>	0.29	0.45	0.73	66	--	< 0.25	0.99	< 0.25	47	170	
LB-07-(6.5-7.5)	6.5	12/22/14	--	--	--	--	1.1	55	0.31	--	--	--	140	<b>10</b>	0.19	--	--	43	--	--	--	--	--	--	110
LB-07-(10.0-11.0)	10	12/22/14	--	--	--	--	--	--	--	--	--	--	120	<b>6</b>	0.13	--	--	--	--	--	--	--	--	--	
LB-07-(15.0-16.0)	15	12/22/14	--	--	--	--	--	--	--	--	--	--	5.8	--	--	--	--	--	--	--	--	--	--	--	
LB-08-(1.5-2.5)	1.5	12/23/14	--	--	--	--	1.1	420	1.2	< 0.05	--	--	32	--	--	--	--	450	4	--	--	--	--	--	56
LB-08-(5.0-6.0)	5	12/23/14	--	--	--	--	--	--	--	--	--	--	16	--	--	--	--	--	--	--	--	--	--	--	
LB-08-(6.5-7.5)	6.5	12/23/14	< 0.25	3.3	67	0.27	< 0.25	220	0.65	< 0.05	27	18	89	1.5	--	0.077	< 0.45	540	3						

**Table 3**  
**Soil Analytical Results Metals**  
**Golden State Warriors Arena**  
**Mission Bay Blocks 29-32**  
**San Francisco California**

Sample ID	Depth (feet)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium WET	Chromium TCLP	Cobalt	Copper	Lead	Lead WET	Lead TCLP	Mercury	Molybdenum	Nickel	Nickel WET	Selenium	Silver	Thallium	Vanadium	Zinc	
			mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	
LB-10-(1.5-2.5)	1.5	12/22/14	—	—	—	—	—	—	—	—	—	—	53	2.9	—	—	—	—	—	—	—	—	—	—	
LB-10-(5.0-6.0)	5	12/22/14	0.28	6	110	0.45	< 0.25	52	< 0.25	—	14	37	8.8	—	—	0.076	0.82	73	—	< 0.25	< 0.25	< 0.25	39	61	
LB-10-(6.0-7.0)	6	12/22/14	—	—	—	—	1.3	44	—	—	—	—	9.8	—	—	—	—	62	—	—	—	—	—	74	
LB-10-(20.0-21.0)	20	12/22/14	—	—	—	—	—	—	—	—	—	—	3.7	—	—	—	—	—	—	—	—	—	—	—	
LB-10-(31.0-32.0)	31	12/22/14	—	—	—	—	—	—	—	—	—	—	3.8	—	—	—	—	—	—	—	—	—	—	—	
LB-11-(1.5-2.5)	1.5	12/22/14	—	—	—	—	1.2	95	< 0.25	—	—	—	—	230	2	0.074	—	—	140	—	—	—	—	—	310
LB-11-(5.0-5.75)	5	12/22/14	—	—	—	—	0.63	27	—	—	—	—	300	1.1	< 0.05	—	—	16	—	—	—	—	—	—	160
LB-11-(5.75-6.5)	5.75	12/22/14	—	—	—	—	—	—	—	—	—	—	18	—	—	—	—	—	—	—	—	—	—	—	
LB-11-(10.0-11.0)	10	12/22/14	—	—	—	—	—	—	—	—	—	—	54	—	—	—	—	—	—	—	—	—	—	—	
LB-12-(1.0-2.0)	1	12/23/14	—	—	—	—	1.2	96	0.47	—	—	—	—	92	4.9	—	—	—	160	—	—	—	—	—	97
LB-12-(5.0-6.0)	5	12/23/14	—	—	—	—	—	—	—	—	—	—	180	<b>6.7</b>	< 0.05	—	—	—	—	—	—	—	—	—	—
LB-12-(6.5-7.5)	6.5	12/23/14	1.8	3.8	130	0.26	0.31	150	1.5	< 0.05	19	88	350	<b>22</b>	0.79	0.28	0.45	290	7	< 0.23	< 0.23	< 0.23	33	170	
LB-12-(10.0-11.0)	10	12/23/14	—	—	—	—	—	—	—	—	—	—	<b>1,500</b>	—	0.43	—	—	—	—	—	—	—	—	—	
LB-12-(15.0-16.0)	15	12/23/14	—	—	—	—	0.76	40	—	—	—	—	55	10	—	—	—	49	—	—	—	—	—	80	
LB-12-(20.0-21.0)	20	12/23/14	—	—	—	—	1	55	< 0.25	—	—	—	—	3.4	—	—	—	—	54	—	—	—	—	—	43
LB-13-(1.0-2.0)	1	12/23/14	—	—	—	—	1.2	130	1	< 0.05	—	—	73	4.3	—	—	—	160	—	—	—	—	—	90	
LB-13-(5.0-6.0)	5	12/23/14	—	—	—	—	—	—	—	—	—	—	50	2.8	—	—	—	—	—	—	—	—	—	—	
LB-13-(6.0-7.0)	6	12/23/14	0.92	6.5	140	0.28	0.35	95	0.46	—	13	94	370	<b>11</b>	1.4	0.32	0.68	150	—	< 0.24	0.31	< 0.24	43	310	
LB-13-(10.0-11.0)	10	12/23/14	—	—	—	—	1	120	0.4	< 0.05	—	—	150	<b>14</b>	0.49	—	—	160	—	—	—	—	—	160	
LB-14-(1.5-2.5)	1.5	12/22/14	—	—	—	—	0.53	31	—	—	—	—	3.6	—	—	—	—	40	—	—	—	—	—	29	
LB-14-(5.0-6.0)	5	12/22/14	< 0.23	8.4	160	0.43	< 0.23	89	< 0.25	—	17	63	6.8	—	—	0.035	6.7	80	—	< 0.23	< 0.23	< 0.23	50	79	
LB-14-(6.0-7.0)	6	12/22/14	—	—	—	—	—	400	—	—	—	—	4.1	—	—	—	—	900	—	—	—	—	—	—	
LB-14-(15.0-16.0)	15	12/22/14	—	—	—	—	—	690	—	—	—	—	1	—	—	—	—	1,200	—	—	—	—	—	—	
LB-14-(20.0-21.0)	20	12/22/14	< 0.25	1	360	< 0.25	< 0.25	590	6.8	< 0.05	74	28	2.5	—	—	< 0.018	< 0.41	1,600	<b>48</b>	< 0.25	< 0.25	< 0.25	17	19	
LB-14-(22.5-23.5)	22.5	12/22/14	—	—	—	—	—	250	—	—	—	—	2	—	—	—	—	490	—	—	—	—	—	—	
LB-15-(1.5-2.5)	1.5	12/23/14	—	—	—	—	1.1	49	—	—	—	—	210	1.1	< 0.05	—	—	62	—	—	—	—	—	79	
LB-15-(5.0-6.0)	5	12/23/14	1.3	6.4	170	0.26	0.65	180	0.73	< 0.05	22	110	490	<b>36</b>	0.64	0.58	0.5	370	5.9	< 0.26	0.45	< 0.25	35	420	
LB-15-(6.5-7.5)	6.5	12/23/14	—	—	—	—	1.2	180	0.6	< 0.05	—	—	280	<b>20</b>	0.36	—	—	320	4	—	—	—	—	370	
LB-15-(10.0-10.5)	10	12/23/14	—	—	—	—	—	—	—	—	—	—	120	2.9	< 0.05	—	—	—	—	—	—	—	—	—	
LB-16-(2.0-2.5)	2	01/26/15	—	—	—	—	—	—	—	—	—	—	310	1.2	—	—	—	—	—	—	—	—	—	—	
LB-16-(5.5-6.0)	5.5	01/26/15	—	—	—	—	—	—	—	—	—	—	2.6	—	—	—	—	—	—	—	—	—	—	—	
LB-16-(10.5-11.0)	10.5	01/26/15	—	—	—	—	—	800	0.72	—	—	—	—	—	—	—	—	1,700	12	—	—	—	—	—	
LB-17-(2.0-2.5)	2	01/26/15	—	—	—	—	—	460	2.7	—	—	—	250	3.4	—	—	—	930	15	—	—	—	—	—	
LB-17-(5.5-6.0)	5.5	01/26/15	—	—	—	—	—	100	—	—	—	46	—	—	—	—	110	—	—	—	—	—	—	—	
LB-17-(10.5-11.0)	10.5	01/26/15	—	—	—	—	—	750	<b>16</b>	0.095	—	—	—												

**Table 3  
Soil Analytical Results Metals  
Golden State Warriors Arena  
Mission Bay Blocks 29-32  
San Francisco California**

## Notes

mg/kg - milligrams per kilograms

mg/L - milligrams per liter

**Bold** - indicates results exceed Hazardous Waste Criteria

WET - California Waste Extraction Test

TTLC - California Total Threshold Limit Concentration - State hazardous waste criterion

STLC - California Soluble Threshold Limit Concentration - State hazardous waste criterion

## TCLP - Federal Toxicity Characteristic Leaching Potential Analysis - Federal hazardous waste criterion

< - Analyte was not detected at or above the laboratory reporting limit

-- - Not Analyzed

**Table 4**  
**Groundwater Analytical Results Non Metals**  
**Golden State Warriors Arena**  
**Mission Bay Blocks 29-32**  
**San Francisco California**

Sample ID	Date Sampled	TPHg	TPHd	TPHmo	Benzene	All other VOCs	Naphthalene	All other SVOCs	Chemical oxygen demand	Chlorides	Cyanide	Phenolics, total recoverable	Sulfide	Total suspended solids*	Flash point	PH						
									µg/L													
PZ-1	12/10/14	140	440	< 300	4.4	ND	2.8	ND	480,000	—	10	330	530	17,000	150	11.8						
	03/02/15	—	—	—	—	—	—	—	—	7,200	—	—	—	—	—	7.1						
PZ-2	12/10/14	< 50	< 50	< 300	< 1.0	ND	< 0.1	ND	110,000	—	< 10	< 50	< 40	8,000	150	8.2						
	03/02/15	—	—	—	—	—	—	—	—	1,600	—	—	—	—	—	8.2						
PZ-3	12/10/14	< 50	< 50	< 300	< 1.0	ND	< 0.1	ND	—	—	—	—	—	—	—	—						
	03/02/15	—	—	—	—	—	—	—	—	15,000	—	—	—	—	—	7.8						
Regulatory Limit for Batch Wastewater Discharges	NE	NE	NE	500	NE	NE	NE	NE	NE	NE	1,000	23,000	500	NE	≥140	6.0 ≤ pH ≤ 9.5						

Notes:

µg/L - micrograms per Liter

TPHg - Total Petroleum Hydrocarbons as Gasoline, EPA Method 8015B

TPHd - Total Petroleum Hydrocarbons as Diesel, EPA Method 8015B

TPHmo - Total Petroleum Hydrocarbons as Motor Oil, EPA Method 8015B

VOCs - Volatile Organic Compounds, EPA 8260B

SVOCs - Semi volatile organic compounds, EPA Method 8270

< - Analyte was not detected at or above the laboratory reporting limit

ND - Not detected at or above the laboratory reporting limit

NE - Not established

-- Not Analyzed

Regulatory Limits for Batch Wastewater Discharges cited from *Requirements for Batch Wastewater Discharges, Appendix 1 and 2*, by the San Francisco Public Utilities Commission, dated May 2012.

\* - Total suspended soilids elevated as a result of turbid groundwater sample.

**Table 5**  
**Groundwater Analytical Result Metals**  
**Golden State Warriors Arena**  
**Mission Bay Blocks 29-32**  
**San Francisco California**

Sample ID	Date Sampled		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium Total	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
			µg/L																
PZ-1	12/10/14	Total	1.3	8.1	1,600	< 1.0	< 1.0	1.1	1	1.5	2.2	< 0.20	39	510	1.7	< 1.0	< 1.0	7.7	6.3
		Dissolved	< 1.0	7.6	1,500	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 0.20	38	510	1.9	< 1.0	< 1.0	6.3	< 5.0
	03/02/15	Total	--	--	--	--	--	--	--	--	--	--	51	--	--	--	--	--	
PZ-2	12/10/14	Total	--	--	--	--	< 5.0	< 5.0	--	--	< 5.0	--	--	20	--	--	--	< 20	
		Dissolved	--	--	--	--	< 5.0	< 5.0	--	--	< 5.0	--	--	18	--	--	--	< 20	
	03/02/15	Total	--	--	--	--	--	--	--	--	--	--	28	--	--	--	--	--	
PZ-3	12/10/14	Total	< 1.0	2.2	68	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	6.6	24	< 1.0	< 1.0	< 1.0	< 2.5	< 5.0
		Dissolved	< 1.0	1.8	58	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.77	5.5	22	< 1.0	< 1.0	< 1.0	< 2.5	< 5.0
	03/02/15	Total	--	--	--	--	--	--	--	--	--	--	21	--	--	--	--	--	
Regulatory Limit for Batch Wastewater Discharges (Total)			NE	4,000	NE	NE	500	5,000	NE	4,000	1,500	50	NE	2,000	NE	600	NE	NE	7,000

Notes:

µg/L - micrograms per Liter

&lt; - Analyte was not detected at or above the laboratory reporting limit

-- Not Analyzed

NE - Not established

Regulatory Limits for Batch Wastewater Discharges cited from *Requirements for Batch Wastewater Discharges, Appendix 1*, by the San Francisco Public Utilities Commission, dated May 2012.