ENVIRON's October 13, 2014 Response to DTSC's June 27, 2014 Comments to Draft Preliminary Environmental Assessment (PEA) Workplan Prepared by ENVIRON on May 23, 2014 for the Santa Monica Malibu Unified School District

Item	DTSC Comment	ENVIRON Response
GENERAL COMMENTS		
1. Groundwater Sampling	Selected septic systems have received wastewater from sources other than sanitary systems. According to information summarized by Environ on June 16, 2014, septic systems 1, 3, 5, and 8 have also serviced classrooms that may include art, science laboratories, and wood shops. Groundwater sampling of the existing monitoring wells associated with these septic systems should be included in the sampling plan. This includes wells MW-3, MW-4, MW-5, MW-6, MW-7, MW-10, and MW-11 for both anticipated upgradient and downgradient water quality. The Contaminants of Potential Concern (COPCs) designated for soil and soil vapor sampling associated with the septic systems (VOCs, SVOCs, TPH, and metals) should also be analyzed in groundwater from the selected existing wells. This change should be implemented throughout the document text, tables, and figures. The Field Sampling Protocol already includes groundwater sampling by low flow purge and sample methods. In the Data Quality Objectives (DQOs) it should be made clear that since the groundwater is not a designated source of drinking water, actions regarding the groundwater will not be predicated on comparison to the State of California drinking water Maximum Contaminant Levels (MCLs), but concentrations in groundwater will be evaluated to determine groundwater quality. The DQOs (Section 5.3) should address both the groundwater sampling at the former underground storage tank (UST) area and the septic systems areas.	Comment noted. The table in Section 5.1.2 has been modified to reflect septic systems 1, 3, 5, and 8 as servicing classrooms that may include art, science laboratories, and wood shops, as appropriate. Section 5.2.1 has been modified to state, "groundwater samples will be collected from monitoring wells MW-3 through MW-7, MW-10, and MW-11 to evaluate groundwater quality upgradient and downgradient from septic systems 1, 3, 5, and 8." Data Quality Objectives have been adjusted in Section 5.3. Section 6.2 has been modified to include sampling of monitoring wells MW-3, MW-4, MW-5, MW-6, MW-7, MW-10, and MW-11. Table 4C has been modified to include analysis of monitoring well groundwater samples for VOCs, SVOCs, TPH, and metals.
2. Grounds Shop Inspection	The interior of the Grounds Shop, AOI-11, should be inspected to determine if any additional sampling locations are needed in that area.	Comment noted. DTSC personnel assessed the Grounds Shop, AOI-11, and requested one soil boring in this area. Figure 17 has been modified to depict this sampling location.
3. Incremental Sampling Methodology Implementation (AOI-14)	Incremental Sampling Methodology (ISM) is proposed for AOI-14, the football field, baseball and softball fields, and upper soccer field areas. In consideration of the large spatial area of the recreational fields, DTSC recommends dividing AOI-14 into three separate ISM decision units (DU), based on their common uses and likely exposure scenarios as discussed at the public meeting on June 26, 2014. The football field should be treated as one DU, the large baseball field as a second DU, and upper (i.e., softball and soccer) fields as a third DU. For the football field DU, a grid creating about 40 increments should be sampled in a systematic-random manner to create three replicate samples. For the baseball field DU, a grid creating about 30 roughly equally-sized increments should be sampled in a systematic-random manner to create three replicate samples. The third DU should also be divided into 30 approximately equally-sized increments. The Interstate Technology & Regulatory Council (ITRC) Technical and Regulatory Guidance on Incremental Sampling Methodology (ITRC, February 2012) should be consulted and referenced in planning and implementing the ISM sampling in AOI-14. Revisions should be made to the text and appendices to include details of the sampling grids and systematic-random sample locations, sample collection and laboratory processing, subsampling and sample aliquot sizes.	Comment noted. The athletic fields were divided into three DUs, and sampled accordingly. Revisions were made to Section 5.2.1 of the Work Plan, to Figure 17, and to the soil sampling protocol included in Appendix H.

Item	DTSC Comment	ENVIRON Response
SPECIFIC COMMENTS AND RECOMMENDATIONS		
1. Section 1.2 Objectives	Include sampling of existing groundwater monitoring wells associated with four septic systems.	Section 1.2 has been modified to include a new bullet, stating, "Evaluate groundwater quality in proximity to septic systems 1, 3, 5, and 8, and in the area of the former underground storage tanks (USTs) at the MHS Bus Barn."
2. Section 3.5 Climate -	Reference is made to California Climate Zone 9. Describe the general characteristics of this Climate Zone and include a citation for the climate zone classification.	Information regarding the climate zone and characteristics (rainfall and temperature range) was obtained from the Arcadis 2010 report. A citation has been added to Section 3.5 to indicate the source of the information. Additional information was not provided in the Arcadis report.
3. Section 4.4.2 Other Evaluations/Investigation, Oil Wells	Well "Malibou 1" *(sic)* is noted to have been located within 0.5 miles of the site, though plugged and abandoned, no direction is noted. Note that the EDR in Appendix C indicates that the location is south of the school site.	Comment noted. No changes were made to the text.
4. Section 4.5 COPCs and Areas of Interest (AOIs)	At the end of the last paragraph, refer to Table 2.	Comment noted. See reference to Table 2.
5. Section 5.1.2 Identification of AOIs (in text table)	Delete arsenic as a COPC from AOI 1 as the analysis is not required per DTSC Guidance. Pesticides are in the COPCs column for AOI 11 which should then include storage of pesticides in the Rationale for Selection.	See revisions to the table in Section 5.1.2. Arsenic was deleted as a COPC for AOI 1. The storage of pesticides has been added in the rationale for selection for AOI 11.
6. Section 5.2	Revise bullet five to include evaluation of groundwater at existing monitoring wells associated with the four septic systems.	The 5th bullet in Section 5.2 has been revised to state "Evaluate potential impact to soil from septic tanks and groundwater from septic tanks 1, 3, 5, and 8, and associated leach field/pits."
7. Section 5.2.1	Revise the last sentence of the first paragraph to include sampling of the selected existing groundwater wells.	The last sentence of the first paragraph was deleted and the follow sentence was added to the paragraph in Section 5.2.1 "In addition, groundwater samples will be collected from monitoring wells MW-3 through MW-7, MW-10 and MW-11 to evaluate groundwater quality upgradient and downgradient from septic systems 1, 3, 5, and 8."
8. Section 5.3, Data Quality Objectives, #3, Action Level	The basis for the action level seems to apply only to soil and soil gas samples. Include discussion that will apply to the groundwater sampling related to the former UST area and the selected existing groundwater monitoring wells near septic systems (e.g. comparison with upgradient or historical groundwater quality). DTSC notes that the groundwater under consideration does not have designated beneficial uses according to the Los Angeles Regional Water Quality Control Board, Basin Plan (1994).	In Section 5.3, #3, under "Determine the Basis for Determining the Action Level," the following language has been added "Groundwater quality upgradient and downgradient of the four septic systems will be compared and COPC concentrations in the former UST area will be compared to previously detected concentrations in this area. Maximum Contaminant Levels (MCLs) and Notification Levels (NLs) also will be used for initial comparison purposes, however because the groundwater at the site does not have a designated beneficial use under the Basin Plan, MCLs and NLs will not be used for decision-making purposes, other than to rule out COPCs."
9. Section 5.3, Data Quality Objectives, #4	The target population should include groundwater at the former UST area and the groundwater in relation to the septic systems.	In Section 5.3, #4 under "Define the Target Population of Interest," the target population has been revised to include groundwater sampled collected as part of the PEA Work Plan.
10. Section 5.3, Data Quality Objectives, #4	One practical constraint on collecting data may be scheduling activities around school operations.	In Section 5.3, #4 under "Determine the Practical Constraints on Collecting the Data," the text has been revised to "None expected. Depending on the timing of the work, sampling may need to accommodate the school calendar."

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Item	DTSC Comment	ENVIRON Response
11. Section 5.3, Data Quality Objectives, #5, Develop a Decision Rule	Revise to include evaluation and decisions related to groundwater. Concentrations of COPCs in groundwater in the former UST area may be compared to previously detected concentrations in this area. Concentrations of COPCs in the existing groundwater monitoring wells will be evaluated to determine groundwater quality.	See response to Specific Comment No. 8. Data Quality Objectives #5 has been revised to include groundwater.
12. Section 6.2. Paragraph 1 and section 6.2.5 (third paragraph)	Add sampling of selected existing groundwater wells.	The first paragraph of Section 6.2 has been revised to include sampling of monitoring wells MW-3 through MW-7, MW-10, and MW-11. The third paragraph of Section 6.2.5 also has been revised to include sampling of these same monitoring wells.
13. Section 6.2.3	DTSC has not determined the number or location of split samples that DTSC will collect. Revise this to read that DTSC may collect split samples during the PEA. Additionally, DTSC participated in developing procedures for split sampling for third parties (meeting attended by representatives of Malibu Unites, the SMMUSD, and Environ on June 16, 2014). It should be noted that the order of sample collection for any splits will be the primary samples to be collected by Environ first, any DTSC split samples would be collected second, any third party split samples would be collected third.	Comment noted. Section 6.2.3 has been revised to state "ENVIRON understands that DTSC will be collecting split samples for independent analysis. ENVIRON understands that other parties may wish to split samples for independent analysis. DTSC participated in developing procedures for split sampling for third parties (meeting attended by representatives of Malibu Unites, the SMMUSD, and Environ on June 16, 2014). The order of sample collection for any splits will be the primary samples to be collected by Environ first, any DTSC split samples to be collected second, any third party split samples to be collected third. Split samples will be analyzed for the same COPCs using the same analytical methods used for the original samples."
Tables		
14. Table 2	Revisions to Table 2 should be made as follows: AOI-2 - include groundwater sampling of monitoring wells MW-3 and MW-4. The analyses should include VOCs, SVOCs, TPH, and metals. The objective is to determine the groundwater quality. b. AOI-9 - include groundwater under the media and analysis columns. Under the objective column, include an objective for the groundwater samples, as in the DQO section. c. AOI-12 - include groundwater sampling of selected existing monitoring wells. The analyses should include VOCs, SVOCs, TPH, and metals. The objective is to determine the groundwater quality. d. AOI-18 - for the new student drop-off area, include pesticides, herbicides, and metals in the analyses column.	Comment noted. Table 2 has been revised accordingly.
15. Table 3 – Soil	Include Analytical methods and sample collection requirements for soil analyses for polychlorinated biphenyls, pH, and lead-only, in addition to those already present.	Comment noted. Table 3 has been revised accordingly.
16. Table 3 – Groundwater	Include rows for SVOC and metals analyses. Check consistency for the letter case on the motor oil abbreviations.	Comments noted. Table 3 has been revised accordingly.
17. Table 4C	Add sections for SVOC and metals analyses for groundwater.	Comment noted. Table 4C has been revised accordingly.

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Item	DTSC Comment	ENVIRON Response
Figures		
18. Figures 2, 4, 12, 16, and 17	Confirm the location of the retention basin. It is my understanding that the retention pond is located about 200 feet to the north northwest of the label shown on this figure.	Comment noted. The Figures have been revised accordingly.
19. Figures 7 and 8	Revise label for stockpile to read "former" stockpile.	Comment noted. The Figures have been revised to state "former soil stockpile."
20. Figure 13B	Change the map symbol for sample location SS-PERC-9 which is not a step-out location.	Comment noted. The map symbol for SS-PERC-9 has been changed.
Appendix H		
21. Field Sampling Protocols	Include a field protocol for installing and sampling the soil vapor probes.	In the PEA Work Plan, Section 6.2.2, for soil vapor probe installation and sampling, ENVIRON specified that "Each boring will be converted to a temporary multi-depth nested soil vapor probe in accordance with the California Environmental Protection Agency, Department of Toxic Substances Control, Los Angeles Regional Water Quality Control Board, and San Francisco Regional Water Quality Control Board *Advisory – Active Soil Vapor Investigations* (Advisory). Depths of soil vapor probes are summarized in Table 2 and may be adjusted depending on conditions encountered in the field. Soil vapor samples will be collected in accordance with the Advisory, dated April 2012." Procedures are specified in the Advisory and therefore, a field protocol is not needed.
22. Soil Sampling Protocol – Section 2.1.3, Incremental Sampling	The gridded areas are referred to as squares. They are likely not squares, but should be referred to as increments. A figure for all DU's should be included to show the grid nodes for the increments and the randomly selected sample locations. Item 3 under this section should reflect that the triplicate locations will be randomly selected from the initial sample increment for each DU. Additionally, the soil for each replicate within a **DU** will be placed in large polyethylene bags within coolers for transport to the laboratory.	The soil sampling protocol has been revised to refer to "increments" rather than squares and to indicate that triplicate sampling locations within each increment will be selected randomly. Figure 17 has been revised to depict the three DUs, increments, and sampling locations within each increment.
23. Soil Sampling Protocol – Section 3.1 Field Data Sheets	Two forms are referred to: the Field Investigation Daily Log and the Daily Field Record. **It** is not clear if these refer to one form or two different ones. Also, all samples for analyses will be recorded on a Chain-of-Custody (replace the word "may" unless samples will not be submitted to the lab).	Section 3.1 of the Soil Sampling Protocol has been updated accordingly.
24. Soil Sampling Protocol	Test America should define what a "T ALS" bench sheet is.	According to Test America (TA), TALS is TA's Laboratory Information System (LIM), which is a software system where data are entered into to provide reports. The TALS bench sheet refers to data entry portions of the TALS system such as initial weight, final volume, dilution factors, and observations.
25. Drilling and Destruction of Soil Borings Protocol – Section 5	The SMMUSD should inform Environ of all surface completion requirements for all boring locations.	Comment noted. SMMUSD informed Environ of all surface completion requirements for all boring locations.
26. "Low-Flow" Groundwater Sampling Protocol – Section 2	The link for Cal-EPA, 2008, "Representative Sampling of Groundwater for Hazardous Substances, Guidance Manual for Groundwater Investigations" is: https:lldtsc.ca.gov/SiteCleanup/upload/SMP_Representative_Sampling_GroundWater.pdf.	The link for Cal-EPA, 2008, "Representative Sampling of Groundwater for Hazardous Substances, Guidance Manual for Groundwater Investigations" provided by DTSC has been added to Section 2, Page 1, of the "Low-Flow" Groundwater Sampling Protocol.

Item	DTSC Comment	ENVIRON Response
27. Section 2.3	Include when sampling will proceed if drawdown occurs and flow rate cannot be adjusted low enough to prevent drawdown.	The following statement has been added to Section 2.3, page 2 of the "Low-Flow" Groundwater Sampling Protocol, included in Appendix H: "*In the event that the minimum purge rate for the pump reduces the water table more than 0.33 feet, purging will stop once drawdown of 0.33 feet has been achieved and the well allowed to recover for 15 minutes. Once two purge volumes has been removed, sampling may commence*. *Wells recharging at a slow rate should be sampled as soon as a sufficient volume of groundwater has entered the well to enable the collection of the necessary groundwater samples*."
28. Section 2.3	Stabilization criterion should be based on four consecutive readings per the 2008 Guidance; also, groundwater temperature should be included in the stabilization determination.	Page 3 of Section 2.3 has been updated accordingly.
29. Section 3	Ensure that the water level meters are appropriately decontaminated as well.	Page 6 of Section 3 already includes a paragraph on ensure appropriate decontamination of water level meter (also referenced as "*Water Quality Meter")*.
Appendix I		
30. Page 12, Task 1 and Task 3 (or 4)	Include groundwater sampling of existing selected wells.	Comment noted. The Health and Safety Plan (HASP) included in Appendix I has been updated accordingly.
Human and Ecological Risk Office Comments		
1. Page 23, Section 4.4.1.1	Former UST Removal Activities: Please clarify the statement In the 2nd paragraph, as only ethylbenzene (instead of BTEX.) concentrations in certain soil samples exceeded the USEPA residential regional screening levels (RSLs).	Confirmed that ethylbenzene was the only chemical exceeding the USEPA residential RSL. The text has been revised as follows: Based on ENVIRON's review of the available soil analytical data, concentrations of ethylbenzene in certain soil samples exceeded its current applicable USEPA residential regional screening level (RSL).
2. Page 27, Section 4.4.1.3	Human Health Screening Risk Evaluation: The post remedial calculation for the cancer risk in the previous health risk evaluation (Arcadis 2010) should be: 3×10^{-6} (i.e., three in a million) instead of 3×10^{6}, HERO also recommends deleting the following statement "… which is above the cancer risk target for school sites (1×10^{-6}) but below the DTSC cancer risk management range for school sites of 5×10^{-6}." Please note that DTSC makes risk management decisions for school sites in accordance with the requirements in the California Education Code and other relevant regulations and policies on a site-specific basis, and does not apply a "bright-line" risk target approach to all school sites.	Comment noted. ENVIRON revised the cancer risk to 3×10^{-6}, and deleted the statement specified in the DTSC comment.
3. Page 37, Section 5.2.1	Composite Sampling: It is DTSC's understanding that no historical operations or chemical uses besides pesticides/herbicides occurred in Area of Interest (AOI) 18. Thus the sampling in these proposed redevelopment areas is solely to assist the SMMUSD to determine if further evaluation is needed for soils that may be temporarily disturbed during grading activities.	Comment noted. The text has been revised to state, "Composite sampling results will be used to assist the District in deciding if further evaluation is needed for soils in areas subject to redevelopment where soils may be temporarily disturbed during grading activities."
4. Page 39	Data Quality Objectives: HERO recommends modifying item 5 "Develop decision rule (if…then…statement)" to include an evaluation of cumulative health effects of COPCs, besides comparing concentrations of individual COPCs with the screening levels, to determine need for further action.	Comment noted. The text has been revised as follows: If concentrations of COPCs are less than screening levels or background levels and cumulative cancer risks and non-cancer hazard indices are less than significant thresholds, then no further action is necessary. If concentrations of COPCs exceed screening levels or cumulative cancer risks and non-cancer hazard indices exceed significant thresholds, conduct additional evaluations as necessary to determine the need for remedial action.

Item	DTSC Comment	ENVIRON Response
5. Page 41, Section 6.2.4	Background Soil Sampling: HERO recommends that the following guidance documents be followed for upcoming evaluation of background metals concentrations: (a) Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments of Hazardous Waste Sites and Permitted Facilities (DTSC 1997), and Arsenic Strategies: Determination of Arsenic Remediation – Development of Arsenic Cleanup Goals (DTSC 2009)	Comment noted. The references recommended have been added to the text.
6. Page 43, Section 6.5	Analytical Testing: HERO recommends analyzing 5% of the soils samples proposed for PCBs analysis by USEPA Method 1668 for specific congeners. These samples should be collected from both campuses and cover the full range of PCB concentrations detected at the site. PCB congener data will be compared with those measured by USEPA Method 8082 to confirm the presence or absence of PCBs in soil matrix. In accordance with PEA Guidance manual (DTSC 2013), the HHRSE will be based on total PCB concentrations and assume that all PCB compounds are equivalent to Aroclor 1254.	Comment noted. The PCB congener analysis has been added to the Work Plan by adding the following sentences: "Approximately five percent of the soil samples selected for PCB analysis also will be analyzed for specific PCBs congeners by USEPA Method 1668. Soil samples will be analyzed from both campuses and cover the full range of PCB concentrations detected at the site. PCB congener data will be compared with those measured by USEPA Method 8082 to confirm the presence or absence of PCBs in soil matrix."
7. Page 47, Section 8	HHSRE: Besides the USEPA and DTSC Guidance listed in reference section, the following guidance documents may also be applicable for risk evaluation of PEA data collected at certain AOIs: (a) Interim Guidance – Evaluation of School Sites with Potential Contamination from Lead Based paint, Termiticides, and Electrical Transformers (DTSC 2006); and (b) Interim Guidance for Sampling Agricultural Fields (3rd Revision; DTSC 2008).	Comment noted. The references recommended have been added to the text and listed in Section 11.
8. Page 47, Section 8.1.2	Exposure Pathways: HERO recommends identifying the AOIs where concrete and other hardscape surfaces are present to prevent direct contact to soil by current receptors (i.e., school staff and students). Soil risks estimated for these areas are considered conservative unless surface pavement will be removed in the future.	Comment noted. The text has been revised by adding the following sentences: AOIs where concrete and other hardscape surfaces are present to prevent direct contact to soil by current school staff and students will be identified. Soil risks estimated for these areas are considered conservative unless surface pavement will be removed in the future.
9. Page 47, Section 8.1.2	Media of Exposure: As recommended by DTSC Project Geologist, groundwater sampling of selected existing wells should be included in the sampling plan. Thus, groundwater analytical data should be evaluated for relevant exposure pathways as appropriate (i.e., vapor intrusion if soil vapor data are not available or inconclusive) in the HHSRE.	See response to General Comment No. 1 related to sampling of selected existing monitoring wells. At all locations where monitoring wells will be sampled, there are nearby soil gas sampling locations. The soil gas sampling data will be used to evaluate the potential vapor intrusion pathway in the HHSRE.
10.Page 48, Section 8.1.3	Exposure Point Concentrations: HERO recommends calculating exposure point concentrations (EPCs) using shallow soil (0~2 ft bgs) data for evaluation of current school receptors. For hypothetical residential scenario, surface and subsurface soil data down to 10ft bgs, if available, should be evaluated assuming that soil may be re-graded during redevelopment	Comment noted. The text has been revised by adding the following sentences: EPCs calculated based on soil concentrations at 0-2 ft bgs will be used for evaluation of current school receptors. For hypothetical residential scenario, surface and subsurface soil data down to 10 ft bgs, will be used to calculate EPCs assuming that soil may be re-graded during redevelopment.
11.Page 49, Section 8.1.5	School-Based Scenario: HERO recommends using the Schoolscreen spreadsheet model developed by the Office of Environmental Health Hazard Assessment (http://oehha.ca.gov/public_info/public/kids.schools2604.html) to evaluate the school receptors including staff and students. Please note that toxicity values of some chemicals (e.g., oral slope factor for PCBs) in the Schoolscreen model are outdated, and the latest toxicity values from the sources identified in Section 2.5.2.5 Of the PEA Guidance Manual (DTSG 2013) should be used instead.	Comment noted. The Schoolscreen spreadsheet model will be used and the last paragraph of Section 8.1.5 has been updated accordingly.
12.Table 2	According to the description of the AOI, there are apparently three electrical transformers in the MHS campus. Thus, the proposed number (four) of soil borings for AOI-17 does not appear sufficient as two boring locations are recommended for each pad-mounted transformer (DTSC 2006).	Comment noted. The proposed number of soil borings for AOI-17 was revised to 6 and Table 2 has been revised accordingly.

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Item	DTSC Comment	ENVIRON Response
13.Table 3	The analytical methods and relevant requirements for PCBs soil samples should be included in the table. For TPH in soil, the specific analysis should be USEPA Method 8015M, according to Section 6.5.	Comment noted. Table 3 has been revised by adding USEPA Method 8082 for PCBs and USEPA Method 1668 for PCB congeners in soil. The method for TPHs in soil will be revised to 8015M.
14.Figure 18	HERO recommends modifying the Conceptual Site Model diagram to include ingestion of vegetables/fruits that may be grown in Cornucopia (AOI 15) as a potentially complete exposure pathway. Depending on the quantity of vegetables/fruits consumed by staff/students and chemical concentrations in the soil samples collected from this area, DTSC will determine if this pathway should be evaluated in the HHSRE.	As discussed with DTSC, ENVIRON will work with the School District to determine the quantity of vegetables/fruits consumed from Cornucopia. Based on this information and the chemical concentrations in the soil samples, DTSC will determine if ingestion of fruits/vegetables should be evaluated in the HHSRE.

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Final Preliminary Environmental Assessment Work Plan

Juan Cabrillo Elementary School and
Malibu Middle and High Schools
30237 and 30215 Morning View Drive
Malibu, California

Prepared for:
Santa Monica-Malibu United School District
Santa Monica, California

Prepared by:
ENVIRON International Corporation
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Date:
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Project Number:
0433980A

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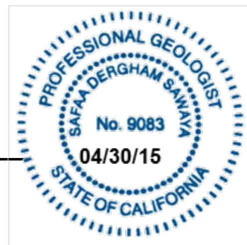
List of Appendices

List of Acronyms

Acronym	Definition
amsl	above mean sea level
AOI	Area of Interest
APN	Assessor's Parcel Number
BTEX	benzene, toluene, ethylbenzene, and xylene
COPC	Chemical of Potential Concern
DOGGR	Department of Oil, Gas and Geothermal Resources
DOT	Department of Transportation
DQO	data quality objective
DTSC	Department of Toxic Substances Control
EDR	Environmental Data Resources
EPC	Exposure Point Concentration
ESA	Environmental Site Assessment
FUDs	formerly used defense sites
HASP	Health and Safety Plan
HHRA	Human Health Risk Assessment
HHSRE	Human Health Screening Risk Evaluation
HI	hazard index
JCES	Juan Cabrillo Elementary School
LACDPW	Los Angeles County Department of Public Works
LACFD	Los Angeles County Fire Department
LACSD	Los Angeles County Sanitation District
LARWQCB	Los Angeles Regional Water Quality Control Board
LBP	Lead-based paint
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
MHS	Malibu Middle/High School
MS	matrix spike
MSDS	Material Safety Data Sheet
MSD	matrix spike duplicate
pCi/L	picoCuries per liter
PCB	polychlorinated biphenyl
PCG	Preliminary Cleanup Goal
PCH	Pacific Coast Highway
PE	Professional Engineer
PEA	Preliminary Environmental Assessment
PG	Professional Geologist
PHI	Public Health Investigation
QA/QC	Quality Assurance/Quality Control
RCHHSL	Residential California Human Health Screening Level
REC	recognized environmental condition
RSL	United States Environmental Protection Agency Regional Screening Level
SCAQMD	South Coast Air Quality Management District
SMMUSD	Santa Monica Malibu Unified School District

Acronym	Definition
SOPs	Standard Operating Procedures
SSSL	Site-specific Screening Level
SVOC	Semi-Volatile Organic Compound
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons-diesel
US	United States
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Society
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WDR	Waste Discharge Requirement

Prepared By:



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1 Introduction

ENVIRON International Corporation (ENVIRON) has prepared this final Preliminary Environmental Assessment Work Plan (PEA Work Plan) on behalf of the Santa Monica/Malibu Unified School District (District), in response to the State of California Department of Toxic Substances Control (DTSC) Voluntary Investigation Agreement (the Agreement) between DTSC and the District, which was executed on March 13, 2014[1]. The Agreement addresses Juan Cabrillo Elementary School (JCES) and Malibu Middle/High School (MHS; the middle and high schools are on the same property, which comprises MHS), located at 30237 and 30215 Morning View Drive, respectively, in the city of Malibu, Los Angeles County, California (collectively, "the site", Figures 1 and 2). The Agreement was executed with the express purpose of conducting a PEA at JCES and MHS to evaluate the environmental condition of soils at the site and the potential need for further remediation to allow for future unrestricted use of the site. In the event that DTSC finds that additional site characterization and/or remediation of the site is required, such activities will be conducted pursuant to a Voluntary Cleanup Agreement.

Between 2009 and 2011, and predicated on the District's development plans for MHS, a Phase I Environmental Site Assessment (Phase I ESA) was performed at MHS on September 17, 2009. The Phase I ESA identified five "recognized environmental conditions" (RECs), out of which three were located in areas planned for redevelopment. These three areas were addressed in a Preliminary Environmental Assessment report prepared by Arcadis, dated June 14, 2010 (Arcadis PEA). The Arcadis PEA included shallow soil and soil vapor sampling in areas identified as RECs that were proposed for future redevelopment. Pesticides and polychlorinated biphenyls (PCBs) were detected in soils in several areas sampled at concentrations that exceeded the Arcadis-specified preliminary cleanup goal (PCG). Arcadis implemented a removal action during the summer of 2011 that included excavation and disposal of soil containing pesticides and PCBs.[2] The District did not request regulatory oversight for the environmental investigations and remediation at MHS because the District was not using State funds for the planned improvements and therefore, DTSC's involvement was not required.

In 2013, as part of the planned redevelopment, the District conducted trenching inside the southern portion of Building E of MHS to accommodate new fiber optic lines. Subsequent to the completion of the trenching, several parents and/or teachers expressed concerns regarding environmental conditions at MHS. In response to the concerns raised, interior portions of MHS were investigated. The results of these additional investigations are provided on the District's website. Due to community concerns, coupled with the District's desire to conduct any additional subsurface investigations under appropriate regulatory oversight, the District and DTSC

[1] The draft Preliminary Assessment Work Plan was submitted to DTSC on May 23, 2014, and was revised after receipt of comments from DTSC on June 27, 2014. This PEA Work Plan contains the revisions requested by DTSC in its June 27, 2014 comments, as described in ENVIRON's "Response to DTSC's June 27, 2014 Comments," dated October 10, 2014.

[2] Preliminary Environmental Assessment Report, Malibu Middle and High School Campus Improvement Project, 30215 Morning View Drive, Malibu California, prepared by ARCADIS, dated June 14, 2010.

Removal Action Work Plan, Malibu Middle and High School Campus Improvement Project, 30215 Morning View Drive, Malibu, California, prepared by ARCADIS, dated August 5, 2010.

Removal Action Completion Report, Malibu Middle and High School Campus Improvement Project, 30215 Morning View Drive, Malibu, California, prepared by ARCADIS, dated June 12, 2012.

executed the Agreement. Per the Agreement, DTSC has assumed regulatory oversight of subsurface investigations at JCES and MHS. The United States Environmental Protection Agency (USEPA) oversees action related to building materials (specifically PCBs in building materials). Therefore, this PEA Work Plan does not include any discussion of the detection and/or potential occurrence of chemicals in building materials and addresses only the subsurface at JCES and MHS.

1.1 Scope and Purpose

The scope of work to be conducted under the Agreement includes the following (as specified in Exhibit C of the Agreement):

- Review existing data and prior site remediation reports;
- Conduct a scoping meeting;
- Prepare a PEA Work Plan incorporating sampling procedures (Section 6), quality assurance/quality control (QA/QC, Section 7.2), and including a Health and Safety Plan (HASP, Appendix I);
- Conduct the PEA investigation;
- Prepare the PEA Report; and
- Facilitate public participation throughout the PEA, including a community survey, community interviews, fact sheets, work notices, and meetings.

This PEA Work Plan has been developed to address the elements of the described scope of work. The work described herein will be conducted after receipt of approval from the DTSC, and in a manner that minimizes potential disruption to the school community.

1.2 Objectives

The main objectives of the investigations to be conducted under the PEA Work Plan are to:

- Assess the potential for the presence of hazardous substances in areas at the site related to current and historical known and/or suspected site uses, including areas previously identified by Arcadis;
- Identify and evaluate potential “Areas of Interest” (AOI), including those identified by Arcadis, and areas where future planned redevelopment may temporarily disturb soils;
- Evaluate groundwater characteristics using data from existing groundwater monitoring wells, including depth to groundwater, groundwater elevations, and gradient.
- Evaluate groundwater quality in proximity to septic systems 1, 3, 5, and 8, and in the area of the former underground storage tanks (USTs) at the MHS Bus Barn.
- Estimate the potential health risks associated with exposure to chemicals detected in the subsurface at the site; and
- Evaluate the need for further investigation and, if necessary, remediation to reduce an existing or potential risk to public health and/or the environment.

The PEA process is designed to engage the community by facilitating community input and providing for the informational needs of the community. As a result, as discussed in Section 2, public participation activities will be conducted.

1.3 Work Plan Organization

This work plan has been prepared in general accordance with DTSC's guidance entitled *"Preliminary Endangerment Assessment Guidance Manual,"* (Interim Final – Revised October 2013), and is comprised of the following sections:

Section 1:	Introduction
Section 2:	Public Participation
Section 3:	Site Setting
Section 4:	Background
Section 5:	PEA Work Plan Rationale
Section 6:	Scope of Investigation
Section 7:	Data Evaluation
Section 8:	Human Health Screening Risk Evaluation
Section 9:	Reporting
Section 10:	Schedule
Section 11:	References

In this PEA Work Plan, Section 6 contains the elements of a sampling plan and Section 7.2 contains the elements of QA/QC.

2 Public Participation Activities

Prior to and during implementation of the PEA, DTSC will conduct community outreach through a variety of avenues. The main goals of the outreach are to: (1) understand and document community interests, views, and concerns regarding subsurface conditions at the schools; (2) ensure that the community is informed and has access to DTSC personnel; and (3) keep the community informed of scheduled fieldwork and the overall progress of the PEA. ENVIRON will provide assistance to DTSC to accomplish these goals. Activities that will be conducted to achieve these goals are described in the following sections.

2.1 Develop Site Mailing List/Contacts

A mailing list was developed for the site so that information can be readily dispersed to all community members. The mailing list is comprised of school employees; parents; residences/businesses within ¼-mile of the schools; and key government/regulatory officials. The names, addresses, and email addresses of school employees and parents of all students currently attending the schools were provided by the District. Addresses for residents/businesses within ¼-mile of the schools were provided by a private mailing service. The names and addresses of key government officials were provided by DTSC. These various lists were compiled into one comprehensive list for mailing purposes. Email is preferred, followed by United States (US) Mail if email addresses are not available or emails are returned.

2.2 DTSC Community Survey

DTSC and ENVIRON developed a community survey to receive feedback about the level of interest in and concerns regarding the site. The community survey was provided in English and Spanish. On Thursday, April 3, 2014, 1,297 surveys were distributed to the community; 1,134 via email and 163 via US Mail. Surveys were requested to be completed and returned to DTSC by Friday, April 25, 2014. As of May 1, 2014 DTSC had received 39 responses. A summary of the responses is provided in Appendix A.

2.3 DTSC Community Interviews with Key Stakeholders

To help DTSC understand community questions and concerns, DTSC will conduct interviews with community members including parents, teachers, representatives of Malibu Unites, school officials, and Board members. Information gathered from the interviews will be made available on DTSC's EnviroStor website.

2.4 DTSC Community Profile

According to information provided on the US Department of Commerce, US Census Bureau website (http://quickfacts.census.gov), the 2012 population estimate for Malibu was 12,832 people. In 2010, 87.4% of the population was classified as White alone (not Latino), 2.6% was classified as Asian alone, and 6.1% was classified as Latino. During the time period from 2008-2012, 85.4% of the population had lived in the same dwelling for one year or more. During this same time interval, 98.3% of the population (25 years and older) had at least a high school education. The median household income was calculated at $135,330 with approximately 8.6% of the population living below the poverty level.

Malibu is a general law city and operates under the council-manager form of government. The five-member City Council is elected at-large to serve four-year terms. The Mayor's Office is rotated annually among all councilmembers. The City Council hires a city manager to carry out policies and serve as executive officer. The current mayor is Skylar Peak, and the mayor *pro tem* is John Sibert. The remaining city council members are Joan House, Lou LaMonte, and Laura Rosenthal.

There is a high level of interest pertaining to potential environmental issues at the schools. Based on community responses received as of May 1, 2014, many residents read the Malibu Times, the local community newspaper. Survey respondents also mentioned Malibu Unites as a grass roots organization that has strong interest in preserving a safe and healthy school environment. In addition, the Public Employees for Environmental Responsibility organization expresses its views on behalf of 29 teachers and staff at JCES and MHS.

2.5 PEA Fact Sheet/Meeting Notice

DTSC will prepare community notices at key milestones (e.g., prior to commencement of PEA fieldwork, prior to issuance of the PEA report) to provide the community with information about the plans for, progress of, and findings of the PEA. The first community notice will be an initial fact sheet, describing the background of the site, the PEA process, and the plans/schedule for a community meeting. Ensuing notices will be prepared prior to fieldwork and will describe the types and duration of the fieldwork, locations of fieldwork, and planned schedule. Additional community notices may be provided, as needed, to communicate the results of the PEA and/or advise of additional community meeting

Community notices will be provided in English and Spanish. Notices will be distributed to all parties on the email and mailing list and to the document repositories as listed in section 2.8 below.

2.6 DTSC Community Workshop

DTSC will schedule an informal community workshop to communicate the content of this work plan to the interested community members. The purpose of the workshop is to communicate enough information so that the community will have a good understanding of the content of and rationale for the sampling proposed during the PEA. The community will be able to interact directly with DTSC to voice its questions, suggestions, and comments. The workshop will take place in June 2014.

2.7 Biweekly Updates

ENVIRON will prepare updates regarding the progress of the PEA on a regular basis. Updates will be prepared every two weeks and submitted to the District and DTSC, and will be posted on the District's website and on EnviroStor. Updates will include a short description of work completed over the two weeks prior to the date of the update and activities planned for the upcoming two-week period. If significant deviations from planned schedules occur, the updates also will provide the revised schedule.

2.8 Document Repositories

DTSC will make documents prepared as part of the PEA available to the public electronically and in hard copy. Documents provided to the document repositories will include community and public notices, fact sheets, work plans, and reports. Electronic copies of prepared documents will be posted to the District's website and on DTSC's EnviroStor database (http://envirostor.dtsc.ca.gov/public/). Hard copies of prepared documents will be placed in two document repositories:

- Malibu High School Library
  30215 Morning View Drive, Malibu, California
  Hours of operation are coincident with school hours

- Malibu Library
  23519 Civic Center Way
  Malibu, California
  (310) 456-6438
  Hours of operation: M-W, 11 am to 8 pm; Thurs 11 am to 6 pm;
  Fri and Sat, 11 am to 5 pm; Sun, 1 pm to 5 pm

The repositories will be updated as documents become available throughout the PEA process.

2.9 Ongoing Community Outreach

An email address has been established, specific to the schools, to allow the community to express its concerns, questions, and/or views, 24 hours a day. This email address is SMMUSDEnvironmentalInput@Environcorp.com. Any emails sent to this address will be received and reviewed by ENVIRON. Received emails pertaining to the PEA also will be forwarded to DTSC for consideration.

DTSC may conduct outreach activities in addition to those described above. DTSC will provide updates to the local community; send out additional community notices, letters, flyers, or postcards; or conduct door-to-door outreach to ensure that the community is kept informed of the status of the site. DTSC will also consider conducting other outreach activities as suggested by community members.

3 Site Setting

The site, which is comprised of JCES and MHS, is located in the Zuma Beach Area, in the City of Malibu, on the southern flank of the western portion of the Santa Monica Mountains. JCES is located at 30237 Morning View Drive and MHS is located at 30215 Morning View Drive (Figure 2), 0.2 miles north of Pacific Coast Highway (PCH). The terrain generally consists of rolling hills with a maximum topographic relief of approximately 90 feet and elevations ranging from approximately 80 to 170 feet above mean sea level (amsl). The topography at the site and its vicinity slopes gently southwesterly to the Pacific Ocean. Land in the vicinity of the site consists of rural residential and recreational properties. Detailed descriptions of JCES and MHS are presented in the ensuing sections.

3.1 Juan Cabrillo Elementary School

JCES is comprised of approximately 6.4 acres, consisting of seven buildings (Buildings A through G and the Multi-Purpose Room/Cafeteria), and two trailers used for childcare (Figures 2 and 3). Most of JCES was built between the late 1950s and the early 1960s, except for the Multipurpose Room/Cafeteria and the childcare trailers, which were built in 1995 and 1992, respectively. The main playground located in the northern portion of JCES consists of asphalted areas, a grassy field, and two sandboxes. The drop-off area is located along Morning View Drive, south of the buildings. Staff parking is located on the west side of the school, west of the Building A (Office) and the Multi-Purpose Room/Cafeteria. Most areas around the buildings are bordered with an approximate 8- to 10- foot wide concrete walkway and a concrete and/or vinyl siding overhang. Buildings A, D, and F are bordered by a planter to the south, north, and west, respectively. Buildings B and C, and D are separated by planter/garden areas that are used by students and staff for outdoor education such as gardening, farming, and recreation.

3.2 Malibu Middle/High School

MHS is comprised of approximately 80 acres (including areas leased to others) and is currently improved with multiple permanent and temporary structures and various recreational facilities, including a pool and several sports fields (Figures 2 and 4). MHS consists of many buildings (Buildings A through K, and New Gymnasium). Construction of most of the buildings occurred in the 1960s, except for Building K and the New Gymnasium, which were built in 2002. Similarly to JCES, most buildings at MHS are bordered by an approximately 8- to 10- foot wide concrete walkway and a concrete and/or vinyl siding overhang. Two large metal barn-like structures that are used for equipment storage and vehicle maintenance, including a bus washing station (“Bus Barn”) are located in the northwestern portion of MHS. An outdoor concrete amphitheater is located north of Building I and east of Building G.

The swimming pool and athletic fields are located on the north and northeastern half of MHS. The area east of the athletic fields is mostly undeveloped. The District owns and leases three areas to other parties: 1) a green house and garden area located in the northwestern portion of the MHS, which is referred to as Cornucopia, 2) The Boys and Girls Club located adjacent and northeast of the swimming pool, and 3) a portion of the Malibu Equestrian Center, located southeast of the MHS buildings (Figure 4).

3.3 General Use/Ownership

The site is owned by the District and is used for educational purposes.

3.4 Location

The site is located in the Zuma Beach Area, in the City of Malibu, California and is zoned for institutional use. JCES incorporates 6.4 acres of Assessor's Parcel Number (APN) 4469-017-900. MHS is comprised of approximately 80-acres and APNs 4469-017-900 (out of which 6.4 acres are shared with JCES), 4469-017-901, 4469-017-902, and 4469-017-903. The following are located in the general vicinity of the site (Figure 2):

- To the north and west: residential properties;
- To the south: across from Mountain View Drive, is the Malibu United Church and Nursery School. Zuma Beach and the Pacific Coast Highway are located approximately 1,000 feet and 1,500 feet south of the Site; and
- To the east: residential properties and the Malibu Equestrian Center.[3]

3.5 Climate

The site is located within California Climate Zone 9. Average high temperatures in January and July in Malibu are 64 degrees Fahrenheit (ºF) and 70ºF, respectively. Average low temperatures in January and July are 51 ºF and 63 ºF, respectively (Arcadis, 2010). The majority of the area's precipitation occurs in the winter, during the months of January and February, with an average of 11.9 inches per year (www.weather.com).

3.6 Regional Geology and Hydrogeology

According to the Environmental Impact Report developed for the site (Atkins, formerly PBS&J, 2011), the site is located in the narrow, terraced coastal strip separating the present day beach from the Santa Monica Mountains within the Transverse Ranges province. Several north-dipping active thrust faults are located in the vicinity of the site including the Malibu Coast and Anacapa Dume Faults. The Anacapa Dume Fault marks the structural boundary of the Transverse Ranges province approximately three miles offshore from Point Dume. Both faults consist of slanted, north-dipping shear planes, accommodating north-over-south crustal shortening (compressional stresses). The main faults that intersect the site are illustrated on Figure 5.

The Santa Monica Mountains expose a thick sequence of Cretaceous-age (approximately 166 to 65 million years old) and younger sedimentary and extrusive igneous rocks. The sedimentary rocks include sandstones, siltstones, and mudstones. The volcanic rocks include sub-aerial and sub-aqueous flows, breccias, and tuff. In the vicinity of the site, at least 4,500 to 5,000 feet of mostly marine sediments overlie crystalline metamorphic basement rock. There are three marine terraces in this area of the coastal strip with variable elevations ranging from 100 to 250 feet amsl. These terraces represent wave-cut platforms incised into bedrock or older surficial deposits and are capped with marine shore deposits and non-marine stream terrace and debris flow deposits. The site is located on the middle of these three terraces, where most

[3] The Malibu Equestrian Center leases property from the District.

of the terrace surface has been dissected by erosion with subsequent deposition of gravel, sand, silt, and clay within the eroded channel.

3.7 Local Geology and Hydrogeology

Geology

Based on previous subsurface investigations conducted at the site and the United States Geologic Society (USGS) Geologic Map (Yerkes and Campbell, 2005), the geology beneath the site consists of two main units: the Young Non-Marine Terrace Deposits (Qyd) and the Monterey Shale (Tmt). These geologic units are illustrated on Figure 6 and are further described below:

Young Non-Marine Terrace Deposits

This unit consists primarily of very stiff to stiff silty to sandy clay, interbedded with bedrock clasts. Non-marine terrace deposits are encountered from the surface or below surface fill to a maximum depth of 20 feet below ground surface (bgs) (Leighton, 2009).

Monterey Shale

Interbedded claystone and siltstone of the Monterey Shale formation are encountered at depths ranging from 10 to 20 feet bgs (Leighton, 2009). The unit is described as light brown, moderately hard to hard, fractured, oxidized, and weathered, with calcite staining.

Two other geologic units are exposed at the site: the Trancas Formation (Tr) and Zuma Volcanics (Tz). The Trancas Formation is aerially limited to a small portion on the northwest corner of the site. The Zuma Volcanics geological unit is sporadically exposed in the north-northeastern half of the site and appears to contact with the Young Non-Marine Terrace and the Monterey Shale in the center of the site.

Hydrogeology

The site is within the Malibu Hydrological Unit and the Truncas Canyon Hydrologic Sub-Area (Los Angeles Regional Water Quality Control Board [LARWQCB], Basin Plan). There is no groundwater basin designated in the area of the site and groundwater is not assigned any beneficial uses according to the Basin Plan. Zuma Beach Coastal Waters are designated for recreational uses. The site is bounded to the northwest by an ephemeral stream, designated by the City of Malibu as an Endangered Species Habitat Area (ESHA).

Eleven monitoring wells currently are present at the site (MW1 through MW-11; see Figures 3 and 4) to monitor the septic systems as part of the site's Waste Discharge Requirement (WDR) permit, authorized by the LARWQCB. According to the "*4th Quarter 2013 Monitoring Report for Malibu High School, Malibu Middle School, and Juan Cabrillo Elementary School,"* by Ashirt Engineering Inc., dated January 14, 2014, groundwater at the site was encountered at depths ranging from approximately 51 to 62.7 feet bgs. Data from subsurface investigations conducted by Ocean Blue Engineers (1996) indicate that groundwater beneath the northwestern portion of the site, near the Bus Barn, flows to the southwest, toward the Pacific Ocean. The first encountered groundwater at the site is likely perched.

4 Background

The following sections present the steps taken to obtain historical and current information to evaluate existing environmental conditions at the site. The process includes conducting site visits and interviews to assess current conditions and reviewing topographic maps, aerial photographs, and agency files to evaluate historical activities conducted at the site.

4.1 Information Sources

ENVIRON visited and/or reviewed the following sources to identify current and historical site uses and operations:

- Reconnaissance visits to the site were conducted on March 6, April 1, and May 7, 2014 to observe the exterior and interior features of the site, locate areas reported as RECs in the Phase I ESA prepared for the MHS by Arcadis (Arcadis 2009), and to observe planned future redevelopment areas. Photographs taken during the site visits are included in Appendix B.
- Interviews during the site visit with the following employees: Mr. Terry Kamibayashi, District Facilities Technician and Mr. Terance Venable, Manager of Operations and Grounds. The aforementioned employees are referred to herein are "as facility personnel." The facility personnel interviewed by ENVIRON were identified by the District as having knowledge of the current uses and physical characteristics of the site.
- Interviews conducted with JCES and MHS employees on May 21, 2014.
- A review of information contained in federal and state environmental databases, as obtained from a radius report prepared by Environmental Data Resources, Inc. (EDR, see Appendix C), which presents the results of searches of federal and state databases for the site, as well as properties near the site.
- A review of standard historical sources to develop a history of previous uses at the site and surrounding area. The following resources were reviewed: historical topographic maps, aerial photographs, and Sanborn Maps. Historical topographic maps and Sanborn Maps were requested from Environmental Data Resources (EDR). Historical aerial photographs and historical photographs and other historical information were inquired and obtained from the following sources:
  - EDR;
  - DTSC's discussions with community members;
  - United States Army Corps of Engineers;
  - Department of Oil, Gas, and Geothermal Resources (DOGGR);
  - Los Angeles Public Library;
  - University of California, Los Angeles Spence & Fairchild Collections;
  - Malibu Public Library;
  - Pepperdine University;

- Los Angeles City Archives;
- City of Malibu;
- Former Malibu Historical Society;
- Malibu Lagoon Museum;
- United States Department of Agriculture; and
- National Archives.

- A review of local agency files to evaluate historical subsurface investigations and potential environmental concerns. The following agencies were contacted:
  - Los Angeles County Public Health Investigator (PHI);
  - DTSC Cypress and Chatsworth Offices;
  - Los Angeles County Fire Department (LACFD);
  - Los Angeles County Department of Public Works (LACDPW);
  - Los Angeles County Sanitation District (LACSD);
  - City of Malibu Environmental Programs (City);
  - City of Malibu Building Department (City Building);
  - State of California – Division of State Architects (State);
  - LARWQCB; and
  - South Coast Air Quality Management District (SCAQMD).
- A review of information received at ENVIRON's SMMUSDEnvironmentalInput email address, including a summary of interviews conducted by Ms. Cindy Vandor. ENVIRON also spoke with Mr. David Solinger regarding his experience at army depots and Mr. Ron Fleishman of the World War II Museum in Oxnard. Neither of these individuals reported knowledge of historical military uses of the Malibu area, and specifically the land comprising the site.
- A review of documents provided to ENVIRON by the District including facility prepared plans and procedures and material safety data sheets (MSDSs) for products (e.g. maintenance chemicals, pesticides, rodenticides, herbicides) used at the site. In addition, ENVIRON reviewed the following environmental assessment reports and other documents:
  - SMMUSD ES Reconstruction Program, Report of Additional Site Assessment Activities, by Cape Environmental Management, dated February 18 1993.
  - Workplan to Assess Malibu Park High Site Closure Permit No 9285B, by Cape Environmental Management, August 2 1993.
  - Additional Data Regarding Water Depth in the Vicinity of Malibu Park School, Malibu, California, by Ocean Blue Engineers, Inc., August 4, 1993.

- Subsurface Investigation by Drilling Four Borings and Soil Sampling, and Possible Installation, Development and Sampling of Four Groundwater Monitoring Wells at Malibu Park School, Malibu, by Ocean Blue Engineers, Inc. California, dated April 4, 1994.
- Background Information and Specifications for Subsurface Investigation by Drilling Four Borings and Soil Sampling, and Possible Installation, Development and Sampling of Four Groundwater Monitoring Wells at Malibu Park School, Malibu, California, by Ocean Blue Engineers, Inc., dated July 27, 1994.
- Interim Report of Groundwater Monitoring Well Installation and Site Assessment Report at 30215 Morning View Drive, Malibu, California, by Vector Three Environmental, Inc., dated December 7, 1995.
- Summary Report of Previous Site Investigations and Closure Requests for Malibu Park School Located at 30215 Morning View Drive, Malibu, California, Ocean Blue Engineers, Inc., dated August 21, 1996.
- Destruction of Four Groundwater Monitoring Wells at Malibu Park School Located at 30215 Morning View Drive, Malibu, California, by Ocean Blue Engineers, Inc., dated November 5, 1996.
- Consultation Regarding Floor Slab Moisture, Existing Building E, Malibu High School, 30215 Morning View Drive, Malibu, California, by Law/Crandall, Inc., dated 1994.
- Facilities Area Survey, Malibu High School, and Juan Cabrillo Elementary School, by Malibu High School, dated March 1, 1999.
- Award of Bid #3.05 Energy Efficiency Lighting Retrofit Project – Phase III – Malibu High School, by Santa Monica Malibu Schools, dated October 28, 2005.
- Building Sewers to Septic System, Malibu High School and Juan Cabrillo Elementary School, by D. Lewis Company, dated January 28, 2009.
- Scope of Work, Seepage Pit Backfill, by Topanga Underground, dated July 30, 2009.
- Final Percolation Test Data - Seepage Pits, Revised Seepage Pit Depths, by Topanga Underground, August 25, 2009.
- Draft Phase I Environmental Site Assessment, Malibu Middle and High School Campus, 30215 Morning View Drive, Malibu, California, prepared by LFR, dated September 17, 2009.
- Preliminary Environmental Assessment Report, Malibu Middle and High School Campus Improvement Project, 30215 Morning View Drive, Malibu California, prepared by ARCADIS, dated June 14, 2010.
- Removal Action Work Plan, Malibu Middle and High School Campus Improvement Project, 30215 Morning View Drive, Malibu, California, prepared by ARCADIS, dated August 5, 2010.
- Santa Monica – Malibu Unified School District, Malibu Middle and High School Campus Improvement Project, Environmental Impact Report, prepared by Atkins, formerly PBS&J, July 2011.

- Removal Action Completion Report, Malibu Middle and High School Campus Improvement Project, 30215 Morning View Drive, Malibu, California, prepared by ARCADIS, dated June 12, 2012.
- Summary of Indoor Environmental Quality, Electromagnetic Fields, and Radon Monitoring Results, Malibu High School, Malibu Middle School, and Juan Cabrillo Elementary School, dated November 2013.
- 4th Quarter 2013 Monitoring Report for Malibu High School, Malibu Middle School, and Juan Cabrillo Elementary School," by Ashirt Engineering Inc., dated January 14, 2014.

4.2 Current Site Use

The site currently is occupied by JCES and MHS (Figure 2). JCES is the smaller of the two schools and is located west of MHS. Construction of JCES was initiated in late 1950s and the school was completed in its current configuration in 1995. Construction of MHS was initiated in the early 1960s and the school was completed in its current configuration in 2002. Since construction, the site has been used for educational purposes. The District leases three areas at the site to various entities: a green house and garden area located in the northwestern portion of the property that is referred to as Cornucopia; The Boys and Girls Club located in the central portion of MHS, northeast of the swimming pool; and the Equestrian Center, located in the southeast portion MHS. Fencing separates the Equestrian Center from MHS. The layout of JCES is presented on Figure 3 and the layout of MHS is presented on Figure 4.

Groundwater underlying the site is not used for drinking water. Drinking water at the site is supplied by the Metropolitan Water District of Southern California (MWDSC). The site is not served by any public sanitary sewer systems and uses septic systems.

4.2.1 Site Visit Observations

Site visits were conducted on March 6, April 1, and May 7, 2014. Photographs taken during the site visits are included in Appendix B. During these site visits, ENVIRON observed the following:

JCES

ENVIRON walked the entire school and observed both the exteriors and interiors of the buildings. Areas around the buildings typically are bordered with an approximate 8- to 10-foot wide concrete walkway and a concrete and/or vinyl siding overhang. Buildings A and D are bordered by a planter to the south and to the north, respectively. ENVIRON observed the playgrounds (grassy play area and adjacent sandbox playground) and the interior garden areas located between Buildings B, C, and D, as depicted on Figure 3.

In Building F, ENVIRON observed the interior of Room 21 and Room 22 (Art Room), which contained paint, glue, collage materials, and aerosol fixative. In Room 23, the Science Laboratory, ENVIRON observed aquariums, desks, televisions, and microscopes. There was no obvious visual evidence of chemical use.

Three septic tank areas that service JCES (Septic Tanks 7, 8, and 9) were observed. Septic Tank 7 is located in the northern end of the staff parking and is connected to three leach pits; Septic Tank 8 is located south of Building F and is connected to a leach field; and Septic Tank 9 is located south of the childcare trailer and is connected to one leach pit. Four monitoring wells (MW-1 through MW-4) are located in the vicinity of the septic systems. These monitoring wells were installed between March 28 and April 6, 2009 during an evaluation and upgrades of the existing septic system (GeoConcepts 2009) as part of the WDR permit, and are monitored quarterly under oversight of the LARWQCB.

One electrical transformer was observed west of Building A. The transformer is situated on a concrete pad on soil/grass. The transformer was manufactured in 2010 and replaced an older transformer (See Photo 30). The transformer appeared to be in good condition with no obvious visual evidence of releases (e.g. staining) on the adjacent concrete.

MHS

ENVIRON walked the entire school and observed both the exteriors and interiors of the buildings. Similarly to JCES, most buildings at MHS are bordered by an approximately 8- to 10-foot wide concrete walkway and a concrete and/or vinyl siding overhang. There are two main grassy areas: the Middle School Quad and the High School Quad, which are separated by Building D. An outdoor concrete amphitheater is located north of Building I and east of Building G. The basketball courts and the swimming pool are located north of the amphitheater, beyond which are the athletic fields.

In Building D, the Biology Laboratory (Room 105) appeared orderly with no obvious visual evidence of significant chemical storage (Photos 16 through 18). In Building G, in the Art Room, ENVIRON observed stored glazes and powders containing silica and one sink with a drain (Photos 32 – 35). In the Ceramic Room and the Woodshop, ENVIRON observed two kilns; one electric and one gas, both vented to the outside, with floor drains that reportedly discharge into Septic Tank 1. Inside the Woodshop (Room 506), ENVIRON observed electrical saws and lathes and a spray booth manufactured by Spray King (Room 506D) (Photos 42 through 48). All equipment appeared to be in good condition. Significant staining was not observed around any equipment.

Adjacent to Building K, the Science Building, ENVIRON observed an in-ground chemical neutralization tank that holds waste discharged from the chemistry laboratories in the Science Building (Photo 30). In Building I, ENVIRON observed the Photo Laboratory (Room 402), with a dark room and a sink with floor drain that reportedly discharges to Septic Tank 1(Photos 38 and 39). Overall, ENVIRON did not observe obvious visual evidence of spills or leaks of stored chemicals.

Building H, the food service (kitchen) is located south of Building K. ENVIRON observed several sinks and two drains that reportedly discharge to Septic System 4. Inside the kitchen in Building H are two large freezers that use Freon. During the site visit, the kitchen was observed to be clean and well maintained (Photo 27). West of the food service/kitchen building, ENVIRON observed one emergency generator situated on a concrete pad on asphalt within a concrete blockwall enclosure (Photo 67) and one electrical transformer, manufactured in 2000, situated on a concrete pad on soil/grass (Photos 68 and 69). The emergency generator and transformer appeared to be in good condition, with no obvious visual evidence of releases (e.g. staining) on adjacent concrete or soil.

In the swimming pool area, two portable storage units were observed for utility cart storage. The swimming pool's pump room stores containers of hydrochloric acid, sodium hypo-chlorite, and chlorine, on concrete. ENVIRON observed some etching of the concrete outside the pump room (Photo 52). An 8,000-gallon poly tank, which is used to collect backwash, is located in an underground vault adjacent to the pump room.

ENVIRON observed the football field, baseball field, softball field, tennis courts, and soccer fields, which are all located on the eastern portion of MHS (Photo 56). Northwest of the basketball courts, ENVIRON observed the Boys and Girls Club. North of the Boys and Girls Club, ENVIRON observed one electrical transformer manufactured in 1994. The transformer is situated on a concrete pad on soil/grass. The transformer appeared to be in good condition with no obvious visual evidence of releases (e.g. staining) on adjacent concrete (Photos 65 and 66).

During the site walk, ENVIRON visited Cornucopia located in the northern portion of MHS (Photo 57). The owner of Cornucopia provides an educational program for the elementary and middle/high schools consisting of lessons in organic farming and landscaping. ENVIRON observed wooden benches made of tree stumps, upon which students sit during lectures (Photo 58). The remaining area was landscaped with flowers and farmed rows of vegetables in elevated planters. Cornucopia is bounded to the west by the ESHA (Photo 59).

In the northern parking lot, located south of Cornucopia, ENVIRON observed a retention basin, constructed in approximately 2008 by the California Conservation Corps. Storm water and runoff from the parking lot drain in the infiltration basin. During the site visit, ENVIRON observed water in the basin (Photo 51).

In the Bus Barn and grounds area located on the northwest portion of MHS, ENVIRON observed asphalt patches associated with two former diesel 10,000-gallon Underground Storage Tanks (USTs) (Photo 63), which were removed in August 1992 (see Section 4.4.1.1 for details). According to facility personnel, the Bus Barn is used to store cleaning supplies for bus cleaning. The grounds shop is used to store gasoline, small quantities of herbicides, such as RoundUp, and other grounds use equipment. This building was locked during all of ENVIRON's site visits and therefore ENVIRON was unable to view the interior of the building.

ENVIRON observed the septic systems and leach pits that service MHS. The septic tanks, which are listed in Table 1 and illustrated on Figure 4, are located in the southernmost parking lot (Septic Tank 1), west of the Administration Building (Septic Tank 3), south of Building H (Septic Tank 4), north of Building D (Septic Tank 5), at the basketball courts (Septic Tank 6), and north of the "Bus Barn" (Septic Tank 11). Seven monitoring wells (MW-5, 6, 7, 8, 9, 10, and 11) were observed on MHS. These monitoring wells were installed between March 28 and April 6, 2009 as part of an evaluation of and upgrade to the existing septic system under the WDR permit. The wells are monitored in compliance with the WDRs on a quarterly basis under oversight of the LARWQCB (GeoConcepts 2009).

4.2.2 Interviews

ENVIRON interviewed Mr. Terry Kamibayashi, Manager of Maintenance and Construction, and Mr. Terance Venable, Manager of Operations and Grounds. According to these facility personnel, no chemical spills are known to have occurred at JCES. The District reported one environmental release at MHS related to two former 10,000-gallon diesel USTs in the Bus Barn area. Subsurface investigations related to the former USTs and their subsequent removal are documented in detail in Section 4.4.1.1.

According to Mr. Terance Venable, the Los Angeles County Health Department mandates management of ground squirrels and gophers. Rodenticides are not currently used at the site and use of such chemicals ceased in November/December 2013. Previous to this time, squirrels were controlled through use of bait boxes containing Diphacinone, which were placed on the ground on hillsides and slopes. Gophers were controlled by localized placement of Diphacinone or strychnine pellets in gopher burrows. Rodent abatement services were conducted bi-weekly by Stanley Pest Control. Rodenticides may have been applied via broadcasting prior to 2010; this method of application ceased in 2010. Broadcasting was confined to areas away from existing buildings, and primarily conducted on the hillsides immediately east of MHS.

The Los Angeles County Health Department, which routinely assesses rodent populations as part of its jurisdiction, will issue a letter if it deems abatement and rodent control is needed.

Ant control is conducted on as needed basis. Typically, surfaces are cleaned first by removing residual food and crumbs before deploying physical ant traps. Spiders are abated by sweeping the affected area.

Weeds were controlled using the herbicide “RoundUp” for spot application on slopes, away from buildings. Reportedly, the use of herbicides ceased in November/December 2013. Currently, weed whackers are used for weed abatement and control.

Fertilizers are applied three to four times per year only on athletic fields.

4.2.3 Current Chemical Use

According to facility personnel and based on site visit observations, current chemical use at the site is limited to maintenance (e.g., janitorial) chemicals, which are stored in gallon containers and kept in locked custodial closets (one closet per floor in each building) and pool chemicals, which are stored in the pool chemical storage area, east of the swimming pool. MSDSs related to general cleaning materials are included in Appendix D. MHS stores only small quantities of chemicals for educational purposes, some of which may be hazardous, in the chemistry storage room, woodshop, and photography dark room. Small quantities of herbicides (e.g., RoundUp) may be stored in the grounds shop located in the northwest corner of MHS.

4.3 Site History

ENVIRON reviewed a variety of historical sources to understand the historical uses of the site.

In recognition of the community’s concerns regarding potential historical use of the site for unspecified military purposes, in addition to reviewing historical aerial photographs, ENVIRON also obtained a search of formerly used defense sites (FUDs) through DTSC, contacted the World War II Museum in Oxnard (Mr. Ron Fleishman), and visited the Malibu Library to research historical documentation of the military use in the area. According to a book by Ronald Rindge entitled "*WWII Homeland Defense: US Coast Guard Beach Patrol, in Malibu 1942 – 1944,*" during World War II several military stations were established along the Malibu coast. Based on information contained in this book the closest United States Guard Service Station (Station N-7) to the site is located near Point Dume, approximately 3 miles southeast of the site. Shortly after Station N-7 was established in August 1942, World War II (WWII) broke out and the army occupied Point Dume because of its strategic location. A target was mounted on rails that extended east – west from Grasswood Avenue running easterly downslope north of Cliffside Drive, with the east end located east of Fernhill Drive (approximately 3 miles southeast from the site). According to the author, "*Machine guns and cannons would fire at the target moving slowly from west to east, with the projectile falling harmlessly into the ocean*." Based on the description provided, the target on rails was not located within the site boundaries. In addition, ENVIRON's review of aerial photographs and the FUDs search did not indicate any historical military uses of the site.

A description of the use history and development of the site is presented below.

4.3.1 Topographic Maps

ENVIRON reviewed the following USGS topographic maps, included as Appendix E:

- 1903 Camulos, California, 30-Minute Series;
- 1910 Southern California Sheet 3, 60-Minute Series;
- 1921 Triunfo Pass, California 15-Minute Series;
- 1932 Point Dume, California 6-Minute Series;
- 1947 Triunfo Pass, California 15-Minute Series; and
- 1951, 1967, 1981, 1994, and 1995 Point Dume, California 7.5-Minute Series.

The 1903, 1910, 1921, 1932, and 1947 topographic maps depict the site as undeveloped land. PCH is first depicted as a paved road on the 1947 topographic map. The 1951 map depicts the site as undeveloped land north of Morning View Drive, which appears to be paved. The 1967, 1981, 1994, and 1995 maps depict several buildings on JCES and MHS.

4.3.2 Aerial Photograph Review

ENVIRON reviewed aerial photographs of the site and vicinity obtained from sources listed in Section 3.1 for the years: 1928, 1935, 1938, 1944, 1947, 1952, 1959, 1964, 1965, 1966, 1967, 1976, 1990, 1994, 2001, 2002, 2005, 2009, 2010, and 2012. Aerial photographs are included in Appendix F and are described below:

1928

The 1928 aerial photograph depicts the site as undeveloped land covered with natural vegetation. PCH appears unpaved.

1935, 1938, and 1944

The 1935, 1938, and 1944 aerial photographs depict the site as undeveloped land covered with natural vegetation. PCH is a well-defined paved highway.

1947

The 1947 aerial photograph depicts the site as undeveloped land covered with natural vegetation. The site appears to have been used for activities related to dry land farming. Streets such as Morning View Drive, Merritt Place, and PCH are well defined on the 1947 aerial photograph.

1952

The 1952 aerial photograph depicts the site and surrounding area as mostly undeveloped. The central portion of what is now MHS appears to have been used for dry farming. Scattered residences are visible northwest of the site.

1959

The 1959 aerial photograph depicts buildings that are in the same configurations as school buildings A (administration), B (classrooms 1 through 5), C (classrooms 8 through 11), and D (classrooms 12 through 15) at JCES. MHS remains undeveloped, with what appears to be a graded area directly east of the JCES campus.

1964

The 1964 aerial photograph depicts JCES similarly to the 1959 aerial photograph with the addition of the western portion of Building F. MHS is developed with the buildings containing Building H (the Auditorium and Kitchen), Building E (Middle School/Blue Building), Building F (Music), Building I (Graphic Arts), and the Bus Barn. Residences are visible northwest and south of the site.

1966, 1967

The 1966 and 1967 aerial photographs depict JCES similarly to the 1964 aerial photograph with the addition of Building E (library) and eastern section of Building F (classrooms 16 through 23). MHS appears to be unchanged from the 1964 aerial photograph.

1976, 1982, 1990

The 1976, 1982, and 1990 aerial photographs depict JCES unchanged from the 1966/67 aerial photographs. MHS includes Buildings: A (Library), B/C (Administration), D (Science), G (Art, Woodshop), and the Old Gymnasium. The swimming pool and the athletic fields (football and baseball) also are visible on the aerial photograph.

1994, 2001

The 1994 and 2001 aerial photographs depict JCES in its current configuration including Building G (Multipurpose room) and the trailers used for after school childcare. MHS remains unchanged from the 1990 photograph. An increase in residential density around the site is evident.

2005, 2009, 2010, and 2012

The 2005, 2009, 2010, and 2012 aerial photographs depict the site in its current configuration. JCES remains unchanged from the 1994 aerial photograph. MHS attained its current configuration in the 2005 aerial photograph, which depicts Building K and the New Gymnasium.

4.3.3 Sanborn Map Review

Sanborn Fire Insurance Maps (Sanborn Maps) originally were generated in the late 1800s to mid-1900s to document possible fire hazards related to the types of building structures and their general use. ENVIRON requested Sanborn maps from EDR. According to EDR, there is no Sanborn Map coverage for the site and vicinity.

4.3.4 Agency File Review

Los Angeles County Fire Department

ENVIRON requested information pertaining to the site from the LACFD. The LACFD referred to PHI as custodian of records.

Los Angeles County Department of Environmental Health, Public Health Investigations

ENVIRON reviewed records pertaining to the site from the PHI. Reviewed files included inspection field notes from the LACFD. The inspection forms dated May 4, 2007 and July 27, 2012 indicate that MHS is a small quantity generator due to waste generated in the chemistry laboratory located in Building D and chemicals used at the swimming pool.

Department of Toxic Substances Control Cypress and Chatsworth Offices

ENVIRON requested information pertaining to the site from the DTSC. According to the DTSC's EnviroStor website, a Phase I ESA (Phase I) was performed in March 2000 for MHS by CTL Environmental Services (CTL). The purpose of the Phase I was to identify potential environmental concerns associated with current and previous uses of the site and adjacent properties. CTL concluded that there were no potential environmental concerns associated with current and previous uses at MHS. In a letter dated May 9, 2000, the DTSC indicated that "*Based on DTSC's review of the information presented and discussed in the Phase I and a site visit conducted May 1, 2000, no actual or potential hazardous substance release was indicated which would pose a threat to human health or the environment under any land use. Therefore DTSC determines that no action is necessary with respect to investigation and remediation at the site*."

Los Angeles County Department of Public Works

ENVIRON reviewed records at the LACDPW regarding the two former 10,000-gallon diesel USTs located in the Bus Barn area in the northwest portion of MHS.

In a letter dated May 15, 1986, Dames and Moore reported the results of integrity testing conducted on the former diesel USTs, which indicated a "slight leak somewhere within the system and arrangements are being made to have the systems checked and repaired." On August 27, 1987, the LACDPW issued a letter regarding the USTs integrity test failure and requested a written report to document the lateral and vertical extent of the potential impact of the leaking USTs. The USTs were removed in August 1992 under the oversight of the LACDPW. In early 1993, the UST case was transferred to the LARWQCB. Refer to the LARWQCB header below for further information.

Regional Water Quality Control Board– Los Angeles Region

ENVIRON reviewed files obtained from the LARWQCB related to two former 10,000-gallon diesel USTs located in the Bus Barn area in the northwest portion of MHS. The former USTs were removed under the oversight of the LACDPW in August 1992.

Soil sampling conducted beneath the USTs indicated that the soil was impacted with diesel, toluene, ethylbenzene, and xylenes at maximum concentrations of 5,800 micrograms per kilogram (µg/kg) 10,000 µg/kg, 15,000 µg/kg, and 130,000 µg/kg, respectively. Stockpiled soil was taken offsite for disposal at a permitted facility. Two additional subsurface investigations conducted in October 1992 and January 1993 indicated that diesel, benzene, toluene, ethylbenzene, and xylenes (collectively known as BTEX) were detected at depths ranging from 14 to 40 feet bgs. Additionally, a grab groundwater sample collected from perched groundwater encountered at a depth of approximately 40 feet bgs indicated the presence of BTEX at concentrations of 1,500 micrograms per liter (µg/l), 19,000 µg/l, 2,300 µg/l, and 15,000 µg/l, respectively.

At the request of LARWQCB, four monitoring wells were advanced in the vicinity of the former USTs; two upgradient (MW-1 and MW-2) and two downgradient (MW-3 and MW-4; see Figure 8). Three rounds of groundwater monitoring confirmed that total petroleum hydrocarbons (TPH) and BTEX were not detected in the up-gradient wells MW-1 and MW-2. TPH was not detected in the down-gradient wells MW-3 and MW-4. Toluene, ethylbenzene, and xylenes also were not detected above their respective maximum contaminant levels (MCLs) in these wells. During the last groundwater monitoring event conducted in July 18, 1996, benzene and ethylbenzene were detected at concentration of 33.4 µg/l, (exceeding its MCL of 1 µg/l) and 34.7 µg/l (below its MCL of 700 µg/l), respectively. Based on the groundwater monitoring results, Ocean Blue Engineers concluded that concentrations of BTEX had generally been declining, and therefore requested closure from the LARWQCB on August 21, 1996. On September 11, 1996 the LARWCQB granted closure for the former USTs. Monitoring wells MW-1 through MW-4 were abandoned on November 6, 1996.

Los Angeles County Sanitation District

ENVIRON requested information pertaining to the site from the LACSD. According to the LACSD there were no records pertaining to the site, as the site is not connected to the LACSD sewer system.

City of Malibu Environmental Programs

ENVIRON requested information pertaining to the site from the City. According to the City, there were no records pertaining to the site.

City of Malibu Building Department

ENVIRON requested information pertaining to the site from the City Building. According to the City Building, no records were found pertaining to the site. The City Building Department indicated that permits would be issued by the State.

State of California – Division of State Architects

ENVIRON requested information pertaining to the site from the State regarding building permits. According to the State, no building permits were found pertaining to the site.

South Coast Air Quality Management District

ENVIRON reviewed files obtained from the SCAQMD. The files contained two permits for MHS: 1) a permit dated March 19, 1996, to construct/operate an emergency electrical generator for the MHS and 2) a permit dated August 7, 2013, for a boiler/water heater for the swimming pool.

4.4 Previous Investigations

To date, subsurface investigations have been conducted only at MHS. Subsurface investigations have not been conducted at the JCES. Subsurface investigation information was obtained from available files received from regulatory agencies and files received from the District. Interior investigations of the building materials are outside the scope of this PEA Work Plan and thus are not discussed in this PEA Work Plan.

4.4.1 Subsurface investigations

Previous subsurface investigations conducted at MHS consisted of:

- Removal of the two former 10,000 gallon USTs located at the Bus Barn; these investigations were conducted by Ocean Blue Engineers, Cape Environmental Management, and Vector Three Environmental between 1992 and 1996;
- Evaluation and backfilling of septic system leach pits at JCES and MHS conducted by Topanga Underground in 2009; and
- Soil investigations and subsequent soil removal in areas proposed for redevelopment at MHS; these investigations were conducted by Arcadis in 2009 and 2010. Soil removal was conducted in 2011.

These investigations are summarized in the following sections.

4.4.1.1 Former UST Removal Activities

In a letter dated May 15, 1986, Dames and Moore reported the results of integrity testing conducted on the former diesel USTs, which indicated a “slight leak somewhere within the system and arrangements are being made to have the systems checked and repaired.” On August 27, 1987, the LACDPW issued a letter regarding the USTs’ integrity test failure and requested a written report to document the lateral and vertical extent of the potential impact of the leaking USTs. The USTs and associated piping were removed in August 1992 under the oversight of the LACDPW. Soil confirmation samples were collected two feet beneath the former USTs and associated dispensers and were analyzed for BTEX by USEPA Method 8020 and for total petroleum hydrocarbon-diesel (TPH-d) by USEPA Method 8015 Modified (M). Analytical results indicated that toluene, ethylbenzene, xylenes, and/or TPH-d were detected in soil in sample SST2AW at maximum concentrations of 10,000 µg/kg, 15,000 µg/kg, 130,000 µg/kg, and 5,800 µg/kg, respectively.

Five stockpile soil samples were collected from stockpiled excavated soils and were analyzed for BTEX by USEPA Method 8020 and for TPH-d by USEPA Method 8015 Modified (M). Stockpile soil sampling results indicated that diesel was detected at maximum concentration of 1,200 milligrams per kilogram (mg/kg). Toluene was detected in a sample at a concentration of 6.2 µg/kg and xylenes were detected in two soil samples at concentrations of 880 µg/kg in SSSP1E and 430 µg/kg in SSSP1SE.

The removed USTs were certified as non-hazardous and were transported to D.W. Russel Co. for recycling or destruction.

In October 1992, eight borings (B1 through B8) were drilled in the vicinity of the former USTs to characterize the extent of impacted soil. Soil borings B3 and B8 were advanced to a depth of approximately 40 feet and 35 feet bgs, respectively. Soil Borings B1, B2, and B4 through B7 were advanced to a depth of approximately 20 feet bgs, and soil samples were collected at variable depths as summarized on Figure 7. Soil samples were analyzed for BTEX by USEPA Method 8020 and for TPH-d by USEPA Method 8015M. Soil sampling results indicated that BTEX and TPH-d were detected at maximum concentrations of 360 µg/kg, 17,000 µg/kg, 32,000 µg/kg, 310,000 µg/kg, and 2,200 µg/kg, respectively (see Figure 7).

In January 1993, an additional subsurface investigation was conducted to better define the extent of impacted soil. Three additional soil borings (B9 through B11) were advanced to depths of approximately 30- and 40-feet bgs. Soil samples were collected from boring B9 starting from approximately 25 feet bgs and then at 5 foot intervals to the total depth of the boring and from boring B11 starting from approximately 15 feet bgs and then at 5 foot intervals to the total depth of the boring. Boring B10 was slant-drilled underneath the dispensers and the building and sampled at depths of approximately 12-, 21-, and 30-feet bgs and two soil samples (W. dispenser #1 and E. dispenser #2) were collected directly underneath the dispensers at depths of approximately 3- and 4-feet bgs, respectively. Soil samples were analyzed for BTEX by USEPA Method 8020 and TPH-d by USEPA Method 8015 M. BTEX and TPH-d were detected in soil samples from B9 through B11 at maximum concentrations of 500 µg/kg, 690 µg/kg, 320 µg/kg, 2,900 µg/kg, and 14 µg/kg, respectively.

Soil samples collected below the dispensers indicated that soil was impacted with TPH-d at a maximum concentration of 290 µg/kg. BTEX were not detected above their respective laboratory reporting limits (see Figure 7).

During advancement of the borings, perched groundwater was encountered in boring B11 at approximately 40 feet bgs and a grab groundwater sample was collected and analyzed for BTEX by USEPA Method 8020. The grab groundwater sample results indicated that BTEX was detected at concentrations of 1,500 micrograms per liter (µg/l), 19,000 µg/l, 2,300 µg/l, and 15,000 µg/l, respectively (see Figure 8).

In early 1993, oversight of the USTs removal was transferred from the LACDPW to the LARWQCB. The LARWQCB requested evaluation of groundwater conditions through installation of four monitoring wells. In 1995, monitoring wells MW1 through MW3 were installed to a depth of approximately 50 feet bgs and monitoring well MW4 was installed to a depth of approximately 42 feet bgs (see Figures 7 and 8). During well installation, soil samples were collected at 5-foot intervals from each boring. BTEX and TPH-d were not detected above their respective laboratory reporting limits in soil samples obtained from borings MW-1 through MW-3. Soil samples obtained from monitoring well MW-4 exhibited BTEX at maximum concentrations of 444 μg/kg, 63 μg/kg, 212 μg/kg, and 193 μg/kg at approximate depths ranging from 32 to 35 feet bgs (see Figure 7).

Based on ENVIRON's review of the available soil analytical data concentrations of ethylbenzene in certain soil samples exceeded its current applicable USEPA residential regional screening levels (RSL).

Initial groundwater sampling results, post well development, indicated that BTEX and TPH-d were detected only in MW-3 and MW-4 at maximum concentrations of 42.9 μg/l 16.3 μg/l, 6.9 μg/l, 41.5 μg/l, 1.2 μg/l, respectively. BTEX and TPH-d were not detected above their respective laboratory reporting limits in MW-1 and MW-2 (Figure 8).

In 1996, three quarters of groundwater sampling were conducted in January, April, and July. Concentrations of BTEX and TPH-d were not detected above their respective laboratory reporting limits in MW-1 and MW-2. Concentrations of BTEX in monitoring well MW-4 decreased to below their respective reporting limits by July 1996. In monitoring well MW-3, the July 1996 sampling results indicated that TPH-d, toluene, and xylenes were not detected above their laboratory reporting limit. Benzene was detected at a concentration of 33.4 μg/l, exceeding its MCL of 1 μg/l and ethylbenzene was detected at a concentration of 34.7 μg/l, below its MCL of 700 μg/l (Figure 8).

Based on the groundwater monitoring results, Ocean Blue Engineers concluded that concentrations of BTEX had generally been declining, and therefore requested closure from the LARWQCB on August 21, 1996. On September 11, 1996 the LARWQCB provided closure for the former USTs. Monitoring wells MW-1 through MW-4 were abandoned on November 6, 1996.

4.4.1.2 Evaluation and Backfilling of Septic Systems Leach Pits

In 2009, a District contractor, Topanga Underground, installed 11 monitoring wells (MW-1 through MW-11) at JCES and MHS to evaluate the separation between the groundwater table and the base of each leach pit associated with the various on-site septic systems. The City of Malibu requires a separation of 10 feet between the bottom of each leach pit and the groundwater table. The locations of the monitoring wells and septic tanks are illustrated on Figure 2. Depth to water measurements collected following installation of the monitoring wells indicated that the distance between the groundwater table and the bottom of each pit associated with Septic Systems 1, 3, 4, 7, 9, and 11 was less than 10 feet and therefore the base of the leach pits needed to be adjusted. For each pit requiring adjustment, a concrete and sand slurry mixture was placed in the lower portion of the pit, raising the bottom of the pit to obtain the required 10-foot separation between the bottom of the pit and the underlying groundwater table. Details are presented on Table 1. In accordance with the LARWQCB WDR permit for the septic systems, groundwater monitoring wells are gauged and sampled quarterly to monitor the separation between base of the leach pits and the water table and to monitor for coliform bacteria (total and fecal), enterococcus, Ammonia, and pH.

4.4.1.3 Shallow Soil Sampling by Arcadis

In October 2009, LFR/Arcadis, on behalf of the District, conducted a Phase I ESA in preparation for the redevelopment of certain portions of MHS. The Phase I ESA identified five RECs: REC-1, the potential for lead-based paint (LBP) and termiticides due to the age of the buildings; REC-2, the former 10,000 gallon former diesel USTs; REC-3, septic tanks; REC-4, bus washing station in the bus barn; and REC-5, transformers.

Arcadis reviewed these RECs in light of the planned redevelopment, which at that time, consisted of the 20 areas illustrated on Figure 9. Arcadis then prepared a PEA Work Plan to evaluate the 3 RECs that were located within the boundaries of the 20 areas proposed for redevelopment and improvements. The other two RECs were not included in the PEA because they were located outside the proposed improvement areas. The 3 RECs addressed in Arcadis' PEA are illustrated on Figure 9 and include:

- **REC-1:** Current and former structures constructed prior to the ban of LBP and organochlorinated pesticides in the late 1970s/early 1980s identified as development Areas 9 through 12 (Figure 9);
- **REC-2:** Residual volatile hydrocarbons in the vicinity of the former USTs located adjacent to Area 14 and hydrologically up-gradient from development Areas 3 and 13 (Figure 9); and
- **REC-3:** The potential for hazardous materials from the chemistry laboratories, woodshop, art studio, and/or the photography darkroom being released to the septic systems in development Area 15 and adjacent to Area 9 (Figure 9).

Arcadis conducted the PEA in November 2009 and February 2010. The PEA included the collection and analysis of soil and soil vapor samples. Results were compared to residential California Human Health Screening Levels (RCHHSLs)[4]. Results of Arcadis' investigation of the RECs are summarized below:

REC-1: Shallow[5] soil samples were collected from depths of approximately 0.5- and 2.5-feet bgs at 18 locations (SS-Structure-1 through SS-Structure-18) and were analyzed for lead (Figure 10A), pesticides (Figure 10B), and PCBs (Figure 10C) using USEPA Methods 6010B, 8081A, and 8082, respectively. Below is a summary of the compounds detected:

- Lead concentrations ranged from 2.74 mg/kg in SS-STRUCTURE-10-0.5 to 57.4 mg/kg in soil sample SS-STRUCTURE-7-0.5 located east of Building E (Figure 10A). Lead concentrations were not reported above the RCHHSL for lead of 80 mg/kg.
- Of the pesticides, technical chlordane, alpha chlordane and gamma chlordane were detected in soil at maximum concentrations of 1,910 µg/kg, 683 µg/kg and 305 µg/kg in soil sample SS-STRUCTURE-7-0.5, located east of Building E (Figure 10B). 4,4-DDT was detected at a maximum concentration of 361 µg/kg at SS-Structure-13-0.5, located north of

[4] In 2010 when Arcadis compared detected concentrations of PCBs, pesticides, and metals to screening thresholds, it used residential CHHSLs. According to the current DTSC PEA Guidance Manual (page 39), "CHHSLs are no longer generally recommended for use in a human health risk evaluation, because they are not routinely reviewed and revised as new scientific information becomes available."

[5] Shallow samples are less than or equal to 2.5 feet.

Building A. Technical chlordane exceeded the RCHHSL of 430 µg/kg at SS-STRUCTURE-7 at 0.5 feet (1,910 µg/kg) and 2.5 feet (601 µg/kg), and alpha chlordane exceeded the same RCHHSL at 0.5 feet (683 µg/kg).

- Aroclor-1254 was the only detected PCB, with a maximum concentration of 1,040 µg/kg in soil sample SS-STRUCTURE-12-0.5, located north of Buildings B/C (Administration Building) (Figure 10C). PCBs (Aroclor-1254) exceeded the RCHHSL of 89 µg/kg at 11 of 18, or 61 % of sampled locations.

Subsequent to the initial sampling, 16 step-out soil samples (SS-SO-2 through SS-SO-17) were collected from depths of approximately 0.5- and/or 2.5-feet bgs from various areas to further delineate PCB-impacted soils and 3 soil step-out samples (SS-SO-18 through SS-SO-20) were collected to delineate pesticide-impacted soils surrounding sample location SS-Structure-7. In summary:

- Aroclor-1254 was reported in soil samples collected from approximately 0.5 feet bgs at locations SS-SO-2 through SS-SO-6, SS-SO-9, SS-SO-13, and SS-SO-14 and ranged in concentrations from 50.4 µg/kg to 1,420 µg/kg, exceeding the RCHHSL of 89 µg/kg at five locations. Aroclor 1254 also was detected in soil samples collected from approximately 2.5 feet bgs at locations SS-SO-2 (98.8 µg/kg) and SS-SO-5 (119 µg/kg) that exceeded the RCHHSL of 89 µg/kg. All other reported detections of Aroclor 1254 in soil samples collected from approximately 2.5 feet bgs were below the RCHHSL (see Figure 11A).
- Pesticide soil step-out samples were collected from a depth of approximately 0.5-feet bgs. Pesticides were not detected above laboratory reporting limits in soil samples SS-SO-18 or SS-SO-19. Alpha chlordane, gamma chlordane and technical chlordane were detected in soil sample SS-SO-20 at concentrations of 21.2 µg/kg, 15.3 µg/kg, and 155 µg/kg, respectively, below their RCHHSLs of 430 µg/kg, 500 µg/kg, and 430 µg/kg (see Figure 11B).

REC- 2: Three vapor probes (SV-5 through SV-7) were advanced in the vicinity of the neutralization tank, and three vapor probes (SV-8 through SV-10) were advanced north of the Bus Barn area. Soil vapor samples were collected at 5 and 10 feet bgs. Soil vapor samples were analyzed for volatile organic compounds (VOCs) by USEPA Method 8260B. Soil vapor sampling results indicated that VOCs were not detected above their respective laboratory reporting limits in SV-5 through SV-7, in the general vicinity of the neutralization tank.

Benzene was detected at 5 and 10 feet bgs at a concentration of 0.1 µg/l and 0.16 µg/l in SV-9. Toluene was not detected at 5 feet bgs in any of the 3 vapor probes, but was detected in all 3 soil vapor samples at 10 feet bgs at a maximum concentration of 1.2 µg/l in soil vapor probe SV-8. Soil vapor sampling results are depicted on Figure 12. No step-out sampling was conducted.

REC-3: Soil and soil vapor sampling were conducted in REC-3 as further described below:

Shallow Soil Sampling

Soil samples were collected from nine locations (SS-Perc-1 through SS-Perc-9) at depths ranging from 10- to 30-feet bgs to evaluate the seepage pits associated with the septic systems. Four background soil samples (SB-1 through SB-4) were also were collected from approximately 2.5 feet bgs from undeveloped areas around the site. All samples were analyzed for metals and pH by USEPA Methods 6010 and 9045C, respectively. Maximum concentrations of detected metals were compared to the maximum concentrations of metals in background samples and to the RCHHSLs. Results are illustrated on Figure 13A. pH ranged from 7.0 to 8.7 pH units in the percolation zone samples and ranged from 7.6 to 7.7 pH units in the background sample locations (see Figure 13A). Metals that were detected at concentrations greater than their respective CHHSLs are discussed below:

- Arsenic concentrations ranged from 1.12 mg/kg to 13.7 mg/kg in the soil samples collected from the percolation zones and from 3.59 mg/kg to 10.6 mg/kg in the soil samples collected from undeveloped areas for the background metals comparison. Detected arsenic concentrations collected from the percolation zones and the background samples exceeded arsenic’s RCHHSL of 0.07 mg/kg.
- Cadmium concentrations ranged from not detected above the laboratory reporting limit to 6.17 mg/kg in the percolation zone samples and ranged from 1.05 mg/kg to 4.77 mg/kg in the background sample locations. Select cadmium concentrations collected from the percolation zones and the background samples exceeded cadmium’s RCHHSLs of 1.7 mg/kg.
- Lead concentrations ranged from 0.59 mg/kg to 304 mg/kg in the percolation zone sample locations and ranged from 1.23 mg/kg to 4.1 mg/kg in the background sample locations. Detected lead concentrations collected from the percolation zones and the background samples were below the RCHHSLs of 80 mg/kg, except for one location, SS-Perc-9 (near the neutralization tank), are at a depth of approximately 10 feet bgs at a concentration of 304 mg/kg.

While the concentrations of certain metals were above their respective CHHSLs, these same metals occur naturally in soils throughout California, At this site, arsenic and cadmium concentrations were found to be consistent with background concentrations.

Lead was detected in sample SS-Perc-9 (near the neutralization tank are) at a depth of approximately 10 feet bgs at a concentration of 304 mg/kg, exceeding the maximum background for lead of 4.1 mg/kg and the RCHHSL of 80 mg/kg. Step-out (and up) sampling was conducted and consisted of one soil boring (SS-SO-1), with soil samples collected from depths of approximately 0.5- and 2.5-feet bgs, adjacent to SS-Perc-9. These soil samples were analyzed for lead by USEPA Method 6010B. Lead was detected at 5.03 mg/kg at 0.5-foot bgs and 2.26 mg/kg at 2.5 feet bgs, below the RCHHSL of 80 mg/kg (see Figure 13B).

Soil Vapor Sampling

Four soil vapor probes were advanced in the vicinity of the leach pits associated with Septic Tank 1 (SV-1 through SV-4). Soil vapor samples were collected at depths of approximately 5 and 10 feet bgs. Soil vapor samples were analyzed for VOCs. Analytical results illustrated on Figure 14 indicate that toluene was detected in SV-2 in the 10-foot sample at a concentration of 4.3 μg/L and benzene was detected at a concentration of 0.1 μg/L at 5 feet in SV-1, exceeding its RCHHSL of 0.036 μg/L. VOCs were not detected in any of the samples collected from SV-3 and SV-4 (Figure 14).

Human Health Screening Risk Evaluation

Arcadis conducted a Human Health Screening Risk Evaluation (HHSRE) using soil and soil vapor concentrations obtained from the PEA. The HHSRE followed conservative risk estimation procedures recommended by USEPA and the California Environmental Protection Agency. The estimated cancer risk for carcinogenic compounds using the maximum concentrations collected during the PEA was 2×10^{-5}.

A hypothetical risk estimation was calculated by removing impacted soil containing the risk driving chemicals (Aroclor 1254 and technical chlordane) above RCHHSLs, assuming completion of removal and confirmation samples below the remaining maximum concentrations. The hypothetical post-remedial calculation for the carcinogenic cancer risk was estimated at 3×10^{-6}.

In addition, the non-carcinogenic health hazard estimate for the chemicals of potential concern (COPCs) was evaluated. The estimated hazard index (HI) for non-carcinogenic effects was 2, exceeding the standard HI of 1.

A hypothetical risk estimation was calculated by removing PCBs- and pesticide-impacted soil, assuming completion of removal and confirmation samples below the remaining maximum concentrations. The hypothetical post-remedial estimated HI for non-carcinogenic effects was 0.1.

Based on the results of the HHSRE, Arcadis recommended excavating soils containing Aroclor 1254 and technical chlordane at concentrations greater than the applicable RCHHSLs of 430 µg/kg and 89 µg/kg, respectively.

4.4.1.4 Shallow Soil Excavation by Arcadis

Based on the PEA subsurface investigation results and the HHSRE, Arcadis recommended excavating soil at REC-1 that contained pesticides and PCBs (Aroclor 1254 at concentrations greater than the respective PCG. PCGs were established using RCHHSLs as the PCG. Therefore, the PCG for alpha-chlordane, gamma-chlordane, and technical chlordane was based on the RCHHSL of 430 µg/kg for technical chlordane.[6] The RCHHSL of 89 µg/kg was selected as the PCG for PCBs (PCB residential CHHSL is 89 µg/kg for all Aroclors).

[6] Since alpha and gamma chlordane are components of technical chlordane, technical chlordane was considered the indicator chemical.

In August 2010, Arcadis prepared a Removal Action Workplan, which was implemented between July and August of 2011 to excavate, remove, and dispose of impacted soil from nine impacted areas (Areas 1 through 9); Area 9, illustrated on Figure 15A, was identified as pesticide-impacted soil and the remaining eight areas (Areas 1-8) illustrated on Figure 15B were identified as PCB-impacted soil. In total, approximately 1,179 cubic yards (yds^3) of pesticide and PCB-impacted soil was excavated (Figure 15C), subsequently characterized as non- hazardous, and disposed of at the Chiquita Canyon Landfill in Castaic, California. Details of the excavation conducted in each of the areas are discussed below:

Pesticide-Impacted Area (Area 9)

Area 9 was excavated to a total depth of approximately 3 feet bgs. Confirmation samples collected from the bottom and sidewalls of the excavation indicated that pesticides were not detected above their respective laboratory reporting limits (See Figure 15A).

PCB-Impacted Areas (Areas 1 through 8)

PCB-impacted soil identified in Areas 1 through 8 was excavated vertically and laterally until confirmation soil samples were below the respective PCG of 89 µg/kg (See Figures 15B and 15C). Each identified area is further discussed below:

<u>Area 1:</u> Area 1 was excavated to a total depth of 2 feet bgs. Two bottom confirmation samples were collected at a depth of approximately 2 feet bgs; sidewall confirmation samples were not collected. Concentrations of PCBs were not detected above their respective laboratory reporting limits in confirmation samples collected from Area 1.

<u>Area 2:</u> Area 2 was initially excavated to a depth of 2 feet bgs. Three bottom confirmation samples collected at a depth of approximately 2 feet bgs and 1 sidewall sample collected from approximately 1 foot bgs indicated that Aroclor-1254 was detected at concentrations of 85.4 µg/kg and 233 µg/kg in 2 of the bottom confirmation samples and at 89 µg/kg in the sidewall confirmation sample. Based on the initial confirmation sample results, 1 additional foot was excavated laterally and vertically to a total depth of 3 feet bgs. PCBs were not detected in the one sidewall and one bottom confirmation samples.

<u>Area 3:</u> Soil in this area was excavated to approximately 3 feet bgs. One bottom confirmation sample was collected at the base of the excavation. Aroclor-1254 was reported at a concentration of 140 µg/kg in this sample. No sidewall samples were collected. An additional foot of soil was excavated and another bottom confirmation sample was collected. PCBs were not detected above laboratory reporting limits in the bottom confirmation sample.

<u>Area 4</u>: Soil in this area was excavated to approximately 2 feet bgs. One bottom confirmation sample was collected at the base of the excavation and 2 sidewall samples were collected at depths of approximately 1-foot bgs. PCBs were not detected above laboratory reporting limits in any of the confirmation soil samples.

<u>Area 5</u>: Area 5 was divided into four sub-areas (5A through 5D) as further discussed below:

Soil in Area 5A was excavated to approximately 2 feet bgs. Four bottom confirmation samples were collected at the base of the excavation and 4 sidewall confirmation samples were collected at a depth of approximately 1-foot bgs. PCBs were not detected above laboratory reporting limits in the bottom or sidewall confirmation samples.

Soil in Area 5B was excavated to approximately 2 feet bgs. Four bottom confirmation samples were collected at the base of the excavation and 5 sidewall confirmation samples were collected at a depth of approximately 1-foot bgs. PCBs were not detected in the bottom confirmation samples. Aroclor-1254 was detected in 1 sidewall sample at 246 µg/kg. An additional foot was excavated laterally and another confirmation sample was collected. PCBs were not detected in the sidewall confirmation sample. In addition, four soil samples (T-1 through T-4) were advanced in the vicinity of several trees in order to shrink the area of excavation to ensure the safety of the trees during excavation. Soil samples were collected from depths of approximately 0.5- to 4-feet bgs. Aroclor 1254 was detected at concentrations ranging from 74.3 µg/kg in T-4 at 5 feet bgs to 2,350 µg/kg in sample T-4 at 3 feet bgs. An additional soil sample collected from T-4 at 4 feet bgs indicated that Aroclor 1254 was detected at a concentration of 50.8 µg/kg. bgs. PCBs were not detected above laboratory reporting limits in samples collected from T-1 through T-3. Area 5B was excavated laterally to a depth of approximately 5 feet bgs and vertically to 2 feet bgs to remove the detected PCBs at concentrations greater than the PCG.

Soil in Area 5C was excavated to approximately 2 feet bgs. One bottom confirmation sample was collected at the base of the excavation and 1 sidewall confirmation sample was collected at a depth of approximately 1-foot bgs. PCBs were not reported above laboratory reporting limits in the bottom or sidewall confirmation samples.

Soil in Area 5D was excavated to approximately 2 feet bgs. Four bottom confirmation samples were collected at the base of the excavation and 4 sidewall confirmation samples were collected at a depth of approximately 1-foot bgs. PCBs were not reported above laboratory reporting limits in the bottom or sidewall confirmation samples.

Area 6: Area 6 was excavated to approximately 2 feet bgs. Two bottom confirmation samples were collected at the base of the excavation and 1 sidewall sample was collected at a depth of approximately 1-foot bgs. PCBs were not reported above laboratory reporting limits in the bottom or sidewall confirmation samples.

Area 7: Area 7 was excavated to approximately 2 feet bgs. Two bottom confirmation samples were collected at the base of the excavation. Aroclor-1254 was detected in 1 confirmation sample at a concentration of 88.4 µg/kg. No sidewall confirmation samples were collected.

Area 8: Area 8 initially was excavated to approximately 2 feet bgs. Two bottom confirmation samples were collected at the base of the original excavation. Aroclor-1254 was detected in both confirmation samples at concentrations of 199 µg/kg and 409 µg/kg. An additional foot was excavated and 2 confirmation samples were obtained from the base of the excavation at 3 feet bgs. Aroclor-1254 was detected at concentrations of 292 µg/kg and 74.5 µg/kg. An additional foot was excavated below the area where Aroclor-1254 exceeded 89 µg/kg and an additional bottom confirmation sample was collected at 4 feet bgs. PCBs were not detected above their respective reporting limits. Therefore, the maximum depth of the excavation in Area 8 was 4 feet bgs. Sidewall confirmation samples were not collected from Area 8.

PCB-impacted soil identified in Areas 1 through 8 was excavated vertically and laterally until confirmation soil samples were below the respective PCGs of 89 μg/kg. In total, approximately 1,179 cubic yards (yds^3) was estimated to have been removed, characterized as non-hazardous, and disposed of at Chiquita Canyon Landfill in Castaic, California.

4.4.2 Other Evaluations/Investigations

Naturally Occurring Asbestos (NOA)

LFR evaluated the potential presence of NOA at the site during its 2009 Phase I Environmental Site Assessment. LFR concluded that “the closest mapped rock outcrops that are likely to contain naturally occurring asbestos are located approximately 60 to 80 miles northwest of the site in Santa Barbara County.” Therefore, NOA does not appear to be an environmental concern at the site.

Oil Wells

Arcadis and LFR evaluated the potential presence oil wells at the site during its PEA and Phase I Environmental Site Assessment, respectively. Both companies reviewed readily available and pertinent oil and gas field maps from the DOGGR. According to W2-1 Map, the McKeon Oil Co. “Malibou 1” well was located within 0.5 miles of the site. According to the map information, the “Malibou 1” well was a “plugged and abandoned dry hole” and thus did not represent an environmental concern for the site. Therefore, oil wells do not appear to be an environmental concern at the site.

Radon

Panacea conducted a radon survey at JCES and MHS in November 2013. The maximum building-specific average radon concentration measured at JCES was 2.75 picoCuries per liter (pCi/L). The maximum building-specific average radon concentration measured at MHS was 1.18 pCi/L. Based on information included in the EDR database report, the site is located in an area categorized as Zone 2, which has average indoor basement radon levels between 2 and 4 pCi/L. The USEPA’s continuous exposure limit, which is the limit at which further testing or remedial action is suggested, is 4.0 pCi/L. This USEPA continuous exposure limit applies to residential, not commercial, properties. Therefore, radon does not appear to be an environmental concern at the site.

Light Ballasts

In a letter dated October 28, 2005, the District awarded the Phase III Contract for the “Energy Efficient Lighting Retrofit Project” to the Wheatstone Energy Group LLC (Wheatstone). According to payment records, Wheatstone removed light ballasts containing PCBs and replaced them with PCB-free energy efficient lighting at MHS. The invoice that details light ballasts replacement is included in Appendix G. According to facility personnel, in-house staff replaced old ballasts at JCES with PCB-free energy efficient lighting.

4.5 Chemicals of Potential Concern and Areas of Interest

Based on the results of the historical review conducted for the site, ENVIRON's site reconnaissance, results of previous subsurface investigations, and ENVIRON's initial assessment of redevelopment areas, ENVIRON has developed an initial conceptual model for the site, including identification of COPCs and AOIs for further investigation, as described below. This initial conceptual model will be updated as more information becomes available through implementation of the PEA.

- Site geology and hydrogeology are described in Section 3.7. Based on currently available information, perched groundwater is encountered at approximately 51 to 62.7 feet bgs, and flows to the southwest, toward the Pacific Ocean. The area underlying the site is not located within a designated groundwater basin. Groundwater at the site is not used for any purpose.
- The site was undeveloped until approximately the mid- to late-1940s when dry farming appears to have been conducted on portions of the site. Development for school use was first initiated in the late 1950s. ENVIRON did not identify indications of former military use during its historical review of the site. Although pesticides are not typically used during dry farming activities, ENVIRON cannot conclusively rule out the historical use of pesticides at the site. Therefore, pesticides, including certain metals (e.g., arsenic) are considered COPCs at the site in near surface soils (surface to approximately 2 feet bgs), as releases of such chemicals likely would be to the exposed ground surface and shallow underlying soils.
- During the period of school use, diesel USTs were present in the vicinity of the Bus Barn, and septic systems/leach pits and a waste neutralization tank were installed at the site. The investigations conducted at the former USTs indicated that subsurface soils were impacted by petroleum hydrocarbons and related volatile compounds (BTEX) and these soils remain in place. Due to the long use history of the septic systems, ENVIRON cannot conclusively rule out discharges of small quantities of chemicals to the septic systems, including potentially petroleum hydrocarbons, metals, semi-volatile compounds (SVOCs) and volatile chemicals (VOCs). The site also houses several transformers, which recently were replaced with new transformers. The COPC associated with the former transformers is PCBs. The retention basin receives stormwater runoff from parking areas, which could contain SVOCs, metals, and petroleum hydrocarbons. In addition, relatively small quantities of chemicals, including cleaners, petroleum hydrocarbons and metal-containing compounds, may have been used at the site for maintenance purposes. Pesticides, herbicides, and rodenticides also have been applied at the site and the use areas are considered AOIs. Furthermore, due to the construction dates of the various buildings (buildings constructed prior to 1981), termiticides, LBP and PCBs may be present in soil near buildings. Therefore, these areas are considered AOIs.
- Based on the historical and current uses of the site, pesticides, herbicides, metals, petroleum hydrocarbons, SVOCs, VOCs, and PCBs are considered COPCs in certain areas of the site. Pesticides, herbicides, lead, and PCBs are COPCs for near surface soils, as releases of such chemicals would likely be to the exposed ground surface and shallow underlying soils. Petroleum hydrocarbons, SVOCs, VOCs, and metals cannot be ruled out at COPCs for deeper soils (greater than 2 feet bgs) due to the previous USTs, septic systems, and waste neutralization tank. Based on the historical site uses, previous investigation

results, and depth to groundwater, the potential for groundwater impacts is limited to the immediate vicinity of the former USTs at the Bus Barn. CPOCs for groundwater in this area are VOCs and TPH.

- Due to the redevelopment plans at MHS, surface soils in certain areas of the site may be temporarily disturbed during grading. Based on previous site history it is not anticipated that soils in these areas are impacted. However, considering the likelihood of short-term surface disturbance during grading, soils in these areas will be sampled as a precautionary measure and these areas also are classified as AOIs.
- A presentation of the HHSRE component of the conceptual model, which includes exposure pathways for receptors, is presented in Section 8 and graphically on Figure 18.

Based on the historical, current, and anticipated future uses of the site, 18 AOIs have been identified for further evaluation for selected COPCs. These AOIs are described and addressed in Sections 5 and 6 and Table 2 of this PEA Work Plan.

5 PEA Work Plan Rationale

5.1 Conceptual Site Model

The current site conceptual model is presented in Section 4.5. This conceptual model will be updated after implementation of the PEA.

5.1.1 Identification of Chemicals of Potential Concern

Pesticides, herbicides, metals, total petroleum hydrocarbons (TPH), SVOCs, VOCs, and PCBs are considered COPCs in certain areas of the site. COPCs and associated media are listed below:

- Shallow soils (surface to 2 feet bgs): pesticides (organophosphates and organochlorine), herbicides, metals, PCBs, and TPH;
- Deeper soils (> than 2 feet bgs): SVOCs, metals and TPH;
- Soil vapor (equal to or > 5 feet bgs): VOCs; and
- Grab Groundwater: VOCs and TPH.

5.1.2 Identification of Areas of Interest

Eighteen (18) AOIs have been identified at the site based on the following:

- Community concerns;
- Site historical and current use;
- Previous subsurface investigation results;
- Potential exposures;
- The type and nature of COPCs;
- Ongoing discussions with DTSC; and
- The District’s plans for redevelopment of MHS.

The AOIs, rationale for selection, and COPCs are listed in the table below.

AOI No.	Name	COPCs	Rationale for Selection
JCES			
1	Buildings Constructed Prior to 1981	PCBs, pesticides, herbicides, lead	Due to the age of the buildings, buildings may have been painted using lead-based paint. Certain building materials (e.g., caulk) may contain PCBs. Lead and PCBs can be released to the environment during weathering of building materials. Pesticides, herbicides, and termiticides also may have been applied around the exterior of the buildings for vector and weed control, and may have contacted adjacent soils.

AOI No.	Name	COPCs	Rationale for Selection
2	Septic Systems	VOCs, SVOCs, TPH, metals	Septic systems are used primarily to manage discharges of sanitary waste. However, releases of small quantities of chemicals to septic system 8 cannot be ruled out as the system also receive waste from sinks in science rooms and art rooms.
3	Electrical Transformer west of Building A	PCBs	The current electrical transformer, which was installed in 2010, replaced a previous transformer. Due to its age, the previous transformer could have contained PCB-bearing fluids. Although ENVIRON did not observe obvious visual evidence of releases (e.g., staining) at the time of the site visits, without sampling, the potential for a release from the former transformer to soil cannot be ruled out.
4	Grassy and Sandy Playgrounds	Pesticides, herbicides, metals	Pesticides and herbicides may have historically been applied in these areas. Because students regularly access these areas, the potential for occurrence of these compounds will be evaluated.
MHS			
5	Buildings Constructed Prior to 1981	PCBs, pesticides, herbicides, lead	Due to the age of the buildings, buildings may have been painted using lead-based paint. Certain building materials (e.g., caulk) may contain PCBs. Lead and PCBs can be released to the environment during weathering of building materials. Pesticides, herbicides, and termiticides also may have been applied around the exterior of the buildings for vector and weed control, and may have contacted adjacent soils.
6	Areas Previously Excavated by Arcadis	PCBs, pesticides, herbicides	Arcadis previously excavated soils containing PCBs and pesticides. Soil sampling will be conducted in these areas to confirm previous pre- and post-excavation sampling results.
7	Open Areas Around and in Between Older Buildings within AOI-5	Pesticides, herbicides, metals	Pesticides and herbicides may have historically been applied in these areas. Because students regularly access these areas, the potential for occurrence of these compounds will be evaluated.
8	Neutralization Tank	VOCs, SVOCs, metals, TPH, pH	The neutralization tank receives waste from the chemistry laboratory. Based on this use, without sampling, ENVIRON cannot rule out discharges of small quantities of chemicals to the neutralization tank and potentially surrounding soil.

AOI No.	Name	COPCs	Rationale for Selection
9	Former USTs at Bus Barn	VOCs and TPH	Previous investigations of this area indicated the presence of certain VOCs, specifically BTEX, and TPH in soil. The area received regulatory closure from the LARWQCB in 1996. Additional sampling of soil, soil gas, and groundwater will be conducted in this area to evaluate the current status of VOCs and TPH previously detected in the subsurface.
10	Diesel-impacted Soil Stockpile at Bus Barn	TPH	Soil from the previous UST excavation was stockpiled on plastic in this area prior to off-site disposal. Soil sampling will be conducted in this area to assess the potential for residual TPH from the previous soil stockpile.
11	Grounds Shop	TPH, SVOCs, pesticides, herbicides, and metals	Gasoline, pesticides, and herbicides have been stored in the grounds shop. Soil sampling will be conducted in this area to assess the potential of soil impact from current and former operations/storage.
12	Septic Systems	VOCs, SVOCs, TPH, metals	Septic systems are used primarily to manage discharges of sanitary waste. However, releases of small quantities of chemicals to septic systems 1, 3, and 5 cannot be ruled out as the systems also receive waste from sinks in science rooms, art rooms, wood-shop, etc.
13	Retention Basin	SVOCs, TPH, metals	The retention basin receives surface runoff from adjacent parking areas. A soil sample will be collected from the area to evaluate the potential presence of chemical residuals from vehicles parked in the parking area.
14	Athletic Fields	Pesticides, herbicides, metals	Pesticides and herbicides may have historically been applied in these areas. Because students regularly access these areas, the potential for occurrence of these compounds will be evaluated.
15	Cornucopia	Pesticides, herbicides, metals	Pesticides and herbicides may have historically been applied in these areas. Because students regularly access and dig in these areas, the potential for occurrence of these compounds will be evaluated.
16	Undeveloped Area – Building E.	Pesticides, herbicides, metals	Pesticides and herbicides may have historically been applied in this area. Because students regularly traverse this area on the way to the football field, the potential for occurrence of these compounds will be evaluated.

AOI No.	Name	COPCs	Rationale for Selection
17	Electrical Transformers	PCBs	The current electrical transformers, which were installed in 1994 and 2000, replaced previous transformers. Due to the age of the previous transformers, such could have contained PCB-bearing fluids. Although ENVIRON did not observe obvious visual evidence of releases (e.g., staining) at the time of the site visits, without sampling, the potential for a release from the former transformers to soil cannot be ruled out.
18	Redevelopment Areas – Parking Lot, pathway and road; I.T. Room; Tennis Court; new ramp and stairs; new drop-off area; modified stairs in visitor’s parking area; Middle School Quad, and High School Quad.	Pesticides, herbicides, metals	Pesticides and herbicides may have historically been applied in these areas. Due to the redevelopment plans at MHS, surface soils in these areas may be temporarily disturbed during grading. Although, based on previous site history it is not anticipated that soils in these areas are impacted, considering the likelihood of short-term surface disturbance during grading, soils will be sampled as a precautionary measure.

5.2 Sampling Strategy and Rationale

Sampling strategies, techniques, and rationales have been developed for each identified AOI to address the following objectives:

- Evaluate potential impacts to shallow soils adjacent to buildings constructed prior to 1981 from the potential presence of termiticides, PCBs, and LBP in building materials;
- Confirm PCB and pesticide concentrations in soils previously excavated by Arcadis;
- Evaluate potential impacts to shallow soils for pesticides and herbicides due to historical agricultural use and application of pesticides/herbicides/rodenticides during school use;
- Evaluate potential impact to soil, soil vapor, and groundwater due to a release from the former diesel USTs, located at the Bus Barn area;
- Evaluate potential impact to soil from septic tanks and groundwater from septic tanks 1, 3, 5, and 8, and associated leach field/pits;
- Evaluate potential impact to soils from discharges to the neutralization tank;
- Evaluate potential impacts to surface soil at the retention basin due to stormwater discharges from the adjacent parking lot;
- Evaluate the potential for releases of PCB-containing fluids from the former transformers; and
- Evaluate the potential presence of pesticides, herbicides, and metals in areas scheduled for redevelopment where soils may be temporarily disturbed during grading.

5.2.1 Sample Types

To address the objectives listed above, soil, soil vapor, and/or grab groundwater samples will be collected from each of the defined AOIs described in Section 5.1.2. Soil sampling techniques are AOI specific and further described in the next paragraph. Soil vapor sampling will be conducted at multiple depths using (nested) probes to obtain a vertical profile of the chemicals potentially present in the subsurface. Soil samples will be collected from shallow soils (between the ground surface and 2 feet bgs) and deeper soils. Grab groundwater sampling will be conducted in the area of the former USTs at the Bus Barn. In addition, groundwater samples will be collected from monitoring wells MW-3 through MW-7, MW-10, and MW-11 to evaluate groundwater quality upgradient and downgradient from septic systems 1, 3, 5, and 8. Groundwater sampling is further described in Section 6.2.5.

Three types of soil sampling will be conducted at the site: discrete, composite, and incremental. Each soil sampling type will be conducted in accordance with the Soil Sampling Protocol included in Appendix H and is described below:

- **Discrete Sampling**: Discrete sampling is a soil sampling technique whereby soil samples are selected and analyzed individually, providing results at specific locations and depths. Discrete sampling will be used at the majority of the AOIs to evaluate the presence and distribution of COPCs in soil. Results of discrete samples will be used to evaluate potential health risks (Section 8).
- **Composite Sampling**: Composite sampling is a soil sampling technique whereby multiple temporally or spatially discrete soil samples are combined from within an AOI. Composite sampling results will be used to assist the District in deciding if further evaluation is needed for soils in areas subject to redevelopment where soils may be temporarily disturbed during grading activities.
- **Incremental Sampling**: is a structured composite sampling (or advanced composite sampling) and processing protocol that reduces data variability and provides a reasonably unbiased estimate of mean chemical concentrations in a volume of soil targeted for sampling. Incremental sampling provides representative sample by performing the steps outlined in the Soil Sampling Protocol included in Appendix H. Incremental soil sampling will be conducted on the athletic fields where mean COPC concentrations can be used to evaluate potential health risks. The athletic fields will be divided into three Decision Units (DUs) for sampling purposes: (1) the football field (40 increments); (2) the large baseball field (30 increments); and (3) the upper softball/soccer field areas (30 increments).

5.3 Data Quality Objectives

The data quality objective (DQO) process is a seven-step planning approach to develop sampling designs for data collection activities that support decision making. The DQOs for the PEA are based on USEPA's *Guidance for the Data Quality Objectives Process* (USEPA, 2000). The seven-step DQO process is presented below.

1. **State the Problem**

   Identify the planning team members – The members of the planning team are the DTSC project team, including the Project Manager, toxicologist, and geologist; the ENVIRON project team, including the Principal in Charge and Project Manager and District personnel. Input from the community is also considered.

Describe the problem; develop a conceptual model of the environmental hazard to be investigated – ENVIRON's historical review indicates that portions of the site could have been used for dry farming prior to development as a school. Previous focused investigations by Arcadis revealed the presence of lead, pesticides, and PCBs at MHS. Arcadis remediated identified areas of concern in 2011. In addition, previous reports by Ocean Blue Engineering documenting the removal of the former diesel USTs located near the Bus Barn indicated that residual petroleum hydrocarbons and certain VOCs remain in soil and potentially groundwater. Additional AOIs are identified for further evaluation in Section 5.1.2.

Determine resources –personnel, and schedule – Pending review and approval of the PEA Work Plan, fieldwork, laboratory analyses, and data evaluation are currently anticipated to commence in summer 2014. Fieldwork will be conducted by qualified ENVIRON personnel under the oversight of a Professional Engineer (PE) or Professional Geologist (PG), and DTSC personnel.

2. **Identify the Decision**

Identify the principal study question – Are COPCs in soil, soil vapor, and groundwater at concentrations of potential concern to human health and the environment?

Define alternative actions – If COPCs in groundwater, soil and/or soil vapor concentrations are of potential concern, conduct additional evaluations, and assess the need for remediation.

Develop a decision statement – If COPC concentrations are found to be below concentrations of potential concern, no additional action is necessary. If COPC concentrations are found to be at or above concentrations of concern, further evaluations will be conducted. Remedial actions will be conducted, if necessary to address COPC concentrations that pose a significant concern.

3. **Identify Information Inputs**

Identify the information needed – To resolve the decision statement, the planning team will evaluate available information and results of the field investigation and HHSRE carried out under the PEA.

Determine the sources of this information – The field investigation will be carried out as described in Section 6. In addition, information regarding historical site use, including aerial photographs and the previous documents, was reviewed and is summarized in the PEA Work Plan. A site reconnaissance was performed. Previous investigation sampling results and findings were also reviewed (see Section 4).

Determine the basis for determining the Action Level – Consistent with DTSC's PEA Guidance Manual (DTSC, 2013), USEPA RSLs, as modified by the DTSC in *Human Health Risk Assessment (HHRA) Note 3* (HHRA Note 3), will be used for initial comparison purposes. For purposes of performing the HHSRE, it may also be necessary to calculate site-specific screening levels (SSSLs) for potential exposure pathways not included in USEPA's RSLs. As discussed in Section 8, these SSSLs will be developed based on applicable DTSC guidance. Groundwater quality upgradient and downgradient of the four septic systems will be compared and COPC concentrations in the former UST area will be compared to previously detected concentrations in this area. Maximum Contaminant Levels (MCLs) and Notification Levels (NLs) also will be used for initial comparison purposes, however because the groundwater at the site does not have a designated beneficial use under the Basin Plan, MCLs and NLs will not be used for decision-making purposes, other than to rule out COPCs.

Identify sampling and analysis methods that can meet the data requirements – The sampling and analytical methods used to analyze samples are presented in Section 6.

4. **Define the Boundaries of the Study**

   Define the target population of interest – The target population of interest consists of groundwater, soil and soil vapor samples collected as part of the implementation of the PEA Work Plan.

   Specify the spatial boundaries that clarify what the data must represent – The area under investigation is the combined AOIs identified at JCES and MHS.

   Determine the time frame for collecting data and making the decision – Implementation of the PEA Work Plan is currently anticipated to take place in 2014.

   Determine the practical constraints on collecting the data – None expected. Depending on the timing of the work, sampling may need to accommodate the school calendar.

   Determine the smallest subpopulation, area, volume, or time for which separate decisions must be made –18 AOIs have been defined. These AOIs are listed in Section 5.1.2, Table 2, and shown on Figure 16. Taken together, these AOIs encompass the investigation areas for JCES and MHS.

5. **Develop a Decision Rule**

   Specify an appropriate population parameter (mean, median, percentile) – Soil and soil vapor sample results will be compared with screening levels or background concentrations in accordance with DTSC Guidance (DTSC, 2013 [PEA] and DTSC, 2004 [school guidance]). Groundwater sample results will be evaluated as described in No. 3, above.

   Confirm the Action Levels exceed measurement detection limits – Analytical method detection limits will be specified to be less than screening levels (for some analytes [e.g., thallium], it may not be possible to achieve detection limits that are less than specified screening levels using standard analytical methods).

   Develop a decision rule (if…then…statement) – If concentrations of COPCs are less than screening levels or background levels and cumulative cancer risks and non-cancer hazard indices are less than significant thresholds, then no further action is necessary. If concentrations of COPCs exceed screening levels or cumulative cancer risks and non-cancer hazard indices exceed significant thresholds, conduct additional evaluations as necessary to determine the need for remedial action. If necessary, conduct remedial activities to address areas of potential concern and conduct confirmation sampling following remediation to demonstrate that post-remediation COPC concentrations are acceptable.

6. **Specify Tolerable Limits on Decision Errors**

   Laboratory analysis variability will be monitored by collecting QA/QC samples (equipment blanks, trip blanks, etc.) as described in Section 7.

7. **Optimize the Design for Obtaining Data**

   Sections 6 and 7 summarize the procedures that will be implemented as part of the PEA Work Plan to ensure that the data are adequate for achieving the objectives listed above. The procedures described in Sections 6 and 7 include the following components:

   a. Analytical methods and reporting limits, QA/QC procedures and acceptability criteria, and data validation requirements for the study;

   b. Field Sampling Protocols (Appendix H) – describe field sampling methods; and

   c. HASP – describes health and safety requirements and procedures to be used during sampling.

6 Scope of Investigation

The following sections present general procedures to be implemented before and during completion of the fieldwork. Field activities will be conducted under the supervision of a California-registered PG and/or PE and under the oversight of DTSC personnel.

6.1 Pre-field Activities

6.1.1 Field Documentation

ENVIRON personnel working on site will document field activities conducted during the fieldwork associated with this PEA Work Plan. The sampling activities will be documented on appropriate field forms to: (1) provide a record of procedures performed in the field; (2) record key events during field operations; (3) identify samples and track status in the field and during transfer to the laboratory; and (4) facilitate chain-of-custody and accountability procedures by providing legible, concise information. Example field forms are included in Appendix H and specific documentation requirements are included with each field protocol presented in Appendix H.

6.1.2 Health and Safety

A site-specific HASP is included in Appendix I. The work described in this PEA Work Plan will be performed in accordance with the site-specific HASP.

6.1.3 Work Notification

Prior to the start of field work, DTSC will notify school employees and parents of the impending work, as described in Section 2. DTSC also will provide a schedule of field activities so that the school community will be aware of the location of all field work.

6.1.4 Utility Clearance

Prior to initiating fieldwork, ENVIRON will perform a site visit to mark soil and soil vapor boring locations. ENVIRON will request that the District provide utility maps, if such are available. In addition, Underground Service Alert of Southern California or Dig Alert will be notified prior to any drilling activities and will mark utilities at the site boundary. ENVIRON will also retain a subcontractor to clear sampling locations for the presence of underground pipes and utilities using geophysical methods.

6.1.5 Field Equipment Use

Equipment used to obtain measurements during fieldwork implementation will be calibrated in accordance to the equipment manufacturer’s instructions prior to commencing fieldwork and on each day that sampling is conducted. An Equipment Calibration Log is included in Appendix H.

6.2 Field Investigation

Soil, soil vapor, and/or groundwater sampling will be conducted at the site to evaluate environmental conditions in each AOI and meet the overall objectives listed in Section 5.1.1. Proposed soil and soil vapor sampling locations are illustrated on Figure 17. Table 2 lists each identified AOI, number of borings, sampling depths, analytes, proposed scope of work, and rationale for sampling selection and methodology. Groundwater samples will be collected from monitoring wells MW-3 through MW-7, MW-10, and MW-11 and from two borings advanced in the former UST area. Analytical methods are listed in Table 3.

Generally, soil and soil vapor borings at the site will be advanced using a combination of a hand augering, direct push/geoprobe, and/or hollow stem augering drilling techniques depending on the depth of the boring and field conditions encountered during drilling.

6.2.1 Soil

ENVIRON will advance soil borings at the locations depicted on Figure 17. Soil samples will be collected from each boring at variable depths and analyzed by the analytical methods listed in Table 3. Drilling and soil sampling will be performed in accordance with ENVIRON's respective field sampling protocols, included in Appendix H. Soil samples will be delivered for analysis to a California-State certified fixed laboratory on the day of collection, under standard chain-of-custody protocols, in accordance with soil sampling handling protocols included in Appendix H.

6.2.2 Soil Vapor

ENVIRON will advance soil vapor borings at the locations depicted on Figure 17. Each boring will be converted to a temporary multi-depth nested soil vapor probe in accordance with the California Environmental Protection Agency, Department of Toxic Substances Control, Los Angeles Regional Water Quality Control Board, and San Francisco Regional Water Quality Control Board *Advisory – Active Soil Vapor Investigations* (Advisory). Depths of soil vapor probes are summarized in Table 2 and may be adjusted depending on conditions encountered in the field. Soil vapor samples will be collected in accordance with the Advisory, dated April 2012. Soil vapor samples will be analyzed using the analytical methods listed in Table 3 by a California State certified mobile laboratory.

6.2.3 Split Sampling

ENVIRON understands that DTSC will be collecting split samples for independent analysis. ENVIRON understands that other parties may wish to split samples for independent analysis. DTSC participated in developing procedures for split sampling for third parties (meeting attended by representatives of Malibu Unites, the SMMUSD, and Environ on June 16, 2014). The order of sample collection for any splits will be the primary samples to be collected by Environ first, any DTSC split samples to be collected second, any third party split samples to be collected third. Split samples will be analyzed for the same COPCs using the same analytical methods used for the original samples.

6.2.4 Background Soil Sampling

Background soil samples will be collected and analyzed to help distinguish between site-related chemicals and naturally occurring or pre-existing anthropogenic chemical levels. The approach to developing background metals concentrations is in accordance with DTSC's *"Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments of Hazardous Waste Sites and Permitted Facilities"* (DTSC 1997), and *"Arsenic Strategies: Determination of Arsenic Remediation – Development of Arsenic Cleanup Goals"* (DTSC 2009). Background locations are proposed in un impacted areas with similar soil characteristics. Ten soil samples were selected in areas located away from buildings in the undeveloped fields where natural terrain and vegetation are prominent. Proposed background metals sampling locations are depicted on Figure 17. Background soil samples will be collected from 0.5 feet bgs, and analyzed for metals by USEPA Method 6010/7000, which is the same analytical method used to analyze samples collected from other areas from the site.

6.2.5 Groundwater Sampling

Eleven monitoring wells are located at the Site. ENVIRON will measure the depth of each well and the depth to groundwater in each well according to the groundwater level monitoring protocol included in Appendix H.

Grab groundwater sampling will be conducted in the vicinity of the former USTs at the Bus Barn, as specified in Table 2 and on Figure 17. Grab groundwater samples will be collected according to the groundwater sampling protocol included in Appendix H. Grab groundwater samples will be analyzed using the analytical methods specified in Table 3.

Groundwater samples will be collected from monitoring wells MW-3 through MW-7, MW-10, and MW-11. Groundwater samples will be collected according to the groundwater sampling protocol included in Appendix H. Groundwater samples will be analyzed using the analytical methods specified in Table 3.

6.2.6 Field Quality Control Samples

During implementation of the PEA Work Plan field quality control samples will be collected. Quality control samples will include field duplicates (for soil, soil vapor, and grab groundwater samples), trip blanks, and an equipment blank (for grab groundwater samples); such samples will be labeled using the appropriate qualifiers as listed below. Soil samples field duplicates will be collected at a frequency of 5 percent (%) as specified in the PEA Guidance Manual (DTSC, 2013), soil vapor sample duplicates will be collected at a frequency of 10%, as specified in the Advisory, and groundwater duplicate samples will be collected at a frequency of 10%.

6.3 Sample Identification

Soil, soil vapor, and groundwater samples collected during implementation of the PEA Work Plan will be labeled in an appropriately consistent manner to allow identification of the sampling location, type of sample, and depth of sample collection. The sample labeling system is described below.

Samples will be labeled using the designated soil boring number (SV for soil vapor, SB for soil sample, and GW for groundwater sample), followed by the depth of the sample. For example, a complete sample designation for the first soil boring to be advanced at AOI-1, with a sample collected at a depth of 0 to 0.5 feet bgs, will be SB-1-0-0.5.

Sample qualifiers will be used as appropriate, and may include:

TB Trip Blank (for grab groundwater)

EB Equipment Blank (for grab groundwater)
FD Field Duplicate (soil, soil vapor, and grab groundwater)

In addition to the sample number, each sample container will be labeled with the company name, project name, project number, and the initials of the sample collector.

6.4 Sample Custody Procedures

Standard chain-of-custody procedures will be implemented for all samples collected during implementation of the PEA Work Plan. Samples will be clearly labeled immediately after collection, and each sample will be assigned a unique identification number. Chain-of-custody forms will be filled out in the field immediately after the sample has been collected and labeled. Chain-of-custody forms will remain with the samples until such are delivered and/or picked up by the laboratory. General chain-of-custody procedures are described in the individual field sampling protocols presented in Appendix H.

6.5 Analytical Testing

Soil vapor samples will be analyzed for VOCs, in accordance with modified USEPA Method 8260B modified. Analytical methods and sample collection requirements for soil vapor samples are presented in Table 3.

Soil and groundwater samples will be selectively analyzed using the following analytical methods:

- VOCs by USEPA Method 8260B (groundwater only);
- SVOCs by USEPA Method 8270C;
- Pesticides by USEPA Methods 8141 and 8081;
- Herbicides by USEPA Method 8151;
- PCBs by USEPA Method 8082A;
- TPH by USEPA Method 8015M; and
- Metals by USEPA Method 6010/7000.

In addition, approximately five percent of the soil samples selected for PCB analysis also will be analyzed for specific PCBs congeners by USEPA Method 1668. Soil samples will be analyzed from both campuses and cover the full range of PCB concentrations detected at the site. PCB congener data will be compared with those measured by USEPA Method 8082 to confirm the presence or absence of PCBs in soil matrix.

Analytical methods and sample collection requirements for soil gas, soil, and groundwater samples are presented in Table 3.

6.6 Equipment Decontamination

Prior to transporting the drill rig and support equipment to the Site, the rig, drill rods, and other downhole equipment will be steam-cleaned, washed with Alconox or a phosphate-free detergent, and pressure-rinsed with clean water. The drill rig and downhole tools will be cleaned in the same manner after use at each successive boring location.

Soil vapor probe construction materials will be supplied and warranted as new materials, free of solvents, oils, or any foreign matter.

Other equipment used for drilling or sampling will be decontaminated prior to use at each boring location and after collection of each sample using the following decontamination procedure:

- Wash with potable water, using a brush if necessary;
- Wash with Alconox, or a phosphate-free detergent, and potable water solution, using a brush if necessary;
- Rinse with potable water;
- Rinse with distilled or deionized water;
- Air dry; and
- Collect and dispose of rinseate as described in Section 6.8.

6.7 Surveying

The locations of all monitoring wells, soil borings, and soil vapor probes will be surveyed by a licensed surveyor and tied in to the local coordinate system. Vertical elevations will reference mean sea level to the nearest 0.01 foot. Horizontal position will be referenced to the State Plane Coordinate System to the nearest 1 foot.

6.8 Investigation Derived Waste

Decontamination rinseate, disposable sampling equipment, Personal Protective Equipment, and monitoring well purgewater will be collected and contained in a Department of Transportation (DOT)-approved 55-gallon drums.

Drilling residuals such as unused portions of soil samples and drill cuttings will be stored in DOT-approved drums. Analytical results reported from the sampling event will be used to characterize the groundwater and soil residuals prior to off-site disposal.

All drums will be labeled, sealed, and stored on-site at the Bus Barn or other designated area, away from occupied buildings and playgrounds, pending appropriate off-site disposal in accordance with state and federal regulations.

7 Data Evaluation

The purpose of the data evaluation is to evaluate which of the chemicals identified through results of analytical testing are likely to be related to the site use and to assess whether the reported concentrations of those chemicals are of acceptable quality for use in the HHSRE.

7.1 Analytical Methods

Analytical methods, including method detection limits and reporting limits, to be used during implementation of the PEA Work plan are listed in Tables 4A through 4C. A California-State certified laboratory will analyze the soil, groundwaterand soil vapor samples. Laboratory SOPs for the listed methods are presented in Appendix J. Samples will be analyzed according to the USEPA Methods listed above. In general, samples will be processed as a batch. Samples will be processed sequentially, and samples to be analyzed by a given method will be generally processed on the same apparatus. Samples will be processed without interruption of samples from other projects. At a minimum, the laboratory will perform matrix spikes on one of each 20 project samples, or one per sample delivery batch, per matrix type, whichever is more frequent, and independent of the number of analytical instruments used. Samples will be analyzed so that each detected analyte will be quantified within its respective linear range of calibration of the analytical instrument; if analytes are detected outside the linear range of calibration, the sample will be re-analyzed with an appropriate dilution and within holding times so that the analyte can be properly quantified. Corrective actions for any failures in the analytical system will be handled by the selected California-State certified laboratory.

7.2 Data QA/QC

7.2.1 Field QC Procedures

QC samples collected in the field may consist of field duplicates, trip blanks, and laboratory QC samples (for matrix spike [MS] and matrix spike duplicates [MSDs]. The field duplicate is an independent sample collected as close as possible to the same time that the primary sample is collected and from the same source. The field duplicate is used to document sample precision. Field duplicates will be labeled and packaged in the same manner as primary samples so that the laboratory cannot distinguish between the primary sample and the duplicate sample. Field duplicates will be collected by alternately filling the primary sample and the duplicate sample containers, at a location of known or suspected contamination. MS/MSD samples will be collected to check for precision and accuracy of the laboratory analytical results. The MS portion of the sample is an aliquot of a sample that is spiked (by the laboratory) with a known concentration of the target analyte(s) and provides a measure of the method accuracy. The MSD portion of the sample is a laboratory split sample of the MS and is used to determine the precision of the analysis. A minimum of one MS/MSD sample will be collected for every 20 samples collected, or a minimum of one per day.

7.2.2 Laboratory QC Procedures

Laboratory QC samples and procedures will include the following:

- MS/MSD samples will be analyzed at a minimum of one per 20 project samples;

- Method blanks will be prepared and analyzed at least once with each analytical batch, with a minimum of one for every 20 samples;
- Laboratory QC samples will be prepared and analyzed at least once with each analytical batch, with a minimum of one for every 20 samples; and
- Blanks, QC samples, and project samples will be spiked with surrogate compounds if specified in the applicable analytical method. Surrogate recoveries are expected to be within the range set by the laboratory in accordance with procedures specified in the method.

7.2.3 Validation and Verification Methods

Initial data reduction, validation, and reporting will be performed by the laboratory as described in the laboratory SOPs included in Appendix J.

Data validated outside the laboratory will be performed by Laboratory Data Consultants at Level III, as described in the USEPA Contract Laboratory Program National Functional Guidelines for both organic and inorganic data review (USEPA 2008, USEPA 2010).

7.2.4 Data Review

The Project Manager, Project Geologist, or appropriate Task Leader assigned by the Project Manager, will review the laboratory data. If comparison of data to previous measurements or known conditions at the site indicates anomalies, the laboratory will be instructed to review the submitted data. The methods used to collect and handle the samples will also be reviewed. If anomalies remain, the laboratory may be asked to re-analyze selected samples; other possible corrective actions are discussed below.

7.2.5 Corrective Actions

Corrective actions may be initiated if the precision or accuracy goals are not achieved. The initial step in corrective action will be to instruct the analytical laboratory to examine its procedures to assess whether analytical or computational errors caused the anomalous results. At the same time, sample collection and handling procedures will be reviewed to assess whether they could have contributed to the anomalous results. Based on this evaluation, the Project Manager and/or the Project Geologist, with the Project Quality Assurance (QA) Officer, will evaluate the detection limits used, the sample collection procedures, the analytical parameters, sample custody and sample documentation, and will assess whether re-analysis or re-sampling is required or whether any protocol should be modified for future sampling events. Any changes in laboratory methods, or quality assurance parameters or limits require written approval from the DTSC prior to implementation by the laboratory.

7.2.6 Data Management

New analytical data for the sampling will be generated and reported by the California State-certified laboratory. Analytical data will be provided to ENVIRON via a secure and confidential web site and will be entered and maintained in the electronic project database.

8 Human Health Screening Risk Evaluation

Consistent with USEPA and DTSC Guidance (USEPA, 1989; USEPA, 2009; DTSC, 2004; DTSC, 2006, DTSC 2008, DTSC, 2011; DTSC, 2013a; DTSC, 2013b), a HHSRE will be performed to estimate the potential chronic human health risk/hazard due to COPCs detected in soil and soil vapor at the Site. The HHSRE is intended to be a conservative, preliminary evaluation of potential risk and hazard.

The HHSRE approach consists of calculating estimated risks and hazards posed by the presence of COPCs in each medium (soil and soil vapor) using established human health risk based USEPA regional screening levels (RSLs) for residential land use as modified by the DTSC HHRA Note 3 (DTSC, 2013a; http://www.epa.gov/region9/superfund/prg/), where available. If RSLs are not available for a particular exposure pathway or receptor, SSSLs will be calculated in a manner consistent with appropriate DTSC guidance and with the approval of DTSC.

8.1 Screening Evaluation Assumptions and Exposure Factors

The assumptions and exposure factors used in the HHSRE are outlined in the sections below.

8.1.1 Exposure Scenarios and Potentially Exposed Populations

The site is currently occupied by JCES and MHS and there are no plans to use the site for other purposes. Therefore, the HHSRE will consider the school scenario consistent with DTSC guidance and will consider the potentially exposed population, also known as receptors, of school students and staff (DTSC, 2004). In addition, consistent with the DTSC PEA Guidance Manual (DTSC, 2013), unrestricted/residential land use will be considered to represent possible future exposures because this is the most health-protective and conservative land use for purposes of the HHSRE. Therefore, the HHSRE will also consider the residential receptor.

8.1.2 Exposure Pathways and Media of Exposure

As noted above, school and residential scenarios are conservatively assumed for purposes of the HHSRE. The Conceptual Site Model for the HHSRE shown in Figure 18 illustrates pathways by which receptors (residents and school students/staff) could be exposed to COPCs at the site. The PEA Guidance Manual recommends consideration of exposure to on site soil and groundwater (DTSC, 2013b). Consideration of these media is consistent with the results of previous investigations of the site, which have shown impacts to soil and localized impacts to groundwater. Since VOCs have been detected in soil and groundwater at the site previously, the potential for vapor-phase chemicals to migrate into indoor air will also be considered.

It is possible that receptors could be exposed to COPCs in soil in the following ways: incidental ingestion of shallow soil, dermal absorption from shallow soil, and inhalation of airborne dust. Since these pathways are potentially complete, they will be quantitatively evaluated in the HHSRE.

It is possible that receptors could be exposed to COPCs present in indoor air due to their migration in vapor phase from shallow soil near a building. Since this pathway is potentially complete, it will be quantitatively evaluated in the HHSRE.

AOIs where concrete and other hardscape surfaces are present to prevent direct contact to soil by current school staff and students will be identified. Soil risks estimated for these areas are considered conservative unless surface pavement will be removed in the future.

It is also theoretically possible that receptors could be exposed to groundwater by ingestion. However, since all water used at the site is provided by municipal water supply and there are no known uses of groundwater at the site, this pathway is considered incomplete and will not be quantitatively evaluated in the HHSRE.

8.1.3 Exposure Point Concentrations

An exposure point concentration (EPC) of a chemical is the estimated concentration of that chemical to which a receptor (i.e., a member of a potentially exposed population) is exposed over an assumed duration of exposure. This section describes the approach used to calculate EPCs based on the results of the investigations carried out under the PEA workplan.

To evaluate the potential for human health risks or hazards due to direct exposure to shallow soil, EPCs will be calculated based on soil concentrations, consistent with DTSC guidance (DTSC, 2004; DTSC, 2013a; DTSC, 2013b). EPCs calculated based on soil concentrations at 0-2 ft bgs will be used for evaluation of current school receptors. For hypothetical residential scenario, surface and subsurface soil data down to 10 ft bgs, will be used to calculate EPCs assuming that soil may be re-graded during redevelopment.

To evaluate the potential for human health risks or hazards due to vapor intrusion into buildings, indoor air EPCs will be calculated using the approach described in the DTSC guidance (DTSC, 2004; DTSC, 2011; CalEPA, 2012).

8.1.4 Toxicity Values

For purposes of the HHSRE, potential health risks will be calculated by comparison with the USEPA RSL values for residential land use, modified as necessary by the DTSC in HHRA Note 3. Toxicity values are included in the derivation of the RSLs. Therefore, to the extent that RSLs are used, it will not be necessary to select appropriate toxicity values.

To the extent that RSLs are not available and SSSLs must be calculated, however, it will be necessary to select appropriate toxicity values. In these cases, toxicity values will be obtained from the sources listed in the DTSC's PEA Guidance Manual (DTSC, 2013b). Toxicity values and selection methods will be subject to review and approval by DTSC.

8.1.5 Risk/Hazard Characterization

RSLs and SSSLs, collectively referred to as screening concentrations, are used to calculate potential cancer risk and hazard. For a carcinogenic chemical, the following equation is used to calculate potential cancer risk:

$$\frac{\text{Exposure Point Concentration}}{\text{Screening Concentration}} \text{ X } 10^{-6} = \text{Cancer Risk}$$

This value represents the risk, or theoretical probability, of developing cancer from that chemical upon exposure to that medium.

For a non-carcinogenic chemical, the following equation is used to calculate potential hazard:

$$\frac{\text{Exposure Point Concentration}}{\text{Screening Concentration}} = \text{Hazard Quotient}$$

The Hazard Quotient (HQ) is the ratio of the estimated dose from exposure to a compound in a medium to a value that is believed to not produce adverse health effects.

A screening estimate of the cumulative potential cancer risk for the residential receptor is calculated by adding the calculated risks for all carcinogenic COPCs for all media considered. For chemicals causing non-carcinogenic health effects, the HQs are added for all non-carcinogenic COPCs for all media considered to calculate the HI (DTSC, 2013b).

Consistent with DTSC guidance, screening estimates of the potential cancer risk and non-cancer hazard for the student and staff receptors will be calculated using the Schoolscreen spreadsheet model (http://oehha.ca.gov/public_info/public/kids.schools2604html), with toxicity value adjustments per Section 2.5.2.5 of the PEA Guidance Manual (DTSC, 2013b).

9 Reporting

Upon completion of field activities, ENVIRON will evaluate the data and document the soil, soil vapor, and groundwater sampling results in a PEA report, which will be submitted to DTSC for approval. The report will include a description of the work conducted, the results of the work, and any deviations from the scope of work. Tables summarizing the results of analytical testing and figures depicting sampling locations and results will be included in the report. The report will also include the results of the HHSRE and ENVIRON's conclusions and recommendations.

10 Schedule

Upon receipt of DTSC's approval to proceed with the PEA Work Plan, ENVIRON can conduct the tasks in accordance with the tentative schedule listed below. Note that pre-field activities can be initiated while DTSC is reviewing the PEA Work Plan. All work will be contingent on summer school schedules at the site (Proposed Malibu Summer Plan, Option B included as Appendix K), and availability of contractors:

Task Description	Schedule
Pre-Field Activities	4 weeks
Field Activities	4 to 6 weeks
Laboratory Analytical Program	4 weeks
Data Evaluation	4 weeks
Report Preparation	8 weeks

The planned fieldwork is minimally intrusive, is not expected to generate significant dust, and will not result in stockpiled soil. The potential for chemical exposures related to the fieldwork is considered to be low. All fieldwork will be conducted in accordance with the HASP. To provide maximum flexibility in schedule the fieldwork, summer school at JCES has been relocated. Summer school at MHS will be confined to a small portion of the site. In addition, athletic fields at MHS will be used during the summer. ENVIRON will conduct fieldwork in AOI's only when such are unoccupied. Depending upon the location of the fieldwork, temporary fencing may be erected around certain investigation areas. Fieldwork will be conducted so as not to interfere with the summer school and athletic field schedules.

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Tables

Table 1. Septic Systems
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Septic Tank	Pit I.D.	Original Depth (feet below ground surface)	Modified Depth (feet below ground surface)	Location	Buildings Serviced
Juan Cabrillo Elementary School					
7	7-1	44	31	West of building G	A-Administration, B-Classrooms 1-5, C-Classrooms 8-11, D-Classrooms 12-15, G-Multi-purpose, Portable Classrooms Adjacent to Basketball Courts
	7-2	41	30		
	7-3	41	32		
8	Leach Field	NA	NA	South of Building F	Building F Classrooms
9	9-1	45	36	Southeast of Classrooms 1-5	Portable Classrooms East of Classrooms 1-5
Malibu Middle/High School					
1	1-1-1	50	31	South Parking lot	A-Library, E-Classrooms 1-10, F-Music, G-Art/Wood Shop, Portable 511, Portable 512, Portable 513, I-Graphic Arts
	1-1-2	47	32		
	1-2-1	47	32		
	1-2-2	45	30		
3	3-1	50	35	Northwest of Building B/C	B/C-Administration/Attendance, D-Science and Classrooms 201-212
	3-2	50	35		
	3-3	51	36		
	3-4	53	38		
	3-5	53	38		
	3-6	54	39		
4	4-1	52	37	South of Auditorium	Kitchen/Auditorium
	4-2	52	37		
	4-3	52	37		
5	5-1	51	51	West of G/G-2	New Science Building and New Gymnasium
6	6-1-1	51	51	East of Gymnasium under basketball courts	Old Gymnasium and Track & Field Bathrooms
	6-1-2	51	51		
	6-1-3	53	53		
	6-1-4	53	53		
	6-2-1	53	53		
	6-2-2	55	55		
	6-2-3	55	55		
	6-2-4	56	56		

Table 2. Proposed Scope of Work

Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Area/Building				Media	Number of Borings[a]	Number of Samples	Depth (feet bgs)	Sampling Type	Analysis	Proposed Scope of Work	Objective
Juan Cabrillo Elementary School (JCES)	AOI-1	Buildings constructed prior to 1981	Building A (teacher's lounge, office)	Soil	43	86	0.5 and 2	Discrete	PCBs, Pesticides, Herbicides, and Lead	Collect soil samples adjacent to buildings constructed prior to 1981 in accessible exposed areas (typically grassy, planter, or sandy areas); At buildings where concrete walkways abut the side of the building, soil samples will be collected from soil as close as feasible to the edge of the concrete; Soil samples will be collected from elevated planters, adjacent to buildings; Proposed soil boring locations are evenly spaced around the buildings at intervals ranging from 20 to 25 feet and/or in areas closest to and/or across from windows where PCB-containing caulk may potentially be present.	• Evaluate the potential presence of PCBs, lead, and termiticides in exposed soil adjacent to and in close proximity to buildings constructed prior to 1981. • Evaluate the potential presence of pesticides and herbicides due to potential application of such at the site. • Perform a human health screening risk evaluation.
			Building B								
			Building C								
			Building D								
			Building E								
			Building F								
	AOI-2	Septic Systems	Septic System 7 (3 pits @ 31, 30, 32 feet bgs)	Soil and Soil Vapor	2 Soil Vapor 2 Soil	6 Soil Vapor 8 Soil	SV: 5, 15, 30 Soil: 5, 15, 25, 35	Discrete	SV: VOCs Soil: SVOCs, TPH, and Metals, Groundwater: VOCs, SVOCs, TPH, and Metals	Collect soil and soil vapor samples adjacent to leach pits associated with Septic Tanks 7, 8, and 9 and collect groundwater samples from existing monitoring wells MW-3 and MW-4 associated with Septic Tanks 8 and 9. In each boring: • Soil samples will be collected at 10-foot intervals starting at 5 feet bgs to below the base of the leach pit; • Soil vapor samples will be collected at three locations: at 5 feet bgs, near the middle of the leach pit, and near the bottom of the leach pit; Collect groundwater samples from monitoring wells MW-3 and 4.	• Evaluate potential impact to soil from septic systems and leach pits. • Determine groundwater quality in proximity to septic system 9. • Perform a human health screening risk evaluation.
			Septic System 8 (Leach Field)	Soil, Soil Vapor, and Groundwater	2 Soil Vapor 2 Soil 1 groundwater (MW-3)	2 Soil Vapor 4 Soil; 1 Groundwater	SV: 5 Soil: 5, 10				
			Septic System 9 (1 pit @ 36 feet bgs)		1 Soil Vapor 1 Soil 1 groundwater (MW-4)	3 Soil Vapor 5 Soil; 1 Groundwater	SV: 5, 20, 36 Soil: 5, 15, 25, 35, 40				
	AOI-3	Electrical Transformer	Electrical Transformer west of Building A	Soil	2	4	0.5, 2	Discrete	PCBs	Collect soil sample adjacent to transformer concrete pad	• Evaluate the potential for PCBs in soil due to potential impact from former/older transformer. • Perform a human health screening risk evaluation.
	AOI-4	Grassy and Sandy Playgrounds	Playground - grassy area	Soil	4	8	0.5, 2	Discrete	Pesticides, Herbicides, and Metals	Collect soil samples from open playground areas (grassy and sandy) where pesticides and herbicides could have been applied. Soil sample locations are randomly selected across the playing fields.	• Evaluate the potential presence of pesticides and herbicides due to potential application of such at the site. • Perform a human health screening risk evaluation.
			Drop-off - grassy area		2	4	0.5, 2				
			Area near patio/lunch		1	2	0.5, 2				
			Playground -sandy area		5	5	1				
Malibu Middle/High School (MHS)	AOI-5	Buildings constructed prior to1981	Building E	Soil	34	68	0.5, 2	Discrete	PCBs, Pesticides, Herbicides, and Lead	Collect soil samples adjacent to buildings constructed prior to 1981 in accessible exposed areas (typically grassy, planter, or sandy areas); At buildings where concrete walkways abut the side of the building, soil samples will be collected from soil as close as feasible to the edge of the concrete Soil samples will be collected from elevated planters, adjacent to buildings; Proposed soil boring locations are evenly spaced around the buildings at intervals ranging from 20 to 25 feet and/or in areas closest to and/or across from windows where PCB-containing caulk may potentially be present.	• Evaluate potential presence of PCBs, pesticides, lead, and termiticides in exposed soil by collecting soil samples. adjacent to and in proximity to buildings constructed prior to 1981 buildings that have not been previously sampled;. • Evaluate the potential presence of pesticides and herbicides due to potential application of such at the site. • Perform a human health screening risk evaluation.
			Building D								
			Building A								
			Buildings B/C								
			Building G/G2								
			Building I								
	AOI-6	Areas Previously Excavated by Arcadis	Various Buildings	Soil	19	38	0.5, 2, and for previously excavated areas just below the base of previous excavation	Discrete	PCBs, pesticides, and herbicides	Collect soil samples adjacent to soil confirmation samples collected from the sidewalls or bottom of previously excavated areas. Additionally, soil samples will be collected from the open areas where previous soil sampling was conducted	• Confirm the adequacy of the lateral and vertical extent of the excavations performed by Arcadis. • Assess and confirm previous soil sampling results conducted by Arcadis. • Perform a human health screening risk evaluation.

Table 2. Proposed Scope of Work
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Area/Building				Media	Number of Borings[a]	Number of Samples	Depth (feet bgs)	Sampling Type	Analysis	Proposed Scope of Work	Objective
Malibu Middle/High School (MHS)	AOI-7	Open areas around and in between older buildings within AOI-5	Building G/G2	Soil	27	54	0.5, 2	Discrete	Pesticides, Herbicides, and Metals	Soil samples will be collected from open areas between buildings where pesticides and herbicides could have been applied. Soil samples are randomly selected	• Evaluate potential presence of pesticides and herbicides due to potential application of such at the site. • Perform a human health screening evaluation.
			Building H								
			Open areas around and in between buildings								
	AOI-8	Neutralization Tank	Chemistry lab waste neutralization area	Soil and Soil Vapor	1 Soil Vapor 1 Soil	2 Soil Vapor 3 Soil	SV: 5, 10 Soil: 2, 5, 10	Discrete	SV: VOCs Soil: SVOCs, metals, TPH, and pH	Soil and soil vapor samples will be collected adjacent to neutralization tank to 5 feet beneath the base of the tank;	• Evaluate potential impact to soil from neutralization tank waste. • Perform a human health screening risk evaluation.
	AOI-9	Former USTs at Bus Barn	Former USTs at Bus Barn, Bus Washing Station	Soil, Soil Vapor, and Groundwater	6 Soil Vapor 4 Soil 2 Grab Groundwater samples	18 Soil Vapor 20 Soil 2 Grab Groundwater samples	Soil Vapor: 5, 20, and 35 Soil: 10, 20, 30, 40, 50 Grab Groundwater: first encountered groundwater anticipated at approximately 58 feet bgs	Discrete	SV: VOCs Soil: TPH Groundwater: VOCs and TPH	Soil and soil vapor samples will be collected adjacent to and downgradient of the former USTs. Soil samples will be collected at 10 foot intervals, starting just above the former base of the USTs (10 feet bgs) and ending at 50 feet bgs where historical soil sampling results indicated low levels of BTEX; Grab groundwater samples will be collected adjacent to the former USTs where maximum BTEX concentrations were reported in soil and hydraulically downgradient to the former USTs	• Evaluate potential impact to soil, soil vapor, and groundwater due to a release from the former diesel USTs, located at the Bus Barn area. • Perform a human health screening risk evaluation.
	AOI-10	Diesel-impacted soil stockpile	Bus Barn/Former USTs	Soil	1	1	0.5	Discrete	TPH	A soil sample will be collected from the general area where TPH-impacted soil was stockpiled on plastic after UST removal activities and prior to off-site disposal.	• Evaluate potential impact to surface soils from the previous stockpile.
	AOI-11	Grounds Shop	Grounds Shop in Bus Barn Area	Soil	1	2	0.5, 2	Discrete	TPH, pH, SVOCs, Pesticides, and Herbicides	A soil sample will be collected from inside the Maintenance Building where gasoline and herbicides are stored.	• Evaluate potential I impact to soil from Maintenance Building operations. • Perform a human health screening risk evaluation.
	AOI-12	Septic Systems	Septic System 1-1 and 1-2 (4 pits @ 31,32,32,30 feet bgs)	Soil, Soil Vapor, and Groundwater	3 Soil Vapor 3 soil	9 Soil Vapor 12 soil	SV: 5, 20, 35 Soil: 5, 15, 25, 35	Discrete	SV: VOCs Soil: SVOCs, TPH, Metals Groundwater: VOCs, SVOCs, TPH, and Metals	Collect soil and soil vapor samples adjacent to leach pits associated with Septic Tanks 1, 3, 4, 5, 6, and 11. In each boring: Soil samples will be collected at 10-foot intervals starting at 5 feet bgs to below or adjacent to the base of the leach pit; Soil vapor samples will be collected at three locations: at 5 feet bgs, near the middle of the leach pit, and near the bottom of the leach pit. Collect groundwater samples from existing wells MW-3 though MW-7, MW-10, and MW-11.	• Evaluate potential impact to soil from septic systems and leach pits. • Determine groundwater quality in proximity to septic systems1, 3, and 5. • Perform a human health screening risk evaluation.
			Septic System 3-1 and 3-2 (6 pits @ 35, 35, 36, 38, 38, 39 feet bgs)		3 Soil Vapor 3 soil	9 Soil Vapor 15 soil	SV: 5, 20, 40 Soil: 5, 15, 25, 35, 40				
			Septic System 4 (3 pits @ 37 feet bgs)		2 Soil Vapor 2 soil	6 Soil Vapor 10 soil	SV: 5, 20, 40 Soil: 5, 15, 25, 35, 40				
			Septic system 5 (1 pit @ 51 feet bgs)		1 Soil Vapor 1 soil	3 Soil Vapor 6 soil	SV: 5, 20, 50 Soil: 5, 15, 25, 35, 45, 55				
			Septic system 6 -1 and 6-2 (8 pits @ 51, 51, 53, 53, 53, 55, 55, 41 feet bgs)		4 Soil Vapor 4 soil	12 Soil Vapor 24 soil	SV: 5, 25, 55 Soil: 5, 15, 25, 35, 45, 55				
			Septic system 11 (1 pit @ 21 feet bgs)		1 Soil Vapor 1 soil	3 Soil Vapor 3 soil	SV: 5, 10, 20 Soil: 5, 15, 25				

Table 2. Proposed Scope of Work
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Area/Building				Media	Number of Borings[a]	Number of Samples	Depth (feet bgs)	Sampling Type	Analysis	Proposed Scope of Work	Objective
Malibu Middle/High School (MHS)	AOI-13	Retention Basin	Retention Basin located in the northern parking lot	Soil	1	1	Surface soil	Discrete	SVOCs, TPH, and Metals	Collect surface soil sample adjacent to the discharge pipe.	• Evaluate the potential that runoff from the parking lot has impacted the retention basin. • Perform a human health screening risk evaluation.
Malibu Middle/High School (MHS)	AOI-14	Athletic fields	Football/Baseball/softball and soccer fields	Soil	300	9	0.5	Incremental	Pesticides, Herbicides, and Metals	Incremental soil sampling will be conducted on the athletic fields where mean COPC concentrations can be used to evaluate potential health risks. The athletic fields will be divided into three Decision Units (DUs) for sampling purposes: (1) the football field (40 increments); (2) the large baseball field (30 increments); and (3) the upper softball/soccer field areas (30 increments).	• Evaluate the potential presence of pesticides, herbicides, and metals in exposed soil. • Perform a human health screening risk evaluation.
Malibu Middle/High School (MHS)	AOI-15	Cornucopia	Cornucopia	Soil	4	8	0.5, 2	Discrete	Pesticides, Herbicides, and Metals	Collect two soil samples in the growing beds and two soil samples in random areas. Soil sample selection within the growing bed was based on the direct contact with the soil when gardening. Soil sampling is also proposed in areas where pesticides and herbicides could have historically been used.	• Evaluate the potential for pesticides, herbicides, and metals in exposed soil. • Perform a human health screening risk evaluation.
Malibu Middle/High School (MHS)	AOI-16	Undeveloped Area - Building E	Open Undeveloped Area between Building E and football field	Soil	3	3	0.5	Discrete	Pesticides, Herbicides, and Metals	Soil samples will be collected in areas that students traverse where pesticides and herbicides could have historically been used. Soil sample locations will be randomly selected.	• Evaluate the potential presence for pesticides, herbicides, and metals in exposed soil. • Perform a human health screening risk evaluation.
Malibu Middle/High School (MHS)	AOI-17	Electrical Transformers	Electrical Transformer north of "Boys and Girls Club"; Electrical Transformers (2) west of Food Service/Kitchen Building	Soil	6	12	0.5, 2	Discrete	PCBs	Collect soil samples adjacent to the concrete pad where the transformers are situated (two soil samples for each concrete pad area).	• Evaluate the potential of PCBs in soil due to potential impact from former/older transformer. • Perform a human health screening risk evaluation.
Malibu Middle/High School (MHS)	AOI-18	Redevelopment Area	New parking lot and modified stairs visitor's parking	Soil	4	8	0.5 and 2	Composite	Pesticides, Herbicides, and Metals	Soil samples will be collected from an undeveloped area where pesticides and herbicides could have been applied. This undeveloped area is proposed for future redevelopment as a parking lot. Four soil samples will be collected from random locations at each proposed depths and composite into one sample per depth.	• Evaluate the potential for pesticides, herbicides, and metals in soil prior to ground disturbance for grading in areas not previously evaluated under another AOI.
Malibu Middle/High School (MHS)	AOI-18	Redevelopment Area	New Bleachers	Soil	2	4	0.5, 2	Composite	Pesticides, Herbicides, and Metals	Soil samples will be collected from an undeveloped area where pesticides and herbicides could have been applied. This undeveloped area is proposed for future redevelopment as new bleachers. Two soil samples will be collected from random locations at each proposed depth and composite into one sample per depth.	
Malibu Middle/High School (MHS)	AOI-18	Redevelopment Area	New Tennis Court	Soil	4	8	0.5 and 2	Composite	Pesticides, Herbicides, and Metals	Soil samples will be collected from an undeveloped area where pesticides and herbicides could have been applied. This undeveloped area is proposed for future redevelopment as a tennis court . Four soil samples will be collected from random locations at each proposed depths and composited into one sample per depth. Sampling methodology was based on the size of the area, its future use by students, and future proposed surface (concrete)	
Malibu Middle/High School (MHS)	AOI-18	Redevelopment Area	New Student Drop-off	Soil	2	4	0.5, 2	Composite	Pesticides, Herbicides, and Metals	Soil samples will be collected from an undeveloped area where pesticides and herbicides could have been applied. Two soil samples will be collected from random locations at each proposed depth and composite into one sample per depth.	

Table 2. Proposed Scope of Work
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Area/Building				Media	Number of Borings[a]	Number of Samples	Depth (feet bgs)	Sampling Type	Analysis	Proposed Scope of Work	Objective
Malibu Middle/High School (MHS)	AOI-18	Redevelopment Area	New I.T. Room	It is being evaluated as part of AOIs 6 and 7							
			New Ramp and Stairs	It is being evaluated as part of AOI 16							
			Middle School Quad	It is being evaluated as part of AOIs 6 and 7							
			High School Quad	It is being evaluated as part of AOIs 6 and 7							

Notes:
Polychlorinated Biphenyls (PCBs) will be analyzed using USEPA analytical method 8082A
Pesticides will be analyzed by USEPA analytical methods 8141 (organophosphates) and 8081 (organochlorine)
Herbicides will be analyzed by USEPA analytical method 8151
Semi-volatile organic compounds (SVOCs) will be analyzed by USEPA analytical method 8270C
Total petroleum hydrocarbons (TPH) will be analyzed by USEPA analytical method 8015 M
Volatile organic compounds (VOCs) will be analyzed by USEPA analytical method 8260B modified
Metals will be analyzed by USEPA analytical method 6010/7000
USEPA - United States Environmental Protection Agency (USEPA)
SV - Soil Vapor
bgs - below ground surface
BTEX - benzene, toluene, ethybenzene, and xylenes
UST - underground storage
[a] Soil, soil vapor, and grab groundwater sampling locations depicted on Figure 17 are approximate and may be adjusted in the field due to access constraints and/or locations of features of interest (e.g. windows, leach pits, etc.).

Table 3. Analytical Methods and Sample Collection Requirements
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Medium Analyzed	Analytical Method	Specific Analysis	Preservative	Holding Time	Sample Weight and/or Volume Needed for Analysis (grams and/or mL)	Sample Containers
Soil	SVOCs	USEPA Method 8270C	Chill to 4 ± 2°	14 Days	300	one 8-oz jar or one 2" by 6" acetate/brass sleeve
	Pesticides	USEPA Method 8141 and 8081		14 Days		
	Herbicides	USEPA Method 8151		14 Days		
	PCBs	USEPA Method 8082A		14 Days		
	Metals (including lead)	USEPA Method 6010B/7471A		180 Days	5	one 4-oz jar
	TPH	USEPA Method 8015B		7 Days	15	one 8-oz jar or one 2" by 6" acetate/brass sleeve
	pH	USEPA Method 9045		Immediately upon sample receipt by the laboratory	20	
Soil Vapor[a]	VOCs	USEPA Method 8260 Modified	NA	NA		Syringe
Groundwater	VOCs	USEPA Method 8260B	HCL	14 days	3 x 40 mL	Glass Container
	SVOCs	USEPA Method 8270C	None	7 days	1 Liter	Amber
	TPH	USEPA Method 8015M (gas)	HCL	14 days	3 x 40 mL	Glass Container
		USEPA Method 8015M (Diesel/Mo)	None	7 day extraction 40 days to analyze	2 x 1,000 mL	Glass Container
	Metals	USEPA Method 6010B/7471A	HNO3	180 days	250 Ml	HDPE

Notes:
SVOCs - semi-volatile organic compounds
PCBs - polychlorinated biphenyls
TPH - total petroleum hydrocarbons
VOCs - volatile organic compounds
USEPA - United States Environmental Protection Agency
[a] Soil vapor samples will be analyzed using an on-site California state certified mobile laboratory
NA - not applicable
HCL - hydrochloric Acid
HNO3 - nitric acid
mL - milliliters
Mo - Motor oil
HDPE - high density polyethylene

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Table 4A. Method Detection Limits and Reporting Limits in Soil
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Semivolatile Organic Compounds (SVOCs)				
1,2,4-Trichlorobenzene	8270C	µg/kg	133	330
1,2-Dichlorobenzene			60	330
1,2-Diphenylhydrazine(as Azobenzene)			60	330
1,3-Dichlorobenzene			133	330
1,4-Dichlorobenzene			133	330
2,4,5-Trichlorophenol			130	330
2,4,6-Trichlorophenol			75	330
2,4-Dichlorophenol			67	330
2,4-Dimethylphenol			130	330
2,4-Dinitrophenol			330	660
2,4-Dinitrotoluene			80	330
2,6-Dinitrotoluene			95	330
2-Chloronaphthalene			67	330
2-Chlorophenol			70	330
2-Methylnaphthalene			70	330
2-Methylphenol			80	330
2-Nitroaniline			67	330
2-Nitrophenol			133	330
3,3'-Dichlorobenzidine			150	830
3-Nitroaniline			133	330
4,6-Dinitro-2-methylphenol			133	420
4-Bromophenyl phenyl ether			75	330
4-Chloro-3-methylphenol			70	330
4-Chloroaniline			133	330
4-Chlorophenyl phenyl ether			85	330
3-Methylphenol + 4-Methylphenol			133	330
4-Nitroaniline			133	830
4-Nitrophenol			140	830
Acenaphthene			67	330
Acenaphthylene			70	330
Aniline			85	420
Anthracene			80	330
Benzidine*			660	1340
Benzo[a]anthracene			70	330
Benzo[a]pyrene			67	330
Benzo[b]fluoranthene			67	330
Benzo[g,h,i]perylene*			110	330
Benzo[k]fluoranthene			70	330
Benzoic acid			150	830
Benzyl alcohol			150	330
Bis(2-chloroethoxy)methane			133	330
Bis(2-chloroethyl)ether			60	330
Bis(2-ethylhexyl) phthalate			90	330
Butyl benzyl phthalate			80	330
Chrysene			75	330
Dibenz(a,h)anthracene*			100	420
Dibenzofuran			67	330
Diethyl phthalate			95	330
Dimethyl phthalate			67	330
Di-n-butyl phthalate			90	330
Di-n-octyl phthalate			90	330
Fluoranthene			70	330
Fluorene			70	330
Hexachlorobenzene			70	330
Hexachlorobutadiene			133	330
Hexachlorocyclopentadiene			133	830
Hexachloroethane			133	330
Indeno[1,2,3-cd]pyrene			130	330
Isophorone			67	330
Naphthalene			67	330
Nitrobenzene			70	330
N-Nitrosodi-n-propylamine			70	250
N-Nitrosodiphenylamine			80	330
Pentachlorophenol			150	830
Phenanthrene			67	330
Phenol			90	330
Pyrene			80	330
Bis (2-chloroisopropyl) ether			133	330

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Table 4A. Method Detection Limits and Reporting Limits in Soil
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Metals				
Antimony	6010/7000	mg/kg	5	10
Arsenic*			1.5	3
Barium			0.75	1.5
Beryllium			0.25	0.5
Cadmium			0.25	0.5
Chromium			0.5	1
Cobalt			0.5	1
Copper			1	2
Lead			1	2
Molybdenum			1	2
Nickel			1	2
Selenium			1.5	3
Thallium*			5	10
Vanadium			0.5	1
Zinc			2.5	5
Silver			0.75	1.5
Mercury	7471A		0.02	0.012
Organochlorine Pesticides				
4,4'-DDD	8081A	µg/kg	1.5	5
4,4'-DDE			1.5	5
4,4'-DDT			1.5	5
Aldrin			1.5	5
alpha-BHC			1.5	5
beta-BHC			1.5	5
Chlordane (technical)			10	50
delta-BHC			1.5	10
Dieldrin			1.5	5
Endosulfan I			1.5	5
Endosulfan II			1.5	5
Endosulfan sulfate			2	10
Endrin			1.5	5
Endrin aldehyde			1.5	5
Endrin ketone			2	5
gamma-BHC (Lindane)			1.5	5
Heptachlor			2	5
Heptachlor epoxide			2	5
Methoxychlor			1.5	5
Toxaphene			50	200
Organophosphorous Pesticides				
Azinphos-methyl	8014A	µg/kg	3.11	33
Bolstar			3.12	33
Chlorpyrifos			3.24	33
Coumaphos			3.16	33
Demeton, Total			6	66
Diazinon			3.25	33
Dichlorvos			2.93	33
Dimethoate			3.18	33
Disulfoton			3.54	33
EPN			2.88	33
Famphur			3.22	33
Fensulfothion			2.55	33
Fenthion			3.14	33
Malathion			3.14	33
Methyl parathion			2.9	33
Mevinphos			3.14	33
O,O,O-Triethyl phosphorothioate			3.2	33
Parathion			2.64	33
Phorate			3.33	33
Ronnel			3.12	33
Stirophos			3.34	33
Sulfotepp			3.19	33
Tokuthion			3.25	33
Trichloronate			3.89	33
Mocap			3.23	33
Thionazin			3.23	33
Herbicides				
2,4-D	8151A	µg/kg	5.47	80
2,4,5-T			2.51	20
Silvex (2,4,5-TP)			2.1	20

Table 4A. Method Detection Limits and Reporting Limits in Soil
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Polychlorinated Biphenyls (PCBs)				
Aroclor 1016	8082A	µg/kg	17	50
Aroclor 1221			17	50
Aroclor 1232			17	50
Aroclor 1242			17	50
Aroclor 1248			17	50
Aroclor 1254			17	50
Aroclor 1260			17	50
Chlorinated Biphenyl (PCB) Congeners				
PCB-1	1668A	pg/g	1.00	20.0
PCB-2			1.00	20.0
PCB-3			5.00	20.0
PCB-4			5.00	20.0
PCB-5			5.00	20.0
PCB-6			5.00	20.0
PCB-7			5.00	20.0
PCB-8			1.00	20.0
PCB-9			1.00	20.0
PCB-10			5.00	20.0
PCB-11			10.0	20.0
PCB-12			10.0	40.0
PCB-13			10.0	40.0
PCB-14			5.00	20.0
PCB-15			5.00	20.0
PCB-16			1.00	20.0
PCB-17			1.00	20.0
PCB-18			10.0	40.0
PCB-19			1.00	20.0
PCB-20			10.0	40.0
PCB-21			2.00	40.0
PCB-22			1.00	20.0
PCB-23			1.00	20.0
PCB-24			1.00	20.0
PCB-25			1.00	20.0
PCB-26			2.00	40.0
PCB-27			1.00	20.0
PCB-28			10.0	40.0
PCB-29			2.00	40.0
PCB-30			10.0	40.0
PCB-31			5.00	20.0
PCB-32			1.00	20.0
PCB-33			2.00	40.0
PCB-34			1.00	20.0
PCB-35			1.00	20.0
PCB-36			1.00	20.0
PCB-37			1.00	20.0
PCB-38			1.00	20.0
PCB-39			1.00	20.0
PCB-40			2.00	40.0
PCB-41			1.00	20.0
PCB-42			1.00	20.0
PCB-43			1.00	20.0
PCB-44			3.00	60.0
PCB-45			1.00	20.0
PCB-46			1.00	20.0
PCB-47			3.00	60.0
PCB-48			1.00	20.0
PCB-49			2.00	40.0
PCB-50			2.00	40.0
PCB-51			1.00	20.0
PCB-52			5.00	20.0
PCB-53			2.00	40.0
PCB-54			1.00	20.0
PCB-55			1.00	20.0
PCB-56			1.00	20.0
PCB-57			1.00	20.0
PCB-58			1.00	20.0
PCB-59			3.00	60.0
PCB-60			1.00	20.0
PCB-61			4.00	80.0
PCB-62			3.00	60.0
PCB-63			1.00	20.0
PCB-64			1.00	20.0
PCB-65			3.00	60.0

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Table 4A. Method Detection Limits and Reporting Limits in Soil
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Chlorinated Biphenyl (PCB) Congeners *(Continued)*				
PCB-66	1668A	pg/g	5.00	20.0
PCB-67			1.00	20.0
PCB-68			1.00	20.0
PCB-69			2.00	40.0
PCB-70			4.00	80.0
PCB-71			2.00	40.0
PCB-72			1.00	20.0
PCB-73			1.00	20.0
PCB-74			4.00	80.0
PCB-75			3.00	60.0
PCB-76			4.00	80.0
PCB-77			1.00	2.00
PCB-78			1.00	20.0
PCB-79			1.00	20.0
PCB-80			1.00	20.0
PCB-81			1.00	2.00
PCB-82			1.00	20.0
PCB-83			1.00	20.0
PCB-84			1.00	20.0
PCB-85			3.00	60.0
PCB-86			6.00	120
PCB-87			6.00	120
PCB-88			2.00	40.0
PCB-89			1.00	20.0
PCB-90			3.00	60.0
PCB-91			2.00	40.0
PCB-92			1.00	20.0
PCB-93			2.00	40.0
PCB-94			1.00	20.0
PCB-95			1.00	20.0
PCB-96			1.00	20.0
PCB-97			6.00	120
PCB-98			2.00	40.0
PCB-99			1.00	20.0
PCB-100			2.00	40.0
PCB-101			3.00	60.0
PCB-102			2.00	40.0
PCB-103			1.00	20.0
PCB-104			1.00	20.0
PCB-105			1.00	2.00
PCB-106			1.00	20.0
PCB-107			2.00	40.0
PCB-108			6.00	120
PCB-109			1.00	20.0
PCB-110			2.00	40.0
PCB-111			1.00	20.0
PCB-112			1.00	20.0
PCB-113			3.00	60.0
PCB-114			1.00	2.00
PCB-115			2.00	40.0
PCB-116			3.00	60.0
PCB-117			3.00	60.0
PCB-118			1.00	2.00
PCB-119			6.00	120
PCB-120			1.00	20.0
PCB-121			1.00	20.0
PCB-122			1.00	20.0
PCB-123			1.00	2.00
PCB-124			2.00	40.0
PCB-125			6.00	120
PCB-126			1.00	2.00
PCB-127			1.00	20.0
PCB-128			2.00	40.0
PCB-129			3.00	60.0
PCB-130			1.00	20.0
PCB-131			1.00	20.0
PCB-132			1.00	20.0
PCB-133			1.00	20.0
PCB-134			2.00	40.0
PCB-135			2.00	40.0

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Table 4A. Method Detection Limits and Reporting Limits in Soil
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Chlorinated Biphenyl (PCB) Congeners *(Continued)*				
PCB-136	1668A	pg/g	1.00	20.0
PCB-137			1.00	20.0
PCB-138			3.00	60.0
PCB-139			2.00	40.0
PCB-140			2.00	40.0
PCB-141			1.00	20.0
PCB-142			1.00	20.0
PCB-143			2.00	40.0
PCB-144			1.00	20.0
PCB-145			1.00	20.0
PCB-146			1.00	20.0
PCB-147			2.00	40.0
PCB-148			1.00	20.0
PCB-149			1.00	40.0
PCB-150			1.00	20.0
PCB-151			2.00	40.0
PCB-152			1.00	20.0
PCB-153			2.00	40.0
PCB-154			1.00	20.0
PCB-155			1.00	20.0
PCB-156			2.00	4.00
PCB-157			2.00	4.00
PCB-158			1.00	20.0
PCB-159			1.00	20.0
PCB-160			1.00	20.0
PCB-161			1.00	20.0
PCB-162			1.00	20.0
PCB-163			3.00	60.0
PCB-164			1.00	20.0
PCB-165			1.00	20.0
PCB-166			2.00	40.0
PCB-167			1.00	2.00
PCB-168			2.00	40.0
PCB-169			1.00	2.00
PCB-170			1.00	20.0
PCB-171			2.00	40.0
PCB-172			1.00	20.0
PCB-173			2.00	40.0
PCB-174			1.00	20.0
PCB-175			1.00	20.0
PCB-176			1.00	20.0
PCB-177			1.00	20.0
PCB-178			1.00	20.0
PCB-179			1.00	20.0
PCB-180			2.00	40.0
PCB-181			1.00	20.0
PCB-182			1.00	20.0
PCB-183			1.00	20.0
PCB-184			1.00	20.0
PCB-185			1.00	20.0
PCB-186			1.00	20.0
PCB-187			1.00	20.0
PCB-188			1.00	20.0
PCB-189			1.00	2.00
PCB-190			1.00	20.0
PCB-191			1.00	20.0
PCB-192			1.00	20.0
PCB-193			2.00	40.0
PCB-194			1.00	20.0
PCB-195			1.00	20.0
PCB-196			1.00	20.0
PCB-197			1.00	20.0
PCB-198			2.00	40.0
PCB-199			2.00	40.0
PCB-200			1.00	20.0
PCB-201			1.00	20.0
PCB-202			1.00	20.0
PCB-203			1.00	20.0
PCB-204			1.00	20.0
PCB-205			1.00	20.0

Table 4A. Method Detection Limits and Reporting Limits in Soil
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Chlorinated Biphenyl (PCB) Congeners *(Continued)*				
PCB-206	1668A	pg/g	1.00	20.0
PCB-207			1.00	20.0
PCB-208			1.00	20.0
PCB-209			1.00	20.0
Total Petroleum Hydrocarbons - Gasoline Range Organics				
GRO (C4-C12)	8015M	µg/kg	150	400
Total Petroleum Hydrocarbons - Diesel Range Organics				
DRO (C13-C22)	8015M	mg/kg	2.5	5
Total Petroleum Hydrocarbons - Oil Range Organics				
ORO (C23-C40)	8015M	mg/kg	2.5	5

Notes:
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
USEPA - United States Environmental Protection Agency
* Method Detection Limit cannot meet established Regional Screening Levels for that compound

Table 4B. Method Detection Limits and Reporting Limits in Soil Vapor
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Volatile Organic Compounds				
Benzene	8260B	µg/L	0.008	0.008
Bromobenzene			0.008	0.008
Bromodichloromethane			0.008	0.008
Bromoform			0.008	0.008
n-Butylbenzene			0.008	0.008
sec-Butylbenzene			0.008	0.008
tert-Butylbenzene			0.008	0.008
Carbon Tetrachloride			0.008	0.008
Chlorobenzene			0.008	0.008
Chloroform			0.008	0.008
2-Chlorotoluene			0.008	0.008
4-Chlorotoluene			0.008	0.008
Dibromochloromethane			0.008	0.008
1,2-Dibromo-3-Chloropropane			0.008	0.008
1,2-Dibromoethane (EDB)			0.008	0.008
Dibromomethane			0.008	0.008
1,2-Dichlorobenzene			0.008	0.008
1,3-Dichlorobenzene			0.008	0.008
1,4-Dichlorobenzene			0.008	0.008
Dichlorodifluoromethane			0.008	0.008
1,1-Dichloroethane			0.008	0.008
1,2-Dichloroethane			0.008	0.008
1,1-Dichloroethene			0.008	0.008
cis-1,2-Dichloroethene			0.008	0.008
trans-1,2-Dichloroethene			0.008	0.008
1,2-Dichloropropane			0.008	0.008
1,3-Dichloropropane			0.008	0.008
2,2-Dichloropropane			0.008	0.008
1,1-Dichloropropene			0.008	0.008
cis-1,3-Dichloropropene			0.008	0.008
trans-1,3-Dichloropropene			0.008	0.008
Ethylbenzene			0.008	0.008
Freon 113			0.040	0.040
Hexachlorobutadiene			0.008	0.008
Isopropylbenzene			0.008	0.008
4-Isopropyltoluene			0.008	0.008
Methylene Chloride			0.008	0.008
Naphthalene			0.008	0.008
n-Propylbenzene			0.008	0.008
Styrene			0.008	0.008
1,1,1,2-Tetrachloroethane			0.008	0.008

Table 4B. Method Detection Limits and Reporting Limits in Soil Vapor
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Volatile Organic Compounds				
1,1,2,2-Tetrachloroethane	8260B	µg/L	0.008	0.008
Tetrachloroethylene			0.008	0.008
Toluene			0.008	0.008
1,2,3-Trichlorobenzene			0.008	0.008
1,2,4-Trichlorobenzene			0.008	0.008
1,1,1-Trichloroethane			0.008	0.008
1,1,2-Trichloroethane			0.008	0.008
Trichloroethylene			0.008	0.008
Trichlorofluoromethane			0.008	0.008
1,2,3-Trichloropropane			0.008	0.008
1,2,4-Trimethylbenzene			0.008	0.008
1,3,5-Trimethylbenzene			0.008	0.008
Vinyl Chloride			0.008	0.008
Xylenes			0.008	0.008
Methyl-t-Butyl Ether (MTBE)			0.040	0.040
Ethyl-tert-butylether (ETBE)			0.040	0.040
Di-isopropylether (DIPE)			0.040	0.040
Tert-amylmethylether (TAME)			0.040	0.040
Tert- Butylalcohol (TBA)			0.40	0.40
TPH Gasoline Range			0.080	0.080
n-Propanol			0.080	0.080
n-Pentane			0.008	0.008

Notes:
µg/L - micrograms per liter
USEPA - United States Environmental Protection Agency

Table 4C. Method Detection Limits and Reporting Limits in Groundwater
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Volatile Organic Compounds				
1,1,1,2-Tetrachloroethane	8260B	µg/L	0.250	1.00
1,1,1-Trichloroethane			0.250	1.00
1,1,2,2-Tetrachloroethane			0.250	1.00
1,1,2-Trichloroethane			0.250	1.00
1,1-Dichloroethane			0.250	1.00
1,1-Dichloroethene			0.250	1.00
1,1-Dichloropropene			0.250	1.00
1,2,3-Trichlorobenzene			0.400	1.00
1,2,3-Trichloropropane			0.250	1.00
1,2,4-Trichlorobenzene			0.400	2.00
1,2,4-Trimethylbenzene			0.250	1.00
1,2-Dibromo-3-Chloropropane			0.500	2.00
1,2-Dibromoethane (EDB)			0.250	1.00
1,2-Dichlorobenzene			0.500	2.00
1,2-Dichloroethane			0.250	0.500
1,2-Dichloropropane			0.250	1.00
1,3,5-Trimethylbenzene			0.250	1.00
1,3-Dichlorobenzene			0.250	1.00
1,3-Dichloropropane			0.250	1.00
1,4-Dichlorobenzene			0.250	1.00
2,2-Dichloropropane			0.250	2.00
2-Chlorotoluene			0.250	1.00
4-Chlorotoluene			0.250	1.00
Benzene			0.250	0.500
Bromobenzene			0.250	1.00
Bromochloromethane			0.250	1.00
Bromodichloromethane			0.250	1.00
Bromoform			0.250	2.00
Bromomethane			0.250	1.00
Carbon tetrachloride			0.250	0.500
Chlorobenzene			0.250	1.00
Chloroethane			0.250	1.00
Chloroform			0.250	1.00
Chloromethane			0.250	1.00
cis-1,2-Dichloroethene			0.250	1.00
cis-1,3-Dichloropropene			0.250	0.500
Dibromochloromethane			0.250	1.00
Dibromomethane			0.250	1.00
Dichlorodifluoromethane			0.250	1.00
Ethylbenzene			0.250	1.00
Hexachlorobutadiene			0.250	1.00
Isopropylbenzene			0.250	1.00
m,p-Xylene			0.500	2.00
Methylene Chloride			0.880	5.00
Naphthalene			0.400	2.00
n-Butylbenzene			0.400	2.00
N-Propylbenzene			0.250	1.00
o-Xylene			0.250	1.00
p-Isopropyltoluene			0.250	1.00
Styrene			0.250	1.00
sec-Butylbenzene			0.250	1.00
tert-Butylbenzene			0.250	1.00
Tetrachloroethene			0.250	1.00
Toluene			0.250	1.00
trans-1,2-Dichloroethene			0.250	1.00
trans-1,3-Dichloropropene			0.250	0.500
Trichloroethene			0.250	1.00
Trichlorofluoromethane			0.250	1.00
Vinyl chloride			0.250	0.500

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Table 4C. Method Detection Limits and Reporting Limits in Groundwater
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Semivolatile Organic Compounds (SVOCs)				
Acenaphthene	8270C	µg/L	0.200	0.500
Acenaphthylene			0.200	0.500
Aniline			2.00	10.0
Anthracene			0.200	0.500
Benzidine			5.00	10.0
Benzo[a]anthracene			2.00	5.00
Benzo[a]pyrene			0.500	2.00
Benzo[b]fluoranthene			1.00	2.00
Benzo[g,h,i]perylene			2.00	5.00
Benzoic acid			2.00	5.00
Benzo[k]fluoranthene			0.250	0.500
Benzyl alcohol			2.00	5.00
Bis(2-chloroethoxy)methane			0.200	0.500
Bis(2-chloroethyl)ether			0.200	0.500
bis (2-chloroisopropyl) ether			0.200	0.500
Bis(2-ethylhexyl) phthalate			2.00	5.00
4-Bromophenyl phenyl ether			0.500	1.00
Butyl benzyl phthalate			2.00	5.00
4-Chloroaniline			1.00	2.00
4-Chloro-3-methylphenol			0.200	2.00
2-Chloronaphthalene			0.200	0.500
2-Chlorophenol			0.500	1.00
4-Chlorophenyl phenyl ether			0.200	0.500
Chrysene			0.200	0.500
Dibenz(a,h)anthracene			0.250	0.500
Dibenzofuran			0.200	0.500
1,2-Dichlorobenzene			0.200	0.500
1,3-Dichlorobenzene			0.200	0.500
1,4-Dichlorobenzene			0.200	0.500
3,3'-Dichlorobenzidine			2.00	5.00
2,4-Dichlorophenol			1.00	2.00
Diethyl phthalate			0.500	1.00
2,4-Dimethylphenol			1.00	2.00
Dimethyl phthalate			0.250	0.500
Di-n-butyl phthalate			1.00	2.00
4,6-Dinitro-2-methylphenol			2.00	5.00
2,4-Dinitrophenol			2.00	5.00
2,4-Dinitrotoluene			2.00	5.00
2,6-Dinitrotoluene			2.00	5.00
Di-n-octyl phthalate			2.00	5.00
1,2-Diphenylhydrazine(as Azobenzer			0.500	1.00
Fluoranthene			0.200	0.500
Fluorene			0.200	0.500
Hexachlorobenzene			0.500	1.00
Hexachlorobutadiene			0.500	2.00
Hexachlorocyclopentadiene			2.00	5.00
Hexachloroethane			0.500	3.00
Indeno[1,2,3-cd]pyrene			1.00	2.00
Isophorone			0.500	1.00
2-Methylnaphthalene			0.500	1.00
2-Methylphenol			1.00	2.00
3-Methylphenol + 4-Methylphenol			2.00	5.00
Naphthalene			0.500	1.00
2-Nitroaniline			2.00	5.00
3-Nitroaniline			2.00	5.00
4-Nitroaniline			2.00	5.00
Nitrobenzene			0.500	1.00
2-Nitrophenol			1.00	2.00
4-Nitrophenol			2.00	5.00
N-Nitrosodi-n-propylamine			1.00	2.00

Table 4C. Method Detection Limits and Reporting Limits in Groundwater
Juan Cabrillo Elementary School and Malibu Middle/High School
30237 and 30215 Morning View Drive
Malibu, California

Parameter	USEPA Method	Units	Method Detection Limit	Reporting Limit
Semivolatile Organic Compounds (SVOCs) *(Continued)*				
N-Nitrosodiphenylamine	8270C	µg/L	0.500	1.00
Pentachlorophenol			1.00	2.00
Phenanthrene			0.200	0.500
Phenol			0.500	1.00
Pyrene			0.200	0.500
1,2,4-Trichlorobenzene			0.500	1.00
2,4,5-Trichlorophenol			1.00	2.00
2,4,6-Trichlorophenol			0.500	1.00
Metals				
Antimony	6010/7000	mg/L	0.00600	0.0100
Arsenic			0.00500	0.0100
Barium			0.00500	0.0100
Beryllium			0.00100	0.00200
Cadmium			0.00200	0.00500
Chromium			0.00250	0.00500
Cobalt			0.00250	0.0100
Copper			0.00500	0.0100
Lead			0.00250	0.00500
Molybdenum			0.0100	0.0200
Nickel			0.00500	0.0100
Selenium			0.00610	0.0100
Silver			0.00500	0.0100
Thallium			0.00500	0.0100
Vanadium			0.00500	0.0100
Zinc			0.0100	0.0200
Mercury	7471A		0.02	< 0.00020
Total Petroleum Hydrocarbons - Gasoline Range Organics				
TPH GRO (C4-C12)	8015B	µg/L	25	50
Total Petroleum Hydrocarbons - Diesel Range Organics				
TPH DRO (C13-C22)	8015B	mg/L	0.1	0.5
Total Petroleum Hydrocarbons - Oil Range Organics				
TPH ORO (C23-C40)	8015B	mg/L	0.1	0.5

Notes
µg/L - micrograms per liter
USEPA - United States Environmental Protection Agency
mg/L - milligram per liter

Figures

SOURCE:
National Geographic World Map
ESRI ArcGIS Online
© 2010 National Geographic Society
Reference Data: National Geographic, Esri, DeLorme, HERE, iPC, NRCAN, METI

Map Created with ESRI ArcMap and National Geographic TOPO!™ ©2001 National Geographic Holdings [www.topo.com]

0 0.5 1 MILES

2,500 0 2,500 5,000 7,500 10,000 FEET

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
1:40,000

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 1 - Site Vicinity Map - 2014-10-13.mxd

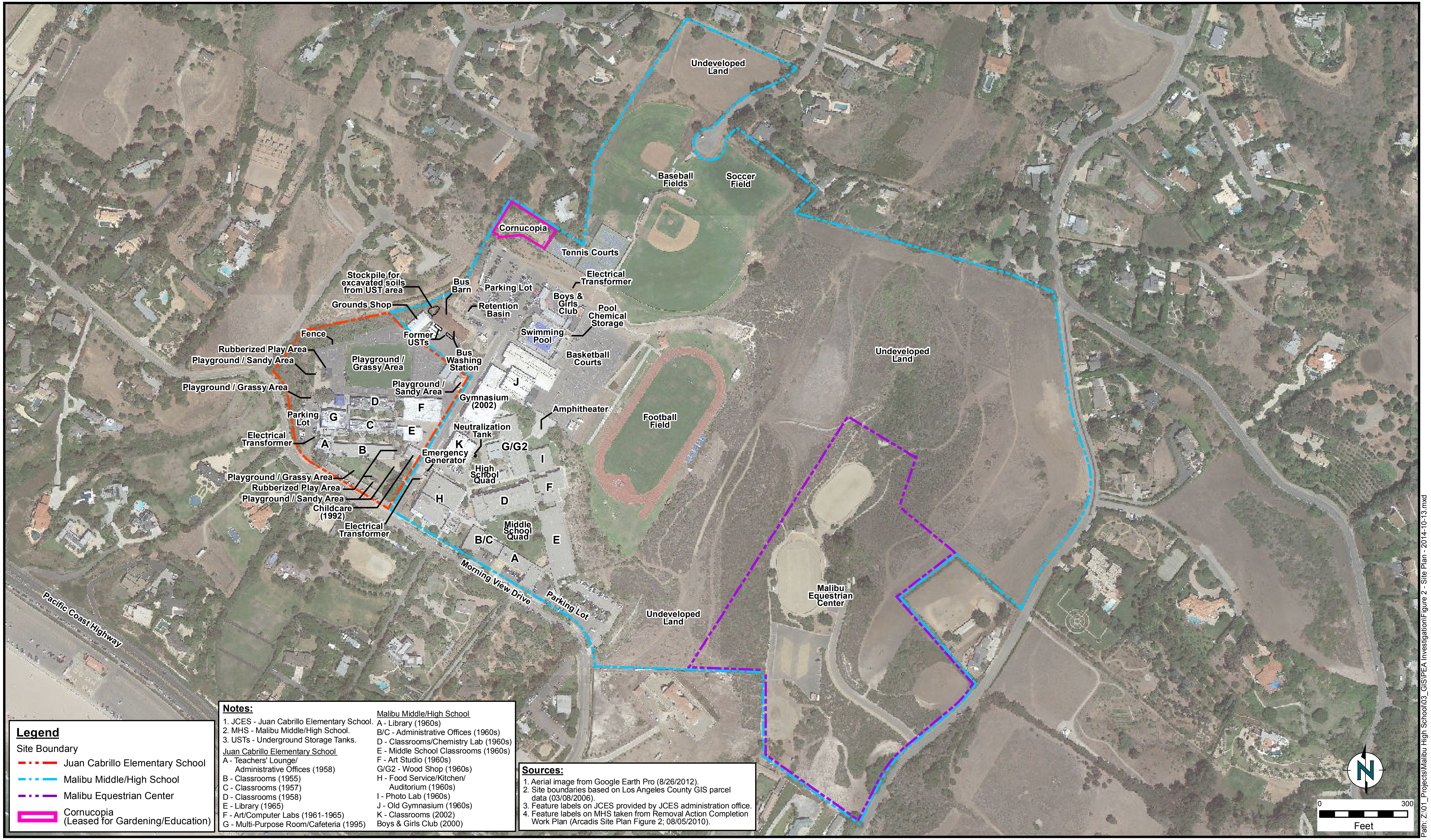
ENVIRON

Site Vicinity Map

30237 and 30215 Morning View Drive
Malibu, California

Figure 1

DRAFTED BY: SShin | Date: 10/13/2014 | PROJECT: 04-33980A



Legend

Site Boundary

- Juan Cabrillo Elementary School
- Malibu Middle/High School
- Malibu Equestrian Center
- Cornucopia (Leased for Gardening/Education)

Notes:

1. JCES - Juan Cabrillo Elementary School.
2. MHS - Malibu Middle/High School.
3. USTs - Underground Storage Tanks.

Juan Cabrillo Elementary School

A - Teachers' Lounge/ Administrative Offices (1958)
B - Classrooms (1955)
C - Classrooms (1957)
D - Classrooms (1958)
E - Library (1965)
F - Art/Computer Labs (1961-1965)
G - Multi-Purpose Room/Cafeteria (1995)

Malibu Middle/High School

A - Library (1960s)
B/C - Administrative Offices (1960s)
D - Classrooms/Chemistry Lab (1960s)
E - Middle School Classrooms (1960s)
F - Art Studio (1960s)
G/G2 - Wood Shop (1960s)
H - Food Service/Kitchen/ Auditorium (1960s)
I - Photo Lab (1960s)
J - Old Gymnasium (1960s)
K - Classrooms (2002)
Boys & Girls Club (2000)

Sources:

1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundaries based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels on JCES provided by JCES administration office.
4. Feature labels on MHS taken from Removal Action Completion Work Plan (Arcadis Site Plan Figure 2; 08/05/2010).

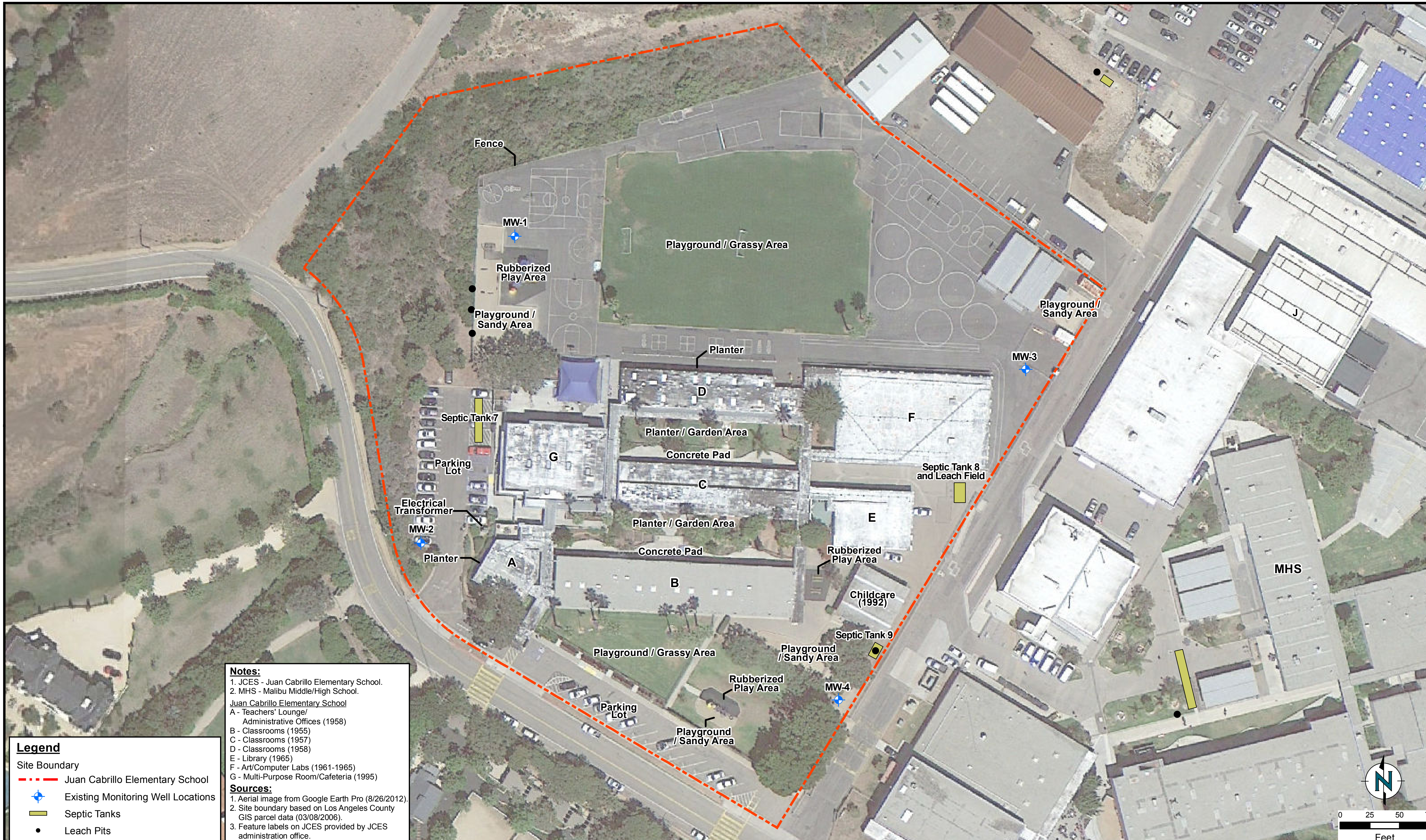
ENVIRON

Site Plan

30237 and 30215 Morning View Drive, Malibu, California

Figure 2

DRAFTED BY: SShin | Date: 10/13/2014 | PROJECT: 04-33980A



ENVIRON

DRAFTED BY: SShin

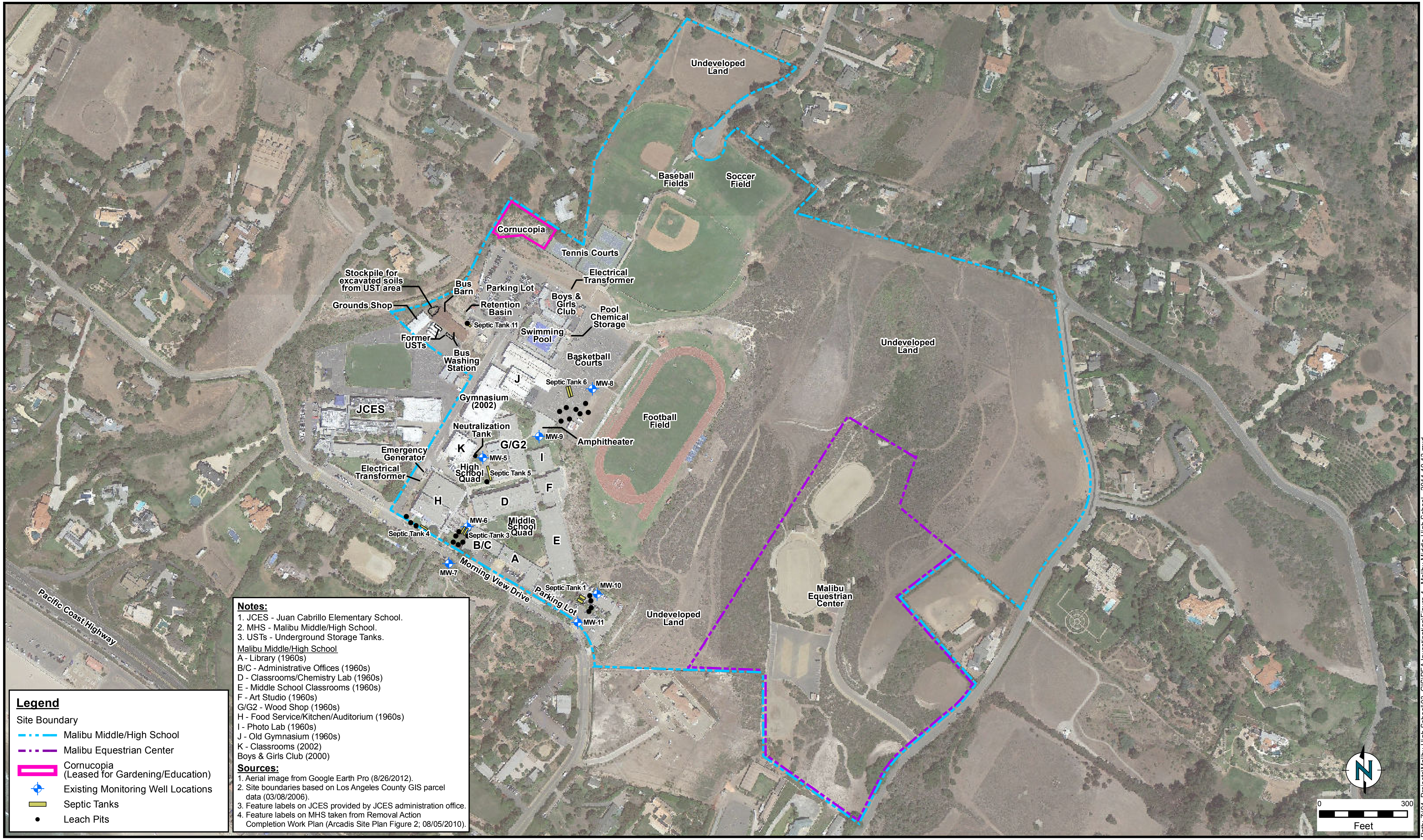
Date: 10/13/2014

Juan Cabrillo Elementary School

30237 Morning View Drive, Malibu, California

Figure 3

PROJECT: 04-33980A



ENVIRON

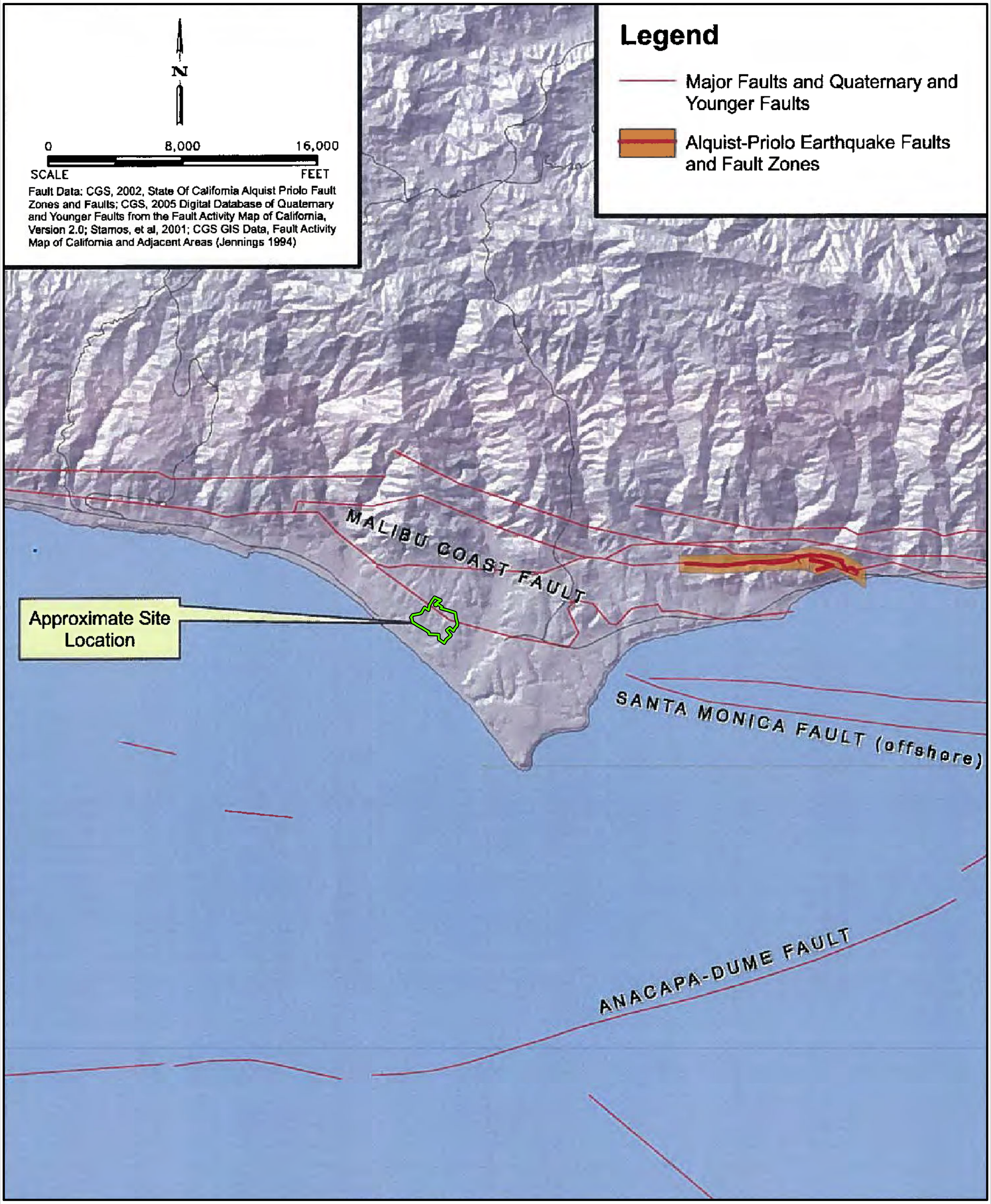
DRAFTED BY: SShin | Date: 10/13/2014

Malibu Middle/High School

30215 Morning View Drive, Malibu, California

Figure 4

PROJECT: 04-33980A



Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 5 - Regional Faulting - 2014-10-13.mxd

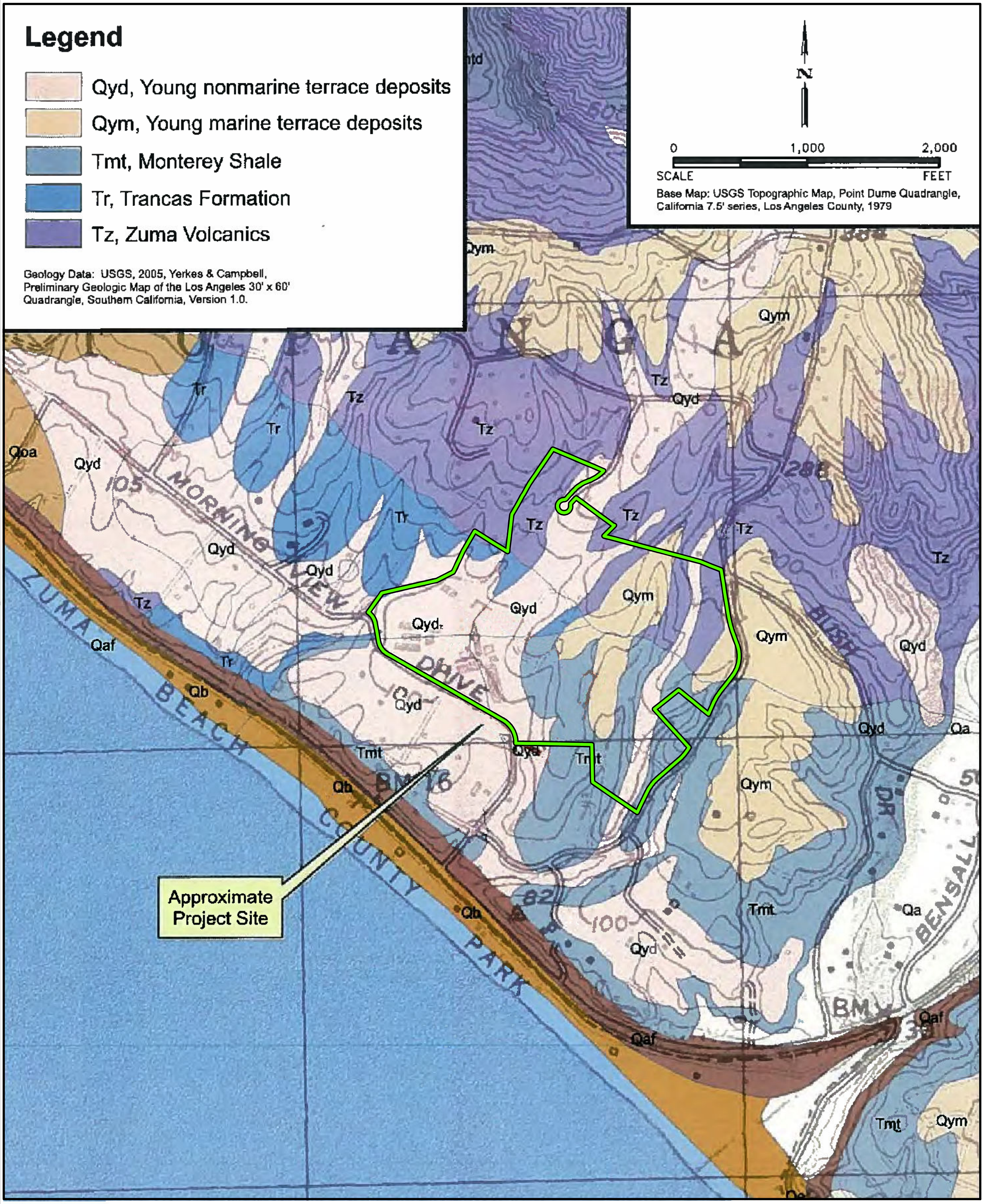
ENVIRON

Regional Faulting

30237 and 30215 Morning View Drive
Malibu, California

Figure
5

DRAFTED BY: SShin | Date: 10/13/2014 | PROJECT: 04-33980A



ENVIRON

Regional Geology

30237 and 30215 Morning View Drive
Malibu, California

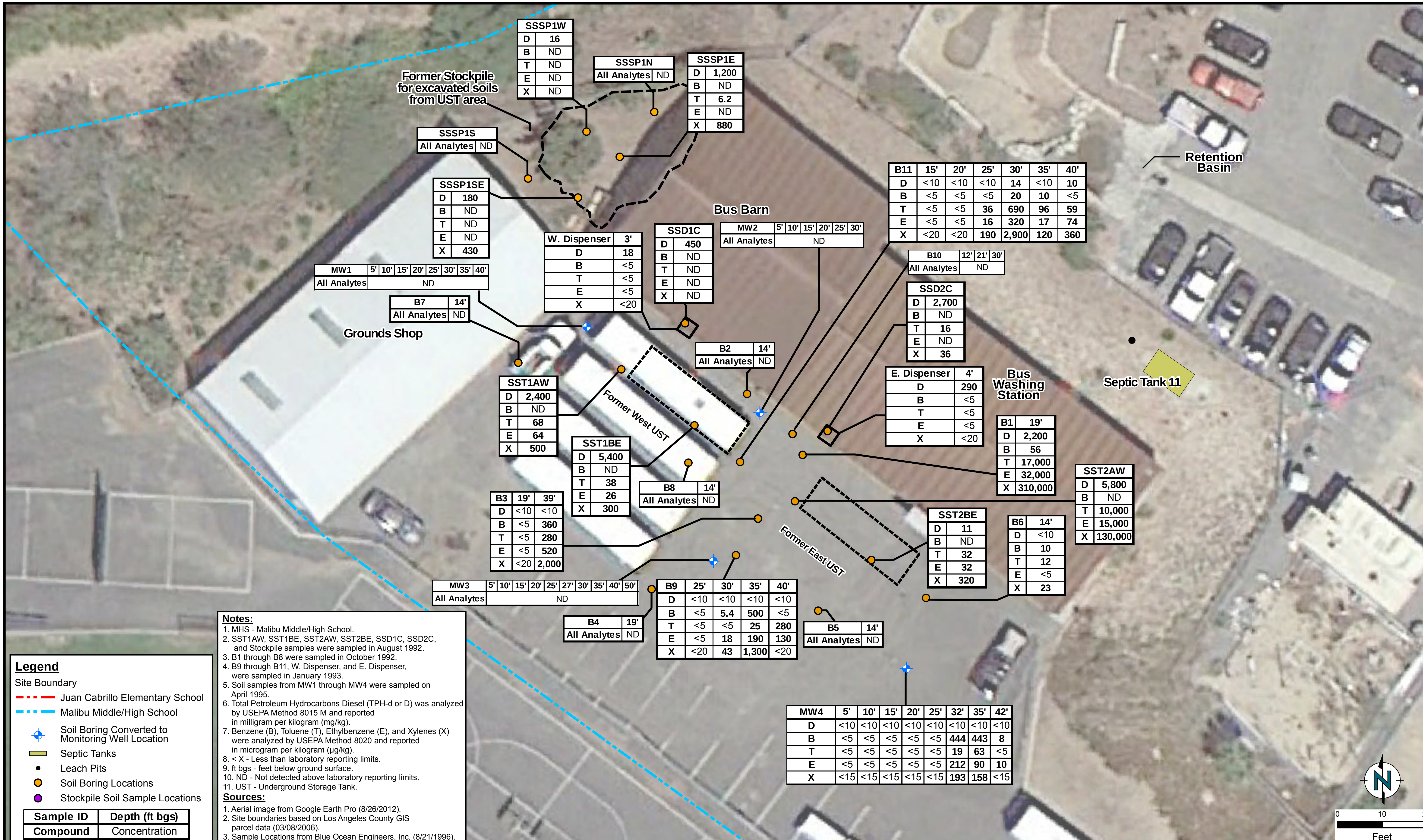
Figure
6

DRAFTED BY: SShin

Date: 10/13/2014

PROJECT: 04-33980A

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 6 - Regional Geology - 2014-10-13.mxd



Notes:

1. MHS - Malibu Middle/High School.
2. SST1AW, SST1BE, SST2AW, SST2BE, SSD1C, SSD2C, and Stockpile samples were sampled in August 1992.
3. B1 through B8 were sampled in October 1992.
4. B9 through B11, W. Dispenser, and E. Dispenser, were sampled in January 1993.
5. Soil samples from MW1 through MW4 were sampled on April 1995.
6. Total Petroleum Hydrocarbons Diesel (TPH-d or D) was analyzed by USEPA Method 8015 M and reported in milligram per kilogram (mg/kg).
7. Benzene (B), Toluene (T), Ethylbenzene (E), and Xylenes (X) were analyzed by USEPA Method 8020 and reported in microgram per kilogram (µg/kg).
8. < X - Less than laboratory reporting limits.
9. ft bgs - feet below ground surface.
10. ND - Not detected above laboratory reporting limits.
11. UST - Underground Storage Tank.

Sources:

1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundaries based on Los Angeles County GIS parcel data (03/08/2006).
3. Sample Locations from Blue Ocean Engineers, Inc. (8/21/1996).

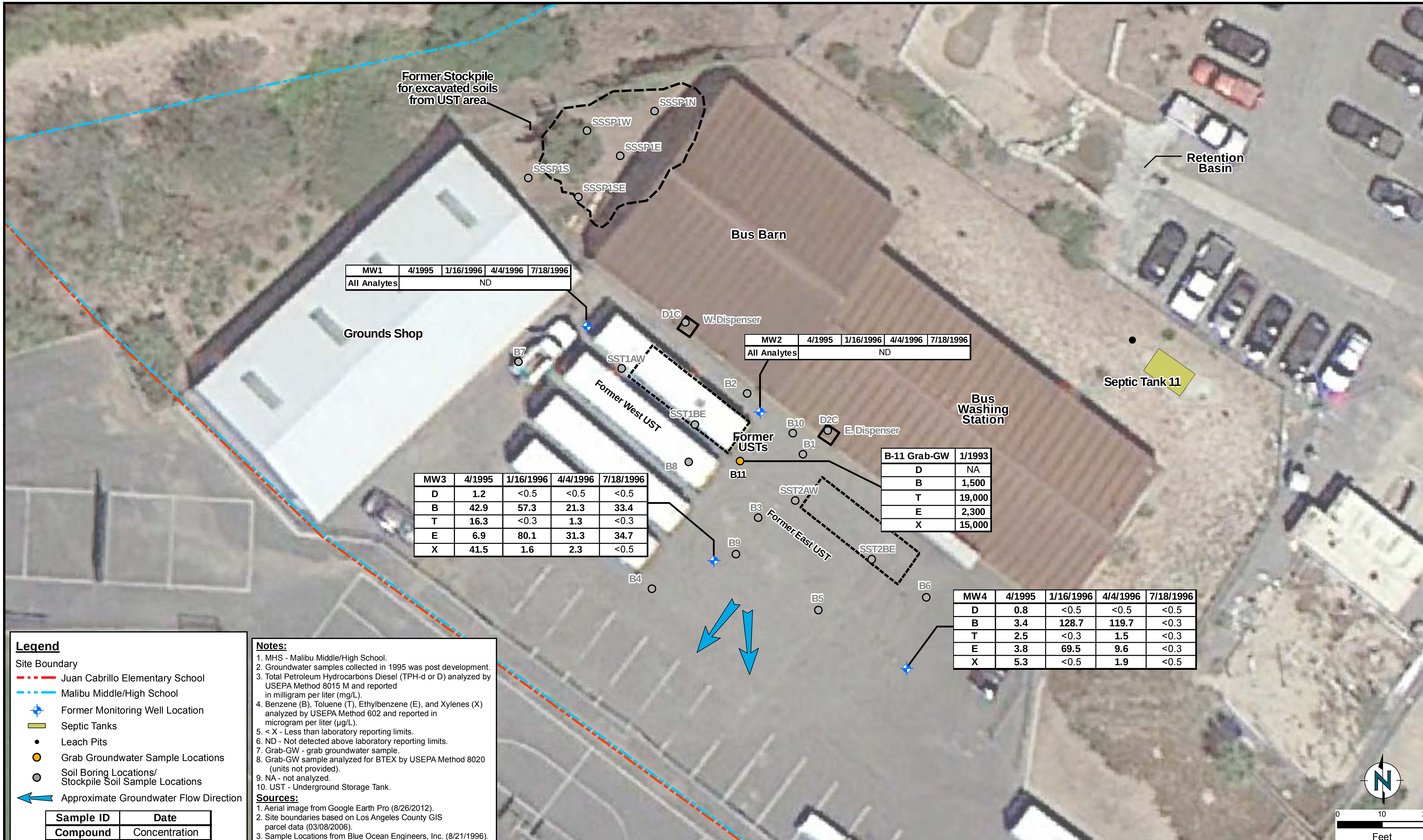
ENVIRON

BTEX and TPH-d in Soil - Former UST Area on MHS

30215 Morning View Drive, Malibu, California

Figure 7

DRAFTED BY: SShin | Date: 10/13/2014 | PROJECT: 04-33980A



MW1	4/1995	1/16/1996	4/4/1996	7/18/1996
All Analytes	ND			

MW2	4/1995	1/16/1996	4/4/1996	7/18/1996
All Analytes	ND			

B-11 Grab-GW	1/1993
D	NA
B	1,500
T	19,000
E	2,300
X	15,000

MW3	4/1995	1/16/1996	4/4/1996	7/18/1996
D	1.2	<0.5	<0.5	<0.5
B	42.9	57.3	21.3	33.4
T	16.3	<0.3	1.3	<0.3
E	6.9	80.1	31.3	34.7
X	41.5	1.6	2.3	<0.5

MW4	4/1995	1/16/1996	4/4/1996	7/18/1996
D	0.8	<0.5	<0.5	<0.5
B	3.4	128.7	119.7	<0.3
T	2.5	<0.3	1.5	<0.3
E	3.8	69.5	9.6	<0.3
X	5.3	<0.5	1.9	<0.5

Legend

Site Boundary
- Juan Cabrillo Elementary School
- Malibu Middle/High School
- Former Monitoring Well Location
- Septic Tanks
- Leach Pits
- Grab Groundwater Sample Locations
- Soil Boring Locations/ Stockpile Soil Sample Locations
- Approximate Groundwater Flow Direction

Sample ID	Date
Compound	Concentration

Notes:
1. MHS - Malibu Middle/High School.
2. Groundwater samples collected in 1995 was post development.
3. Total Petroleum Hydrocarbons Diesel (TPH-d or D) analyzed by USEPA Method 8015 M and reported in milligram per liter (mg/L).
4. Benzene (B), Toluene (T), Ethylbenzene (E), and Xylenes (X) analyzed by USEPA Method 602 and reported in microgram per liter (µg/L).
5. < X - Less than laboratory reporting limits.
6. ND - Not detected above laboratory reporting limits.
7. Grab-GW - grab groundwater sample.
8. Grab-GW sample analyzed for BTEX by USEPA Method 8020 (units not provided).
9. NA - not analyzed.
10. UST - Underground Storage Tank.

Sources:
1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundaries based on Los Angeles County GIS parcel data (03/08/2006).
3. Sample Locations from Blue Ocean Engineers, Inc. (8/21/1996).

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 8 - BTEX and Diesel in Groundwater on MHS - 2014-10-13.mxd

ENVIRON

BTEX and TPH-d in Groundwater - Former UST Area on MHS

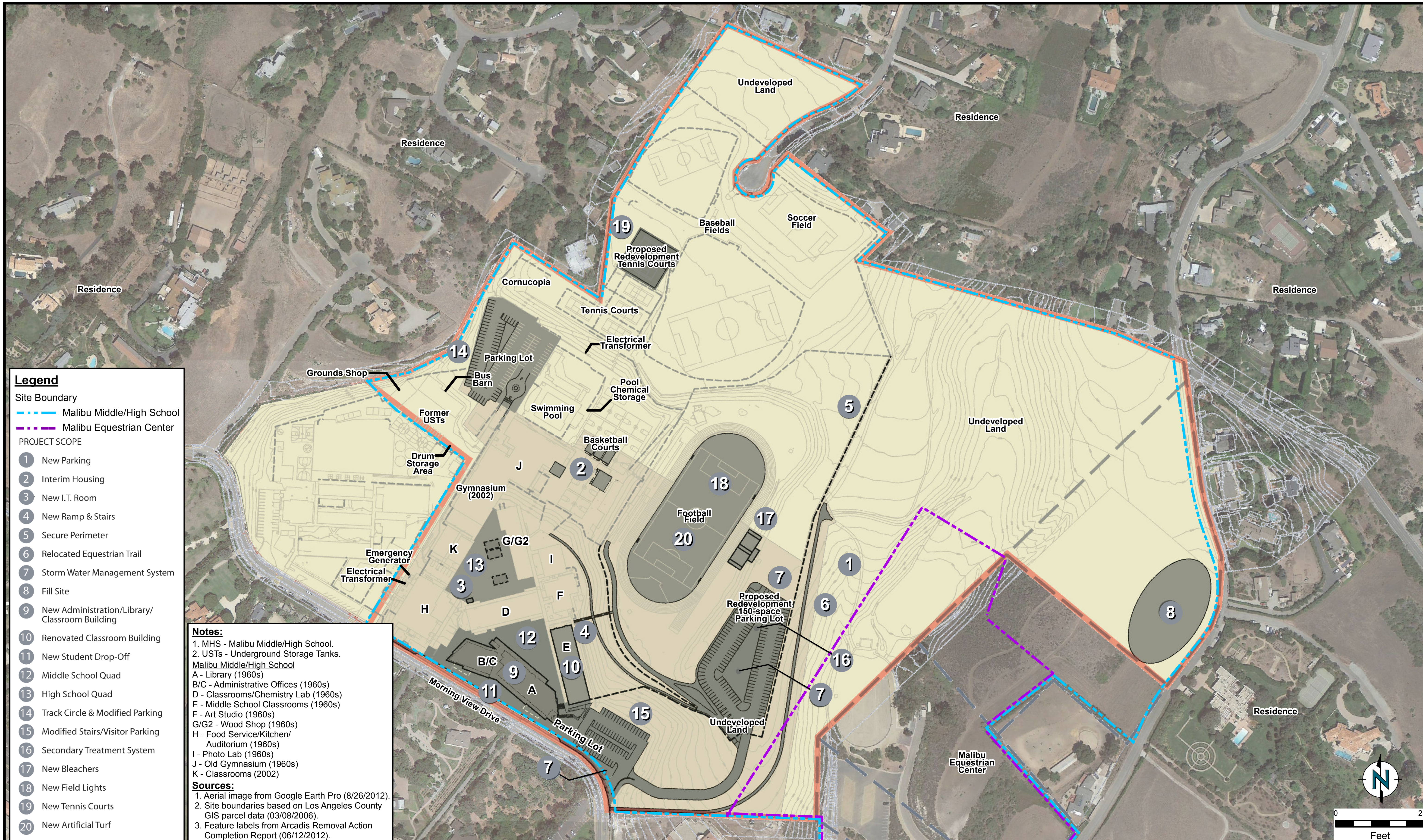
30215 Morning View Drive, Malibu, California

Figure 8

DRAFTED BY: SShin

Date: 10/13/2014

PROJECT: 04-33980A



Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 9 - Planned Redevelopment Areas for MHS - 2014-10-13.mxd

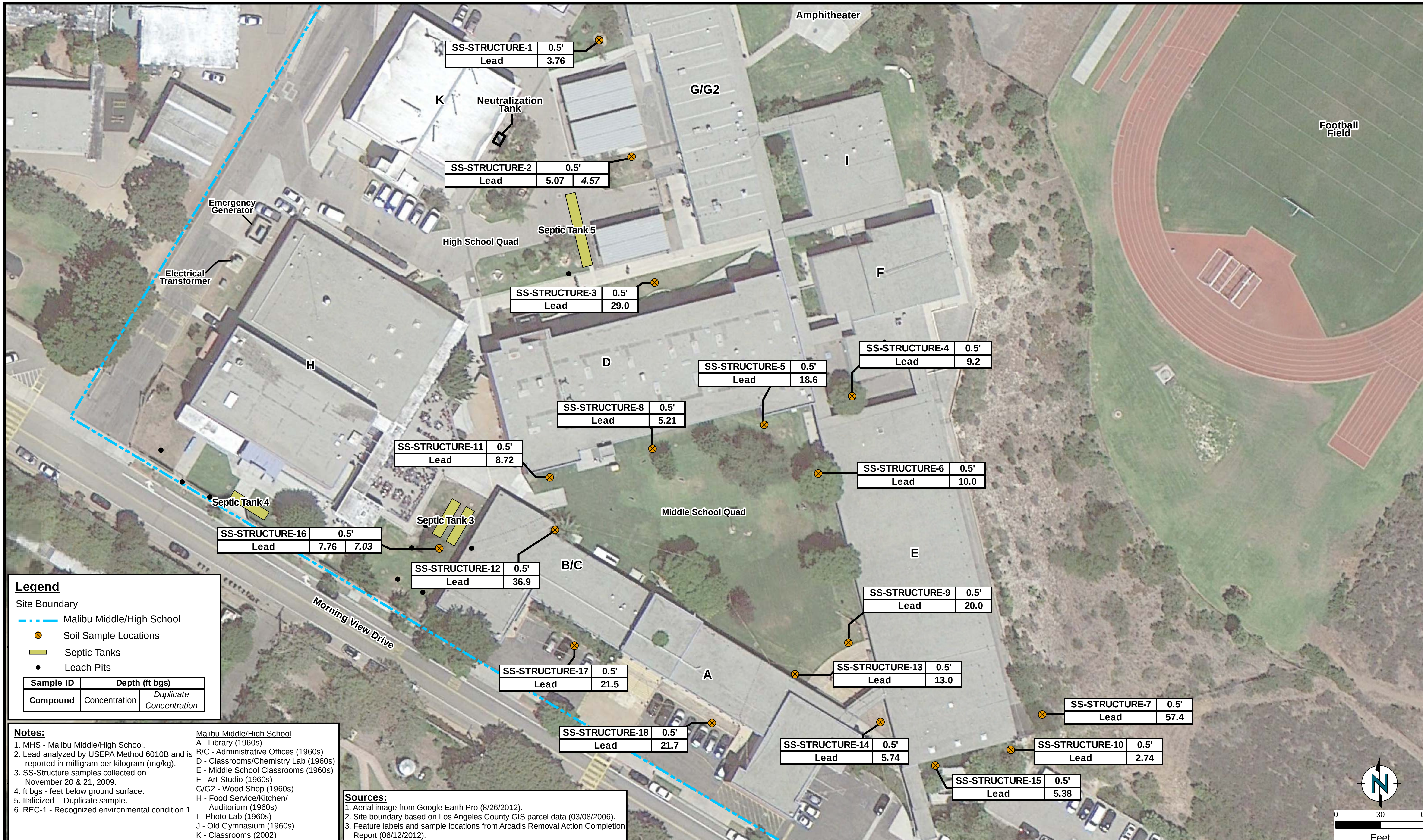
ENVIRON

Planned Redevelopment Areas for MHS

30215 Morning View Drive, Malibu, California

Figure 9

DRAFTED BY: SShin | Date: 10/13/2014 | PROJECT: 04-33980A



Legend

Site Boundary

- Malibu Middle/High School
- Soil Sample Locations
- Septic Tanks
- Leach Pits

Sample ID	Depth (ft bgs)	
Compound	Concentration	*Duplicate Concentration*

Notes:

1. MHS - Malibu Middle/High School.
2. Lead analyzed by USEPA Method 6010B and is reported in milligram per kilogram (mg/kg).
3. SS-Structure samples collected on November 20 & 21, 2009.
4. ft bgs - feet below ground surface.
5. Italicized - Duplicate sample.
6. REC-1 - Recognized environmental condition 1.

Malibu Middle/High School

A - Library (1960s)
B/C - Administrative Offices (1960s)
D - Classrooms/Chemistry Lab (1960s)
E - Middle School Classrooms (1960s)
F - Art Studio (1960s)
G/G2 - Wood Shop (1960s)
H - Food Service/Kitchen/ Auditorium (1960s)
I - Photo Lab (1960s)
J - Old Gymnasium (1960s)
K - Classrooms (2002)

Sources:

1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundary based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 10A - Lead in Soil on MHS - 2014-10-13.mxd

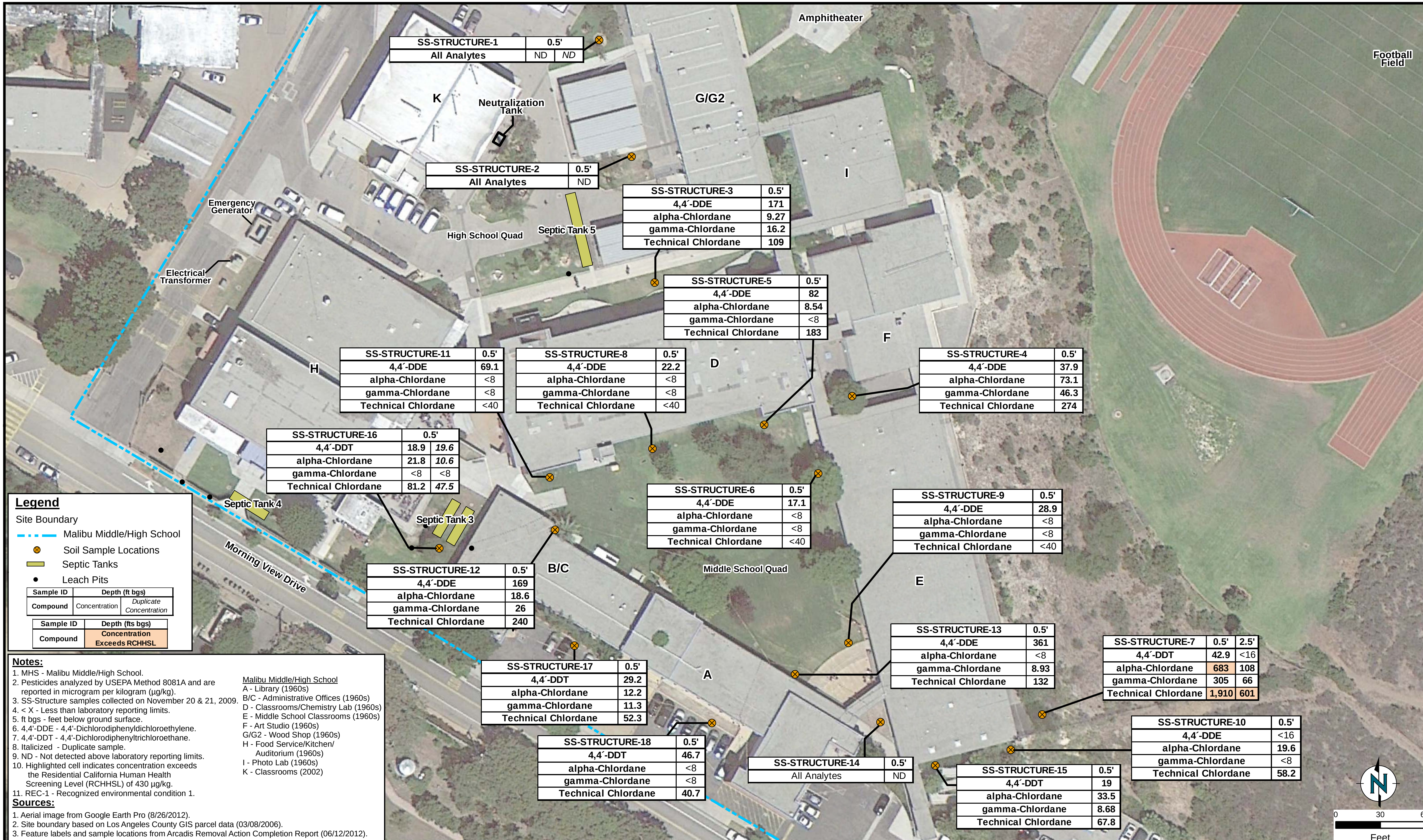
ENVIRON

Lead in Soil on MHS - REC-1

30215 Morning View Drive, Malibu, California

Figure 10A

DRAFTED BY: SShin | Date: 10/13/2014 | PROJECT: 04-33980A



Notes:

1. MHS - Malibu Middle/High School.
2. Pesticides analyzed by USEPA Method 8081A and are reported in microgram per kilogram (µg/kg).
3. SS-Structure samples collected on November 20 & 21, 2009.
4. < X - Less than laboratory reporting limits.
5. ft bgs - feet below ground surface.
6. 4,4'-DDE - 4,4'-Dichlorodiphenyldichloroethylene.
7. 4,4'-DDT - 4,4'-Dichlorodiphenyltrichloroethane.
8. Italicized - Duplicate sample.
9. ND - Not detected above laboratory reporting limits.
10. Highlighted cell indicates concentration exceeds the Residential California Human Health Screening Level (RCHHSL) of 430 µg/kg.
11. REC-1 - Recognized environmental condition 1.

Malibu Middle/High School
A - Library (1960s)
B/C - Administrative Offices (1960s)
D - Classrooms/Chemistry Lab (1960s)
E - Middle School Classrooms (1960s)
F - Art Studio (1960s)
G/G2 - Wood Shop (1960s)
H - Food Service/Kitchen/ Auditorium (1960s)
I - Photo Lab (1960s)
K - Classrooms (2002)

Sources:

1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundary based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

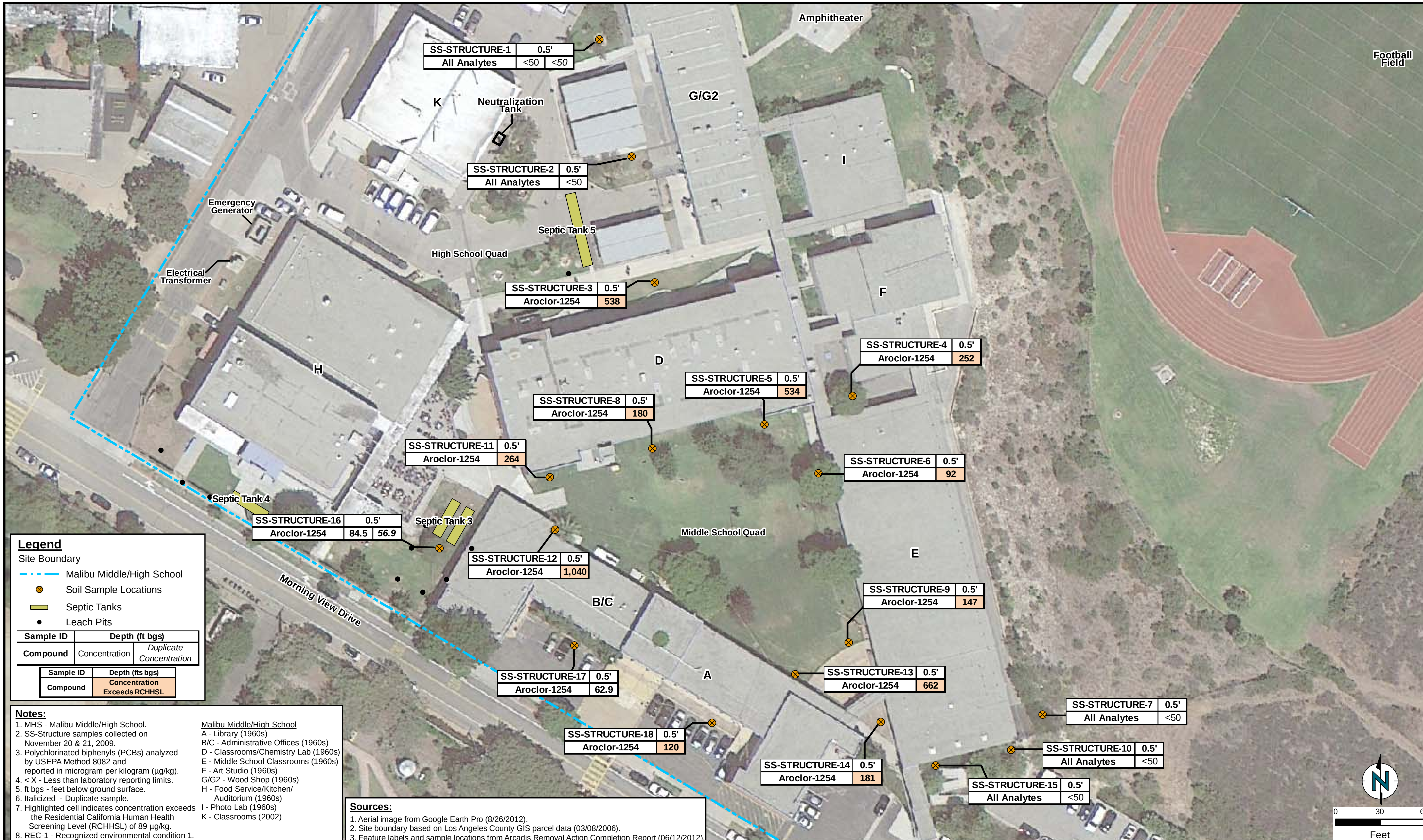
ENVIRON

Pesticides in Soil on MHS - REC-1

30215 Morning View Drive, Malibu, California

Figure 10B

DRAFTED BY: SShin | Date: 10/13/2014 | PROJECT: 04-33980A



Legend

Site Boundary

- Malibu Middle/High School
- Soil Sample Locations
- Septic Tanks
- Leach Pits

Sample ID	Depth (ft bgs)	
Compound	Concentration	*Duplicate Concentration*

Sample ID	Depth (fts bgs)
Compound	Concentration Exceeds RCHHSL

Notes:

1. MHS - Malibu Middle/High School.
2. SS-Structure samples collected on November 20 & 21, 2009.
3. Polychlorinated biphenyls (PCBs) analyzed by USEPA Method 8082 and reported in microgram per kilogram (µg/kg).
4. < X - Less than laboratory reporting limits.
5. ft bgs - feet below ground surface.
6. Italicized - Duplicate sample.
7. Highlighted cell indicates concentration exceeds the Residential California Human Health Screening Level (RCHHSL) of 89 µg/kg.
8. REC-1 - Recognized environmental condition 1.

Malibu Middle/High School
A - Library (1960s)
B/C - Administrative Offices (1960s)
D - Classrooms/Chemistry Lab (1960s)
E - Middle School Classrooms (1960s)
F - Art Studio (1960s)
G/G2 - Wood Shop (1960s)
H - Food Service/Kitchen/ Auditorium (1960s)
I - Photo Lab (1960s)
K - Classrooms (2002)

Sources:

1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundary based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 10C - PCBs in Soil on MHS - 2014-10-13.mxd

ENVIRON

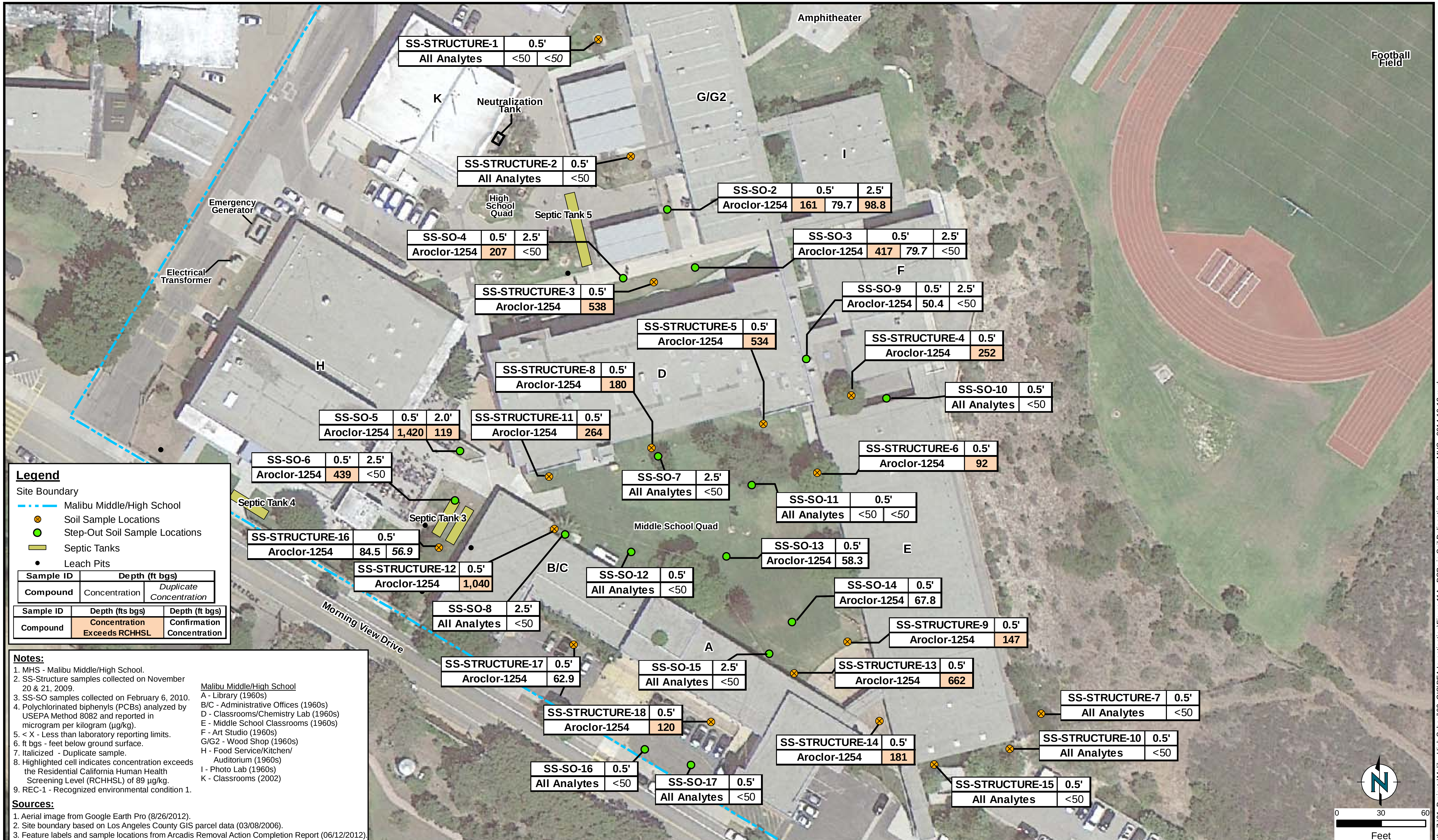
DRAFTED BY: SShin | Date: 10/13/2014

PCBs in Soil on MHS - REC-1

30215 Morning View Drive, Malibu, California

Figure 10C

PROJECT: 04-33980A



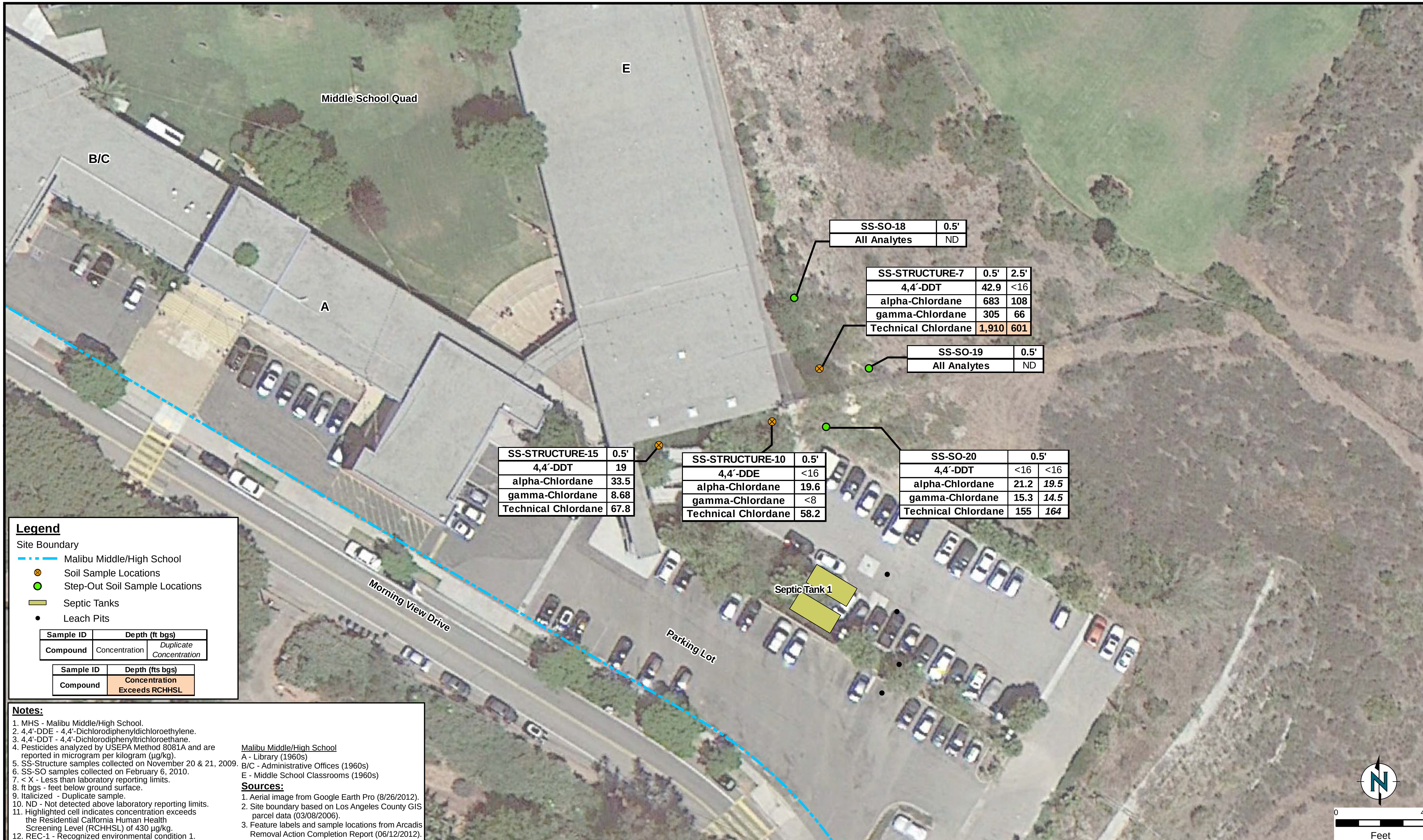
ENVIRON

PCBs in Soil Step-Out Samples on MHS - REC-1

30215 Morning View Drive, Malibu, California

Figure 11A

DRAFTED BY: SShin | Date: 10/13/2014 | PROJECT: 04-33980A



SS-SO-18	0.5'
All Analytes	ND

SS-STRUCTURE-7	0.5'	2.5'
4,4´-DDT	42.9	<16
alpha-Chlordane	683	108
gamma-Chlordane	305	66
Technical Chlordane	1,910	601

SS-SO-19	0.5'
All Analytes	ND

SS-STRUCTURE-15	0.5'
4,4´-DDT	19
alpha-Chlordane	33.5
gamma-Chlordane	8.68
Technical Chlordane	67.8

SS-STRUCTURE-10	0.5'
4,4´-DDE	<16
alpha-Chlordane	19.6
gamma-Chlordane	<8
Technical Chlordane	58.2

SS-SO-20	0.5'	
4,4´-DDT	<16	*<16*
alpha-Chlordane	21.2	*19.5*
gamma-Chlordane	15.3	*14.5*
Technical Chlordane	155	*164*

Legend

Site Boundary

Malibu Middle/High School

Soil Sample Locations

Step-Out Soil Sample Locations

Septic Tanks

Leach Pits

Sample ID	Depth (ft bgs)	
Compound	Concentration	*Duplicate Concentration*

Sample ID	Depth (fts bgs)
Compound	Concentration Exceeds RCHHSL

Notes:

1. MHS - Malibu Middle/High School.
2. 4,4'-DDE - 4,4'-Dichlorodiphenyldichloroethylene.
3. 4,4'-DDT - 4,4'-Dichlorodiphenyltrichloroethane.
4. Pesticides analyzed by USEPA Method 8081A and are reported in microgram per kilogram (µg/kg).
5. SS-Structure samples collected on November 20 & 21, 2009.
6. SS-SO samples collected on February 6, 2010.
7. < X - Less than laboratory reporting limits.
8. ft bgs - feet below ground surface.
9. Italicized - Duplicate sample.
10. ND - Not detected above laboratory reporting limits.
11. Highlighted cell indicates concentration exceeds the Residential Calfornia Human Health Screening Level (RCHHSL) of 430 µg/kg.
12. REC-1 - Recognized environmental condition 1.

Malibu Middle/High School

A - Library (1960s)

B/C - Administrative Offices (1960s)

E - Middle School Classrooms (1960s)

Sources:

1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundary based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 11B - Pesticides in Soil Delineation Samples on MHS - 2014-10-13.mxd

ENVIRON

Pesticides in Soil Step-Out Samples on MHS - REC-1

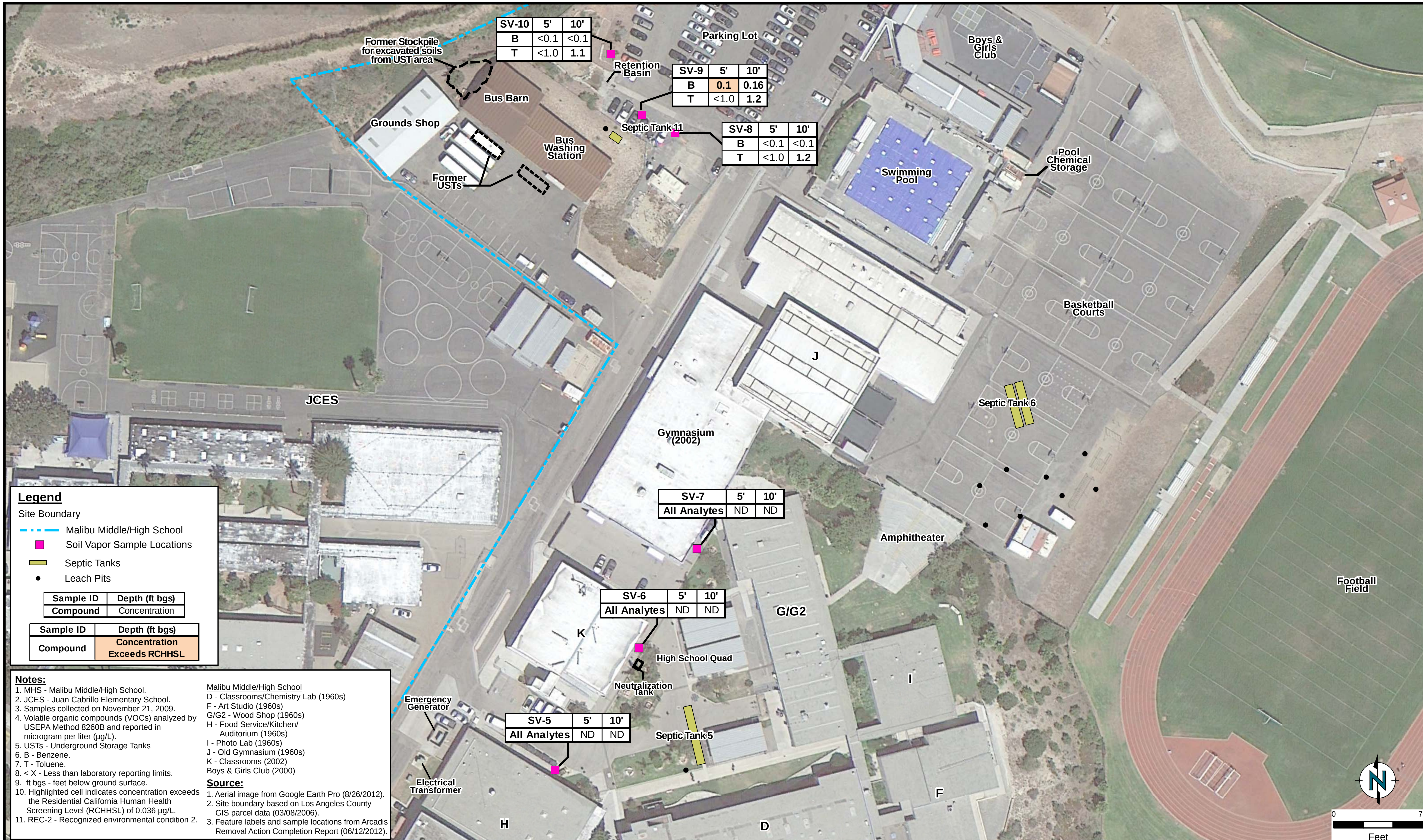
30215 Morning View Drive, Malibu, California

Figure 11B

DRAFTED BY: SShin

Date: 10/13/2014

PROJECT: 04-33980A



Legend

Site Boundary

Malibu Middle/High School

Soil Vapor Sample Locations

Septic Tanks

Leach Pits

Sample ID	Depth (ft bgs)
Compound	Concentration

Sample ID	Depth (ft bgs)
Compound	Concentration Exceeds RCHHSL

Notes:

1. MHS - Malibu Middle/High School.
2. JCES - Juan Cabrillo Elementary School.
3. Samples collected on November 21, 2009.
4. Volatile organic compounds (VOCs) analyzed by USEPA Method 8260B and reported in microgram per liter (µg/L).
5. USTs - Underground Storage Tanks
6. B - Benzene.
7. T - Toluene.
8. < X - Less than laboratory reporting limits.
9. ft bgs - feet below ground surface.
10. Highlighted cell indicates concentration exceeds the Residential California Human Health Screening Level (RCHHSL) of 0.036 µg/L.
11. REC-2 - Recognized environmental condition 2.

Malibu Middle/High School

D - Classrooms/Chemistry Lab (1960s)
F - Art Studio (1960s)
G/G2 - Wood Shop (1960s)
H - Food Service/Kitchen/ Auditorium (1960s)
I - Photo Lab (1960s)
J - Old Gymnasium (1960s)
K - Classrooms (2002)
Boys & Girls Club (2000)

Source:

1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundary based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 12 - VOCs in Soil Vapor on MHS (SV-8 through SV-10) - 2014-10-13.mxd

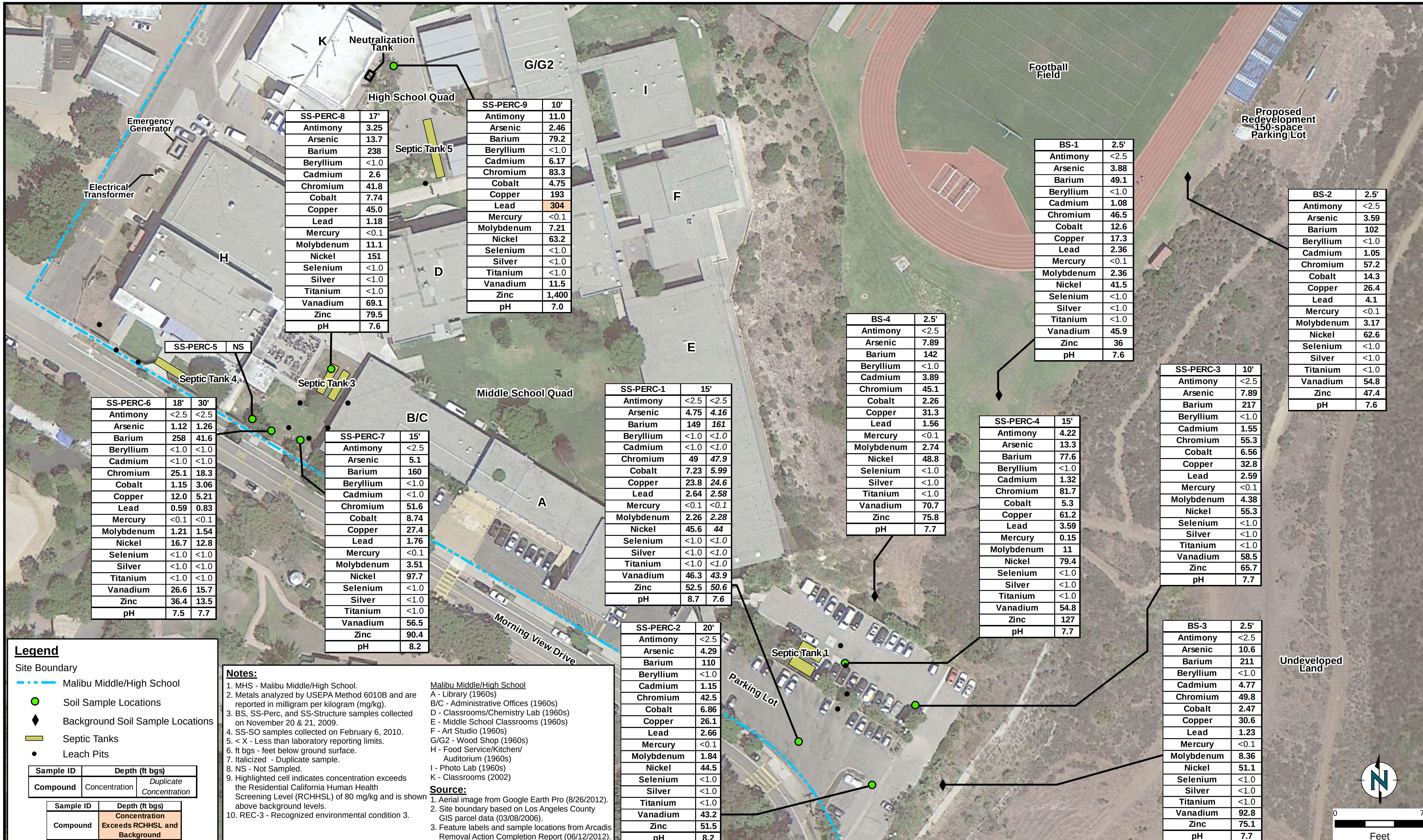
ENVIRON

VOCs in Soil Vapor on MHS (SV-5 through SV-10) - REC-2

30215 Morning View Drive, Malibu, California

Figure 12

DRAFTED BY: SShin | Date: 10/13/2014 | PROJECT: 04-33980A



SS-PERC-8	17'
Antimony	3.25
Arsenic	13.7
Barium	238
Beryllium	<1.0
Cadmium	2.6
Chromium	41.8
Cobalt	7.74
Copper	45.0
Lead	1.18
Mercury	<0.1
Molybdenum	11.1
Nickel	151
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	69.1
Zinc	79.5
pH	7.6

SS-PERC-9	10'
Antimony	11.0
Arsenic	2.46
Barium	79.2
Beryllium	<1.0
Cadmium	6.17
Chromium	83.3
Cobalt	4.75
Copper	193
Lead	304
Mercury	<0.1
Molybdenum	7.21
Nickel	63.2
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	11.5
Zinc	1,400
pH	7.0

BS-1	2.5'
Antimony	<2.5
Arsenic	3.88
Barium	49.1
Beryllium	<1.0
Cadmium	1.08
Chromium	46.5
Cobalt	12.6
Copper	17.3
Lead	2.36
Mercury	<0.1
Molybdenum	2.36
Nickel	41.5
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	45.9
Zinc	36
pH	7.6

BS-2	2.5'
Antimony	<2.5
Arsenic	3.59
Barium	102
Beryllium	<1.0
Cadmium	1.05
Chromium	57.2
Cobalt	14.3
Copper	26.4
Lead	4.1
Mercury	<0.1
Molybdenum	3.17
Nickel	62.6
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	54.8
Zinc	47.4
pH	7.6

BS-4	2.5'
Antimony	<2.5
Arsenic	7.89
Barium	142
Beryllium	<1.0
Cadmium	3.89
Chromium	45.1
Cobalt	2.26
Copper	31.3
Lead	1.56
Mercury	<0.1
Molybdenum	2.74
Nickel	48.8
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	70.7
Zinc	75.8
pH	7.7

SS-PERC-3	10'
Antimony	<2.5
Arsenic	7.89
Barium	217
Beryllium	<1.0
Cadmium	1.55
Chromium	55.3
Cobalt	6.56
Copper	32.8
Lead	2.59
Mercury	<0.1
Molybdenum	4.38
Nickel	55.3
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	58.5
Zinc	65.7
pH	7.7

SS-PERC-5	NS

SS-PERC-6	18'	30'
Antimony	<2.5	<2.5
Arsenic	1.12	1.26
Barium	258	41.6
Beryllium	<1.0	<1.0
Cadmium	<1.0	<1.0
Chromium	25.1	18.3
Cobalt	1.15	3.06
Copper	12.0	5.21
Lead	0.59	0.83
Mercury	<0.1	<0.1
Molybdenum	1.21	1.54
Nickel	16.7	12.8
Selenium	<1.0	<1.0
Silver	<1.0	<1.0
Titanium	<1.0	<1.0
Vanadium	26.6	15.7
Zinc	36.4	13.5
pH	7.5	7.7

SS-PERC-7	15'
Antimony	<2.5
Arsenic	5.1
Barium	160
Beryllium	<1.0
Cadmium	<1.0
Chromium	51.6
Cobalt	8.74
Copper	27.4
Lead	1.76
Mercury	<0.1
Molybdenum	3.51
Nickel	97.7
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	56.5
Zinc	90.4
pH	8.2

SS-PERC-1	15'	
Antimony	<2.5	*<2.5*
Arsenic	4.75	*4.16*
Barium	149	*161*
Beryllium	<1.0	*<1.0*
Cadmium	<1.0	*<1.0*
Chromium	49	*47.9*
Cobalt	7.23	*5.99*
Copper	23.8	*24.6*
Lead	2.64	*2.58*
Mercury	<0.1	*<0.1*
Molybdenum	2.26	*2.28*
Nickel	45.6	*44*
Selenium	<1.0	*<1.0*
Silver	<1.0	*<1.0*
Titanium	<1.0	*<1.0*
Vanadium	46.3	*43.9*
Zinc	52.5	*50.6*
pH	8.7	*7.6*

SS-PERC-4	15'
Antimony	4.22
Arsenic	13.3
Barium	77.6
Beryllium	<1.0
Cadmium	1.32
Chromium	81.7
Cobalt	5.3
Copper	61.2
Lead	3.59
Mercury	0.15
Molybdenum	11
Nickel	79.4
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	54.8
Zinc	127
pH	7.7

SS-PERC-2	20'
Antimony	<2.5
Arsenic	4.29
Barium	110
Beryllium	<1.0
Cadmium	1.15
Chromium	42.5
Cobalt	6.86
Copper	26.1
Lead	2.66
Mercury	<0.1
Molybdenum	1.84
Nickel	44.5
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	43.2
Zinc	51.5
pH	8.2

BS-3	2.5'
Antimony	<2.5
Arsenic	10.6
Barium	211
Beryllium	<1.0
Cadmium	4.77
Chromium	49.8
Cobalt	2.47
Copper	30.6
Lead	1.23
Mercury	<0.1
Molybdenum	8.36
Nickel	51.1
Selenium	<1.0
Silver	<1.0
Titanium	<1.0
Vanadium	92.8
Zinc	75.1
pH	7.7

Legend

Site Boundary
- Malibu Middle/High School
- Soil Sample Locations
- Background Soil Sample Locations
- Septic Tanks
- Leach Pits

Sample ID	Depth (ft bgs)	
Compound	Concentration	*Duplicate Concentration*

Sample ID	Depth (ft bgs)
Compound	Concentration Exceeds RCHHSL and Background

Notes:
1. MHS - Malibu Middle/High School.
2. Metals analyzed by USEPA Method 6010B and are reported in milligram per kilogram (mg/kg).
3. BS, SS-Perc, and SS-Structure samples collected on November 20 & 21, 2009.
4. SS-SO samples collected on February 6, 2010.
5. < X - Less than laboratory reporting limits.
6. ft bgs - feet below ground surface.
7. Italicized - Duplicate sample.
8. NS - Not Sampled.
9. Highlighted cell indicates concentration exceeds the Residential California Human Health Screening Level (RCHHSL) of 80 mg/kg and is shown above background levels.
10. REC-3 - Recognized environmental condition 3.

Malibu Middle/High School
A - Library (1960s)
B/C - Administrative Offices (1960s)
D - Classrooms/Chemistry Lab (1960s)
E - Middle School Classrooms (1960s)
F - Art Studio (1960s)
G/G2 - Wood Shop (1960s)
H - Food Service/Kitchen/ Auditorium (1960s)
I - Photo Lab (1960s)
K - Classrooms (2002)

Source:
1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundary based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 13A - Metals and pH in Soil on MHS - 2014-10-13.mxd

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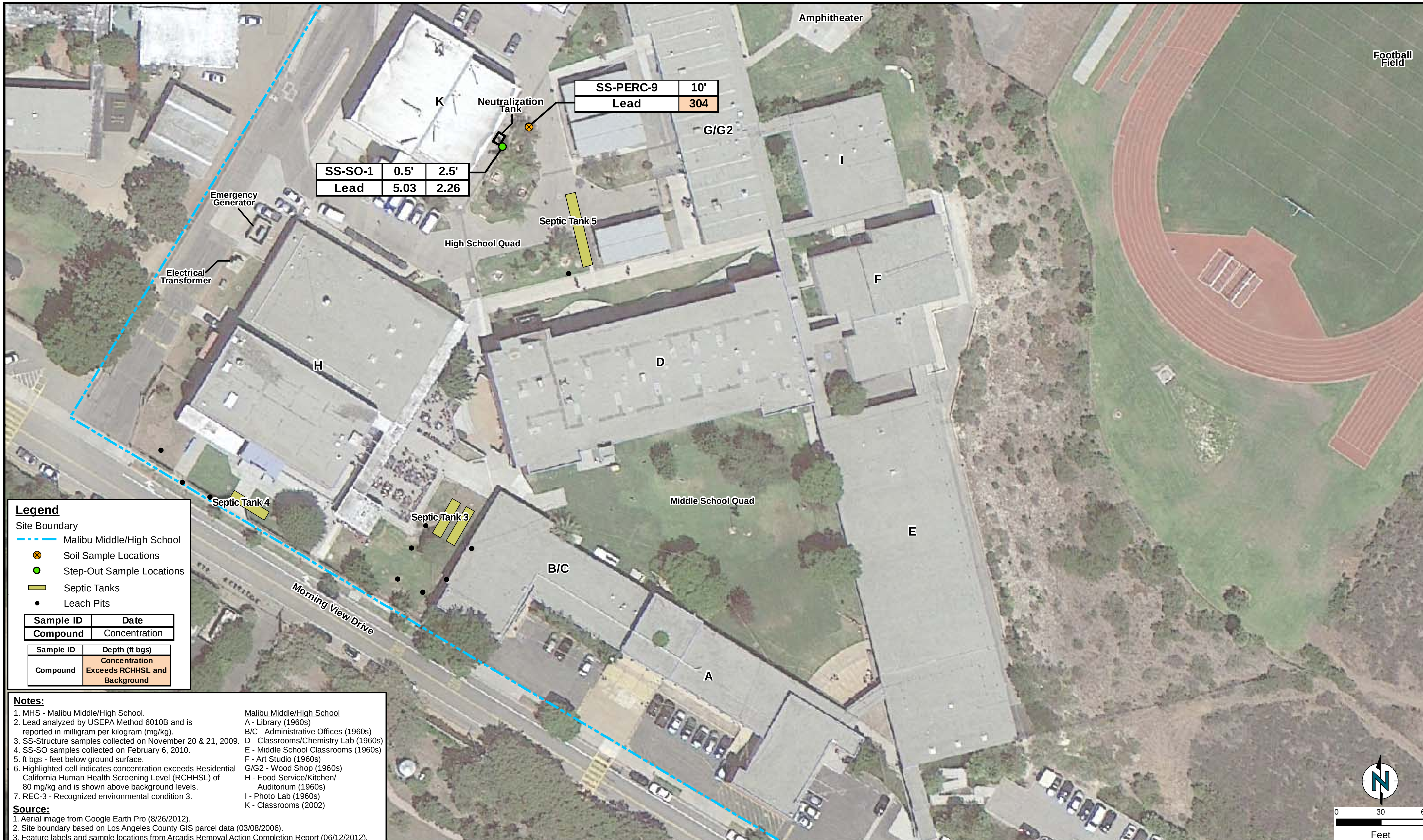
Metals and pH in Soil on MHS - REC-3

30215 Morning View Drive, Malibu, California

Figure 13A

PROJECT: 04-33980A



Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 13B - Lead in Soil Delineation Samples on MHS - 2014-10-13.mxd

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Lead in Soil Step-Out Samples on MHS - REC-3

30215 Morning View Drive, Malibu, California

Figure 13B

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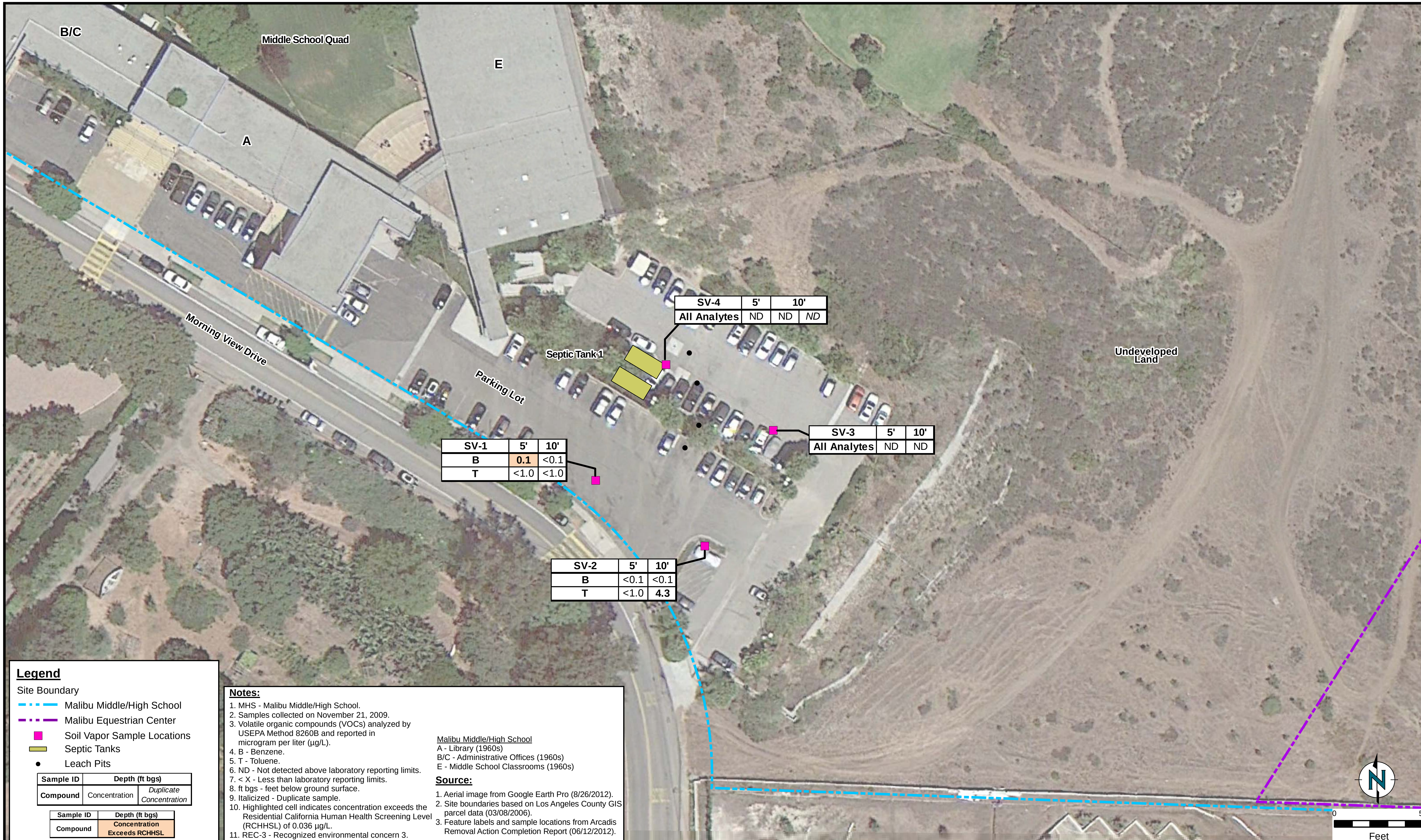


SV-4	5'	10'	
All Analytes	ND	ND	*ND*

SV-3	5'	10'
All Analytes	ND	ND

SV-1	5'	10'
B	0.1	<0.1
T	<1.0	<1.0

SV-2	5'	10'
B	<0.1	<0.1
T	<1.0	**4.3**

Legend

Site Boundary
- Malibu Middle/High School
- Malibu Equestrian Center
- Soil Vapor Sample Locations
- Septic Tanks
- Leach Pits

Sample ID	Depth (ft bgs)	
Compound	Concentration	*Duplicate Concentration*

Sample ID	Depth (ft bgs)
Compound	Concentration Exceeds RCHHSL

Notes:
1. MHS - Malibu Middle/High School.
2. Samples collected on November 21, 2009.
3. Volatile organic compounds (VOCs) analyzed by USEPA Method 8260B and reported in microgram per liter (µg/L).
4. B - Benzene.
5. T - Toluene.
6. ND - Not detected above laboratory reporting limits.
7. < X - Less than laboratory reporting limits.
8. ft bgs - feet below ground surface.
9. Italicized - Duplicate sample.
10. Highlighted cell indicates concentration exceeds the Residential California Human Health Screening Level (RCHHSL) of 0.036 µg/L.
11. REC-3 - Recognized environmental concern 3.

Malibu Middle/High School
A - Library (1960s)
B/C - Administrative Offices (1960s)
E - Middle School Classrooms (1960s)

Source:
1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundaries based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 14 - VOCs in Soil Vapor on MHS (SV-1 through SV-7) - 2014-10-13.mxd

ENVIRON

VOCs in Soil Vapor on MHS (SV-1 through SV-4) - REC-3

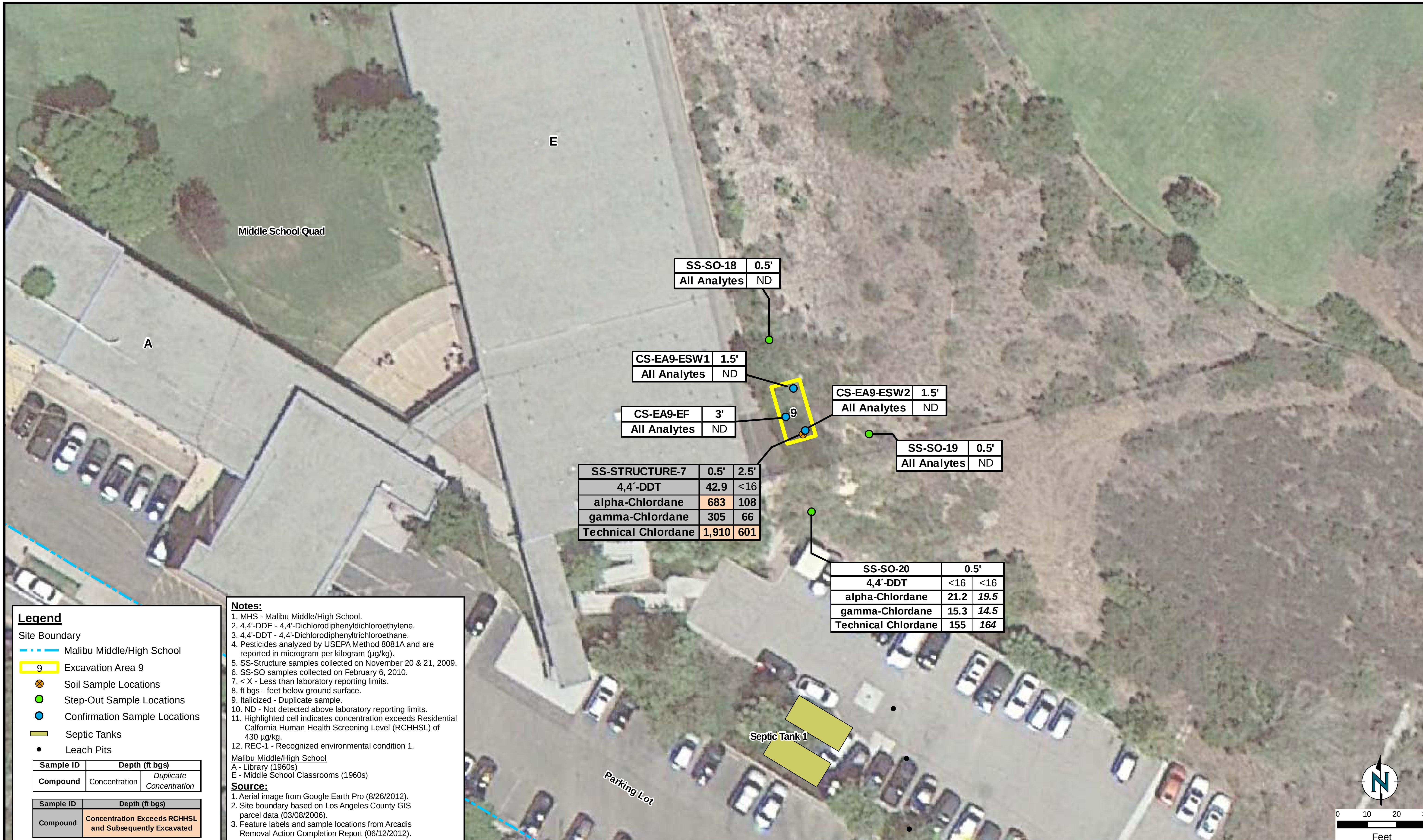
30215 Morning View Drive, Malibu, California

Figure 14

DRAFTED BY: SShin

Date: 10/13/2014

PROJECT: 04-33980A



SS-SO-18	0.5'
All Analytes	ND

CS-EA9-ESW1	1.5'
All Analytes	ND

CS-EA9-ESW2	1.5'
All Analytes	ND

CS-EA9-EF	3'
All Analytes	ND

SS-SO-19	0.5'
All Analytes	ND

SS-STRUCTURE-7	0.5'	2.5'
4,4´-DDT	42.9	<16
alpha-Chlordane	683	108
gamma-Chlordane	305	66
Technical Chlordane	1,910	601

SS-SO-20	0.5'	
4,4´-DDT	<16	<16
alpha-Chlordane	21.2	*19.5*
gamma-Chlordane	15.3	*14.5*
Technical Chlordane	155	*164*

Legend

Site Boundary
- Malibu Middle/High School
- 9 Excavation Area 9
- Soil Sample Locations
- Step-Out Sample Locations
- Confirmation Sample Locations
- Septic Tanks
- Leach Pits

Sample ID	Depth (ft bgs)	
Compound	Concentration	*Duplicate Concentration*

Sample ID	Depth (ft bgs)
Compound	Concentration Exceeds RCHHSL and Subsequently Excavated

Notes:
1. MHS - Malibu Middle/High School.
2. 4,4'-DDE - 4,4'-Dichlorodiphenyldichloroethylene.
3. 4,4'-DDT - 4,4'-Dichlorodiphenyltrichloroethane.
4. Pesticides analyzed by USEPA Method 8081A and are reported in microgram per kilogram (µg/kg).
5. SS-Structure samples collected on November 20 & 21, 2009.
6. SS-SO samples collected on February 6, 2010.
7. < X - Less than laboratory reporting limits.
8. ft bgs - feet below ground surface.
9. Italicized - Duplicate sample.
10. ND - Not detected above laboratory reporting limits.
11. Highlighted cell indicates concentration exceeds Residential California Human Health Screening Level (RCHHSL) of 430 µg/kg.
12. REC-1 - Recognized environmental condition 1.

Malibu Middle/High School
A - Library (1960s)
E - Middle School Classrooms (1960s)

Source:
1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundary based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

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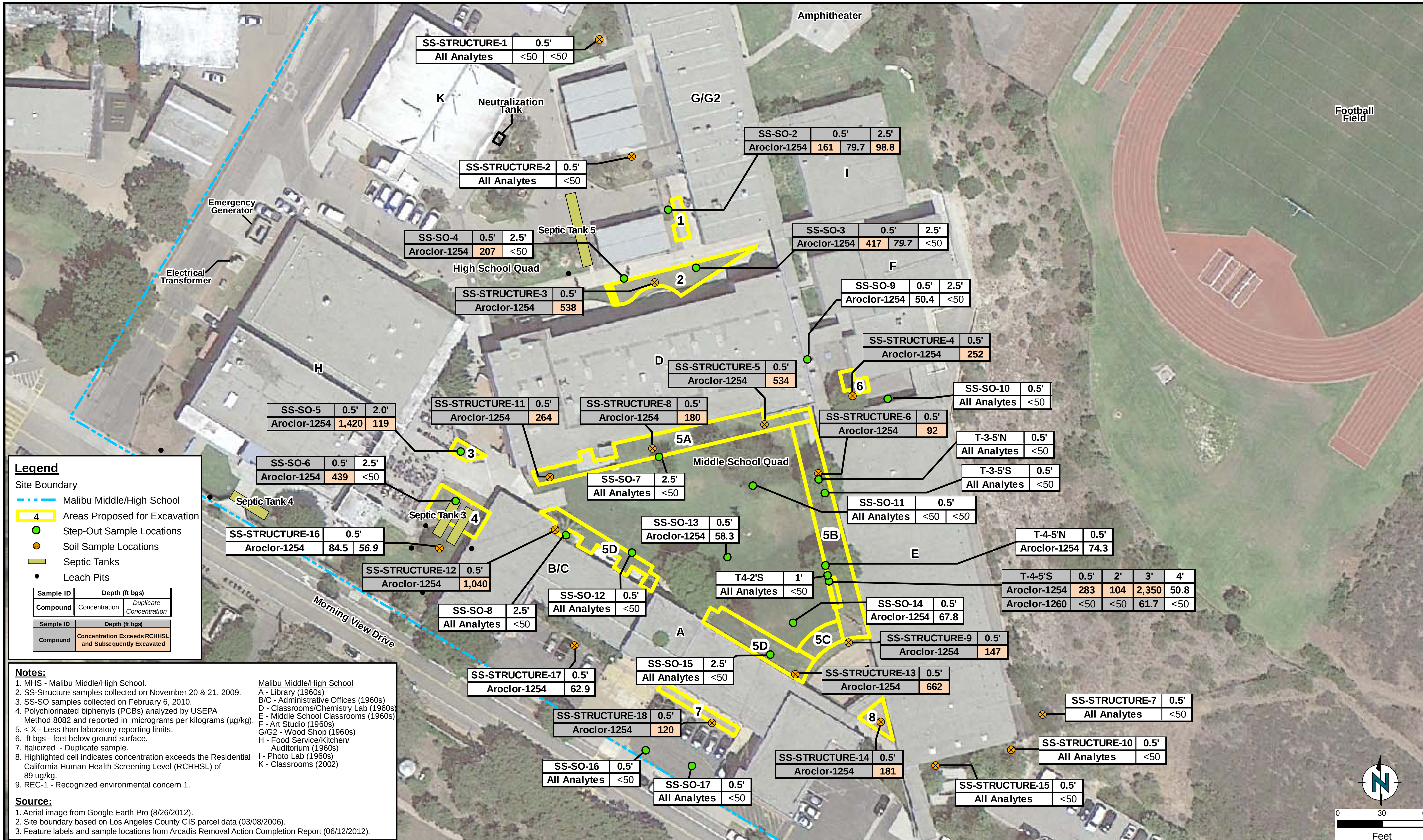
Soil Excavation for Pesticides on MHS - REC-1

30215 Morning View Drive, Malibu, California

Figure 15A

PROJECT: 04-33980A



Notes:

1. MHS - Malibu Middle/High School.
2. SS-Structure samples collected on November 20 & 21, 2009.
3. SS-SO samples collected on February 6, 2010.
4. Polychlorinated biphenyls (PCBs) analyzed by USEPA Method 8082 and reported in micrograms per kilograms (µg/kg).
5. < X - Less than laboratory reporting limits.
6. ft bgs - feet below ground surface.
7. Italicized - Duplicate sample.
8. Highlighted cell indicates concentration exceeds the Residential California Human Health Screening Level (RCHHSL) of 89 ug/kg.
9. REC-1 - Recognized environmental concern 1.

Malibu Middle/High School
A - Library (1960s)
B/C - Administrative Offices (1960s)
D - Classrooms/Chemistry Lab (1960s)
E - Middle School Classrooms (1960s)
F - Art Studio (1960s)
G/G2 - Wood Shop (1960s)
H - Food Service/Kitchen/ Auditorium (1960s)
I - Photo Lab (1960s)
K - Classrooms (2002)

Source:

1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundary based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 15B - Extent of Excavated Soil for PCBs on MHS - 2014-10-13.mxd

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Soil Excavation Areas on MHS - REC-1

30215 Morning View Drive, Malibu, California

Figure 15B

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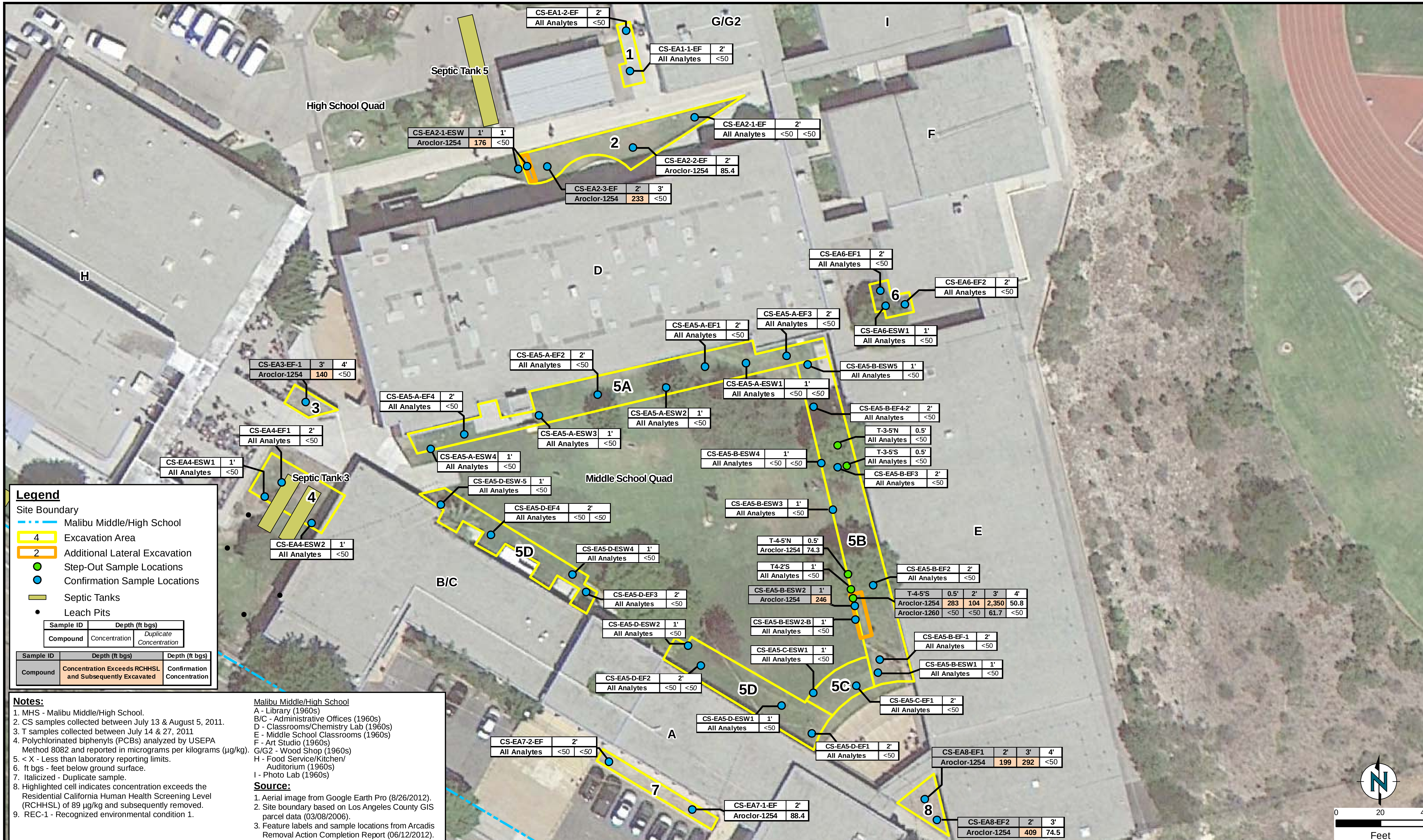


Legend

Site Boundary

- Malibu Middle/High School
- 4 Excavation Area
- 2 Additional Lateral Excavation
- Step-Out Sample Locations
- Confirmation Sample Locations
- Septic Tanks
- Leach Pits

Sample ID	Depth (ft bgs)	
Compound	Concentration	*Duplicate Concentration*

Sample ID	Depth (ft bgs)	Depth (ft bgs)
Compound	Concentration Exceeds RCHHSL and Subsequently Excavated	Confirmation Concentration

Notes:

1. MHS - Malibu Middle/High School.
2. CS samples collected between July 13 & August 5, 2011.
3. T samples collected between July 14 & 27, 2011
4. Polychlorinated biphenyls (PCBs) analyzed by USEPA Method 8082 and reported in micrograms per kilograms (µg/kg).
5. < X - Less than laboratory reporting limits.
6. ft bgs - feet below ground surface.
7. Italicized - Duplicate sample.
8. Highlighted cell indicates concentration exceeds the Residential California Human Health Screening Level (RCHHSL) of 89 µg/kg and subsequently removed.
9. REC-1 - Recognized environmental condition 1.

Malibu Middle/High School

A - Library (1960s)
B/C - Administrative Offices (1960s)
D - Classrooms/Chemistry Lab (1960s)
E - Middle School Classrooms (1960s)
F - Art Studio (1960s)
G/G2 - Wood Shop (1960s)
H - Food Service/Kitchen/ Auditorium (1960s)
I - Photo Lab (1960s)

Source:

1. Aerial image from Google Earth Pro (8/26/2012).
2. Site boundary based on Los Angeles County GIS parcel data (03/08/2006).
3. Feature labels and sample locations from Arcadis Removal Action Completion Report (06/12/2012).

Path: Z:\01_Projects\Malibu High School\03_GIS\PEA Investigation\Figure 15C - PCBs in Soil Confirmation Samples on MHS - 2014-10-13.mxd

ENVIRON

Confirmation PCB Soil Samples after Excavation on MHS - REC-1

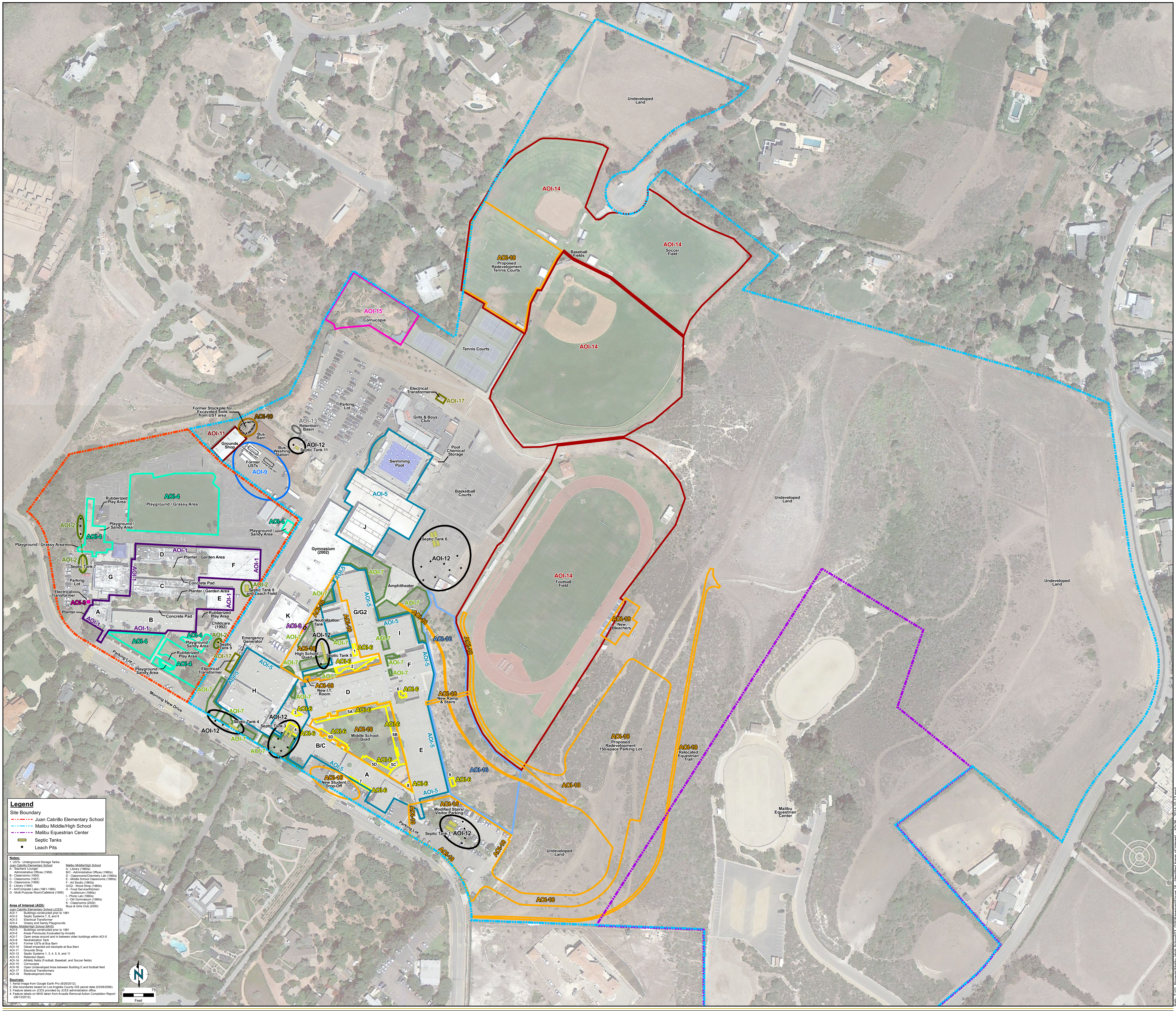
30215 Morning View Drive, Malibu, California

Figure 15C

DRAFTED BY: SShin

Date: 10/13/2014

PROJECT: 04-33980A



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DRAFTED BY: SShin | Date: 10/13/2014

Identified Areas of Interest

30237 and 30215 Morning View Drive, Malibu, California

Figure 16

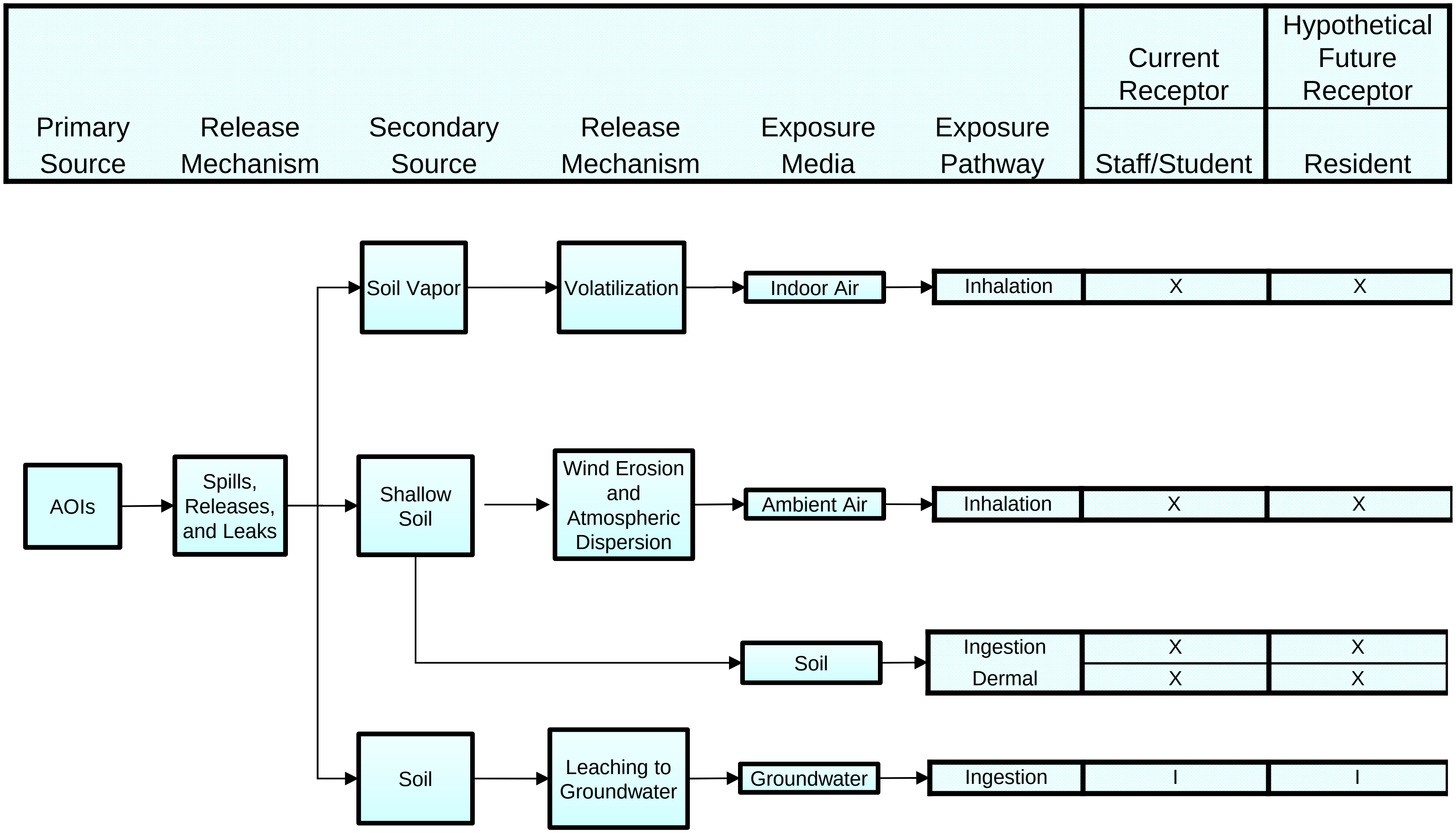
PROJECT: 04-33980A

ENVIRON

Existing and Proposed Sampling Locations

30237 and 30215 Morning View Drive, Malibu, California

Figure 17



<u>Notes:</u>
X = Potentially complete exposure pathway that will be evaluated
I = Incomplete exposure pathway that will not be evaluated
AOIs – Areas of Interest
HHSRE – Human Health Screening Risk Evaluation

FILE: Z:\01_Projects\Malibu High School\03_GIS\Figure 18

ENVIRON

Conceptual Site Model for HHSRE - Residential/School Scenarios

Figure 18

DRAFTED BY: SSS | DATE: 05/23/2014 | PROJECT: 04-33980A