

DRAFT

**DRAFT Preliminary
Endangerment Assessment
of Proposed Katherine
Johnson Middle School,
2641 Kent Drive,
Sacramento, California**

San Juan Unified School District

Project Number: 60682851

April 17, 2023

Quality Information

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EXECUTIVE SUMMARY

AECOM Technical Services, Inc. (AECOM) conducted a Preliminary Environmental Assessment (PEA) of the Proposed Katherine Johnson Middle School located at 2641 Kent Drive in Sacramento, California (Subject Property) located north of El Camino Avenue and east of Fulton Avenue in the City of Sacramento, California (Figure 1). The PEA was conducted for the San Juan Unified School District (SJUSD). The California Department of Toxic Substances Control (DTSC) provided regulatory oversight for the PEA.

The subject property consists of one parcel of land that is designated as Assessor Parcel Number (APN) 268-029-000-10000, approximately 9.75-acres. The subject property was an active adult center built in 1953 as an elementary school. The school consisted of gymnasium/multi-purpose room with stage, front office, library/media center, kitchen, classrooms, restrooms, utility rooms, server room, electrical rooms, breezeways, grass field, large, fenced vegetable garden, baseball field, basketball courts, four mobile trailers, and asphalt parking lots. (Figure 2).

Historical documents indicate that the subject property has been developed since at least 1954 through present day as an elementary school, head-start program/pre-school, and adult learning center. The school added basketball courts, what appears to be tennis courts, baseball field, and parking lots between the 1950s until the 1970s. Prior to the 1950s the subject property was cleared fields that appear to be agricultural.

The PEA field investigation was performed in March and April 2023, by Atlas Technical Consultants (Atlas) and TEG-Northern California (TEG), a licensed C-57 drilling contractor under contract with SJUSD. Soil samples were collected from 49 locations and submitted to environmental laboratories for analysis of various chemicals of concern (COCs), such as metals like arsenic and lead, volatile organic compounds (VOCs), organochlorine pesticides (OCPs), and polychlorinated biphenyls (PCBs). Active soil-vapor samples were also collected at 5 ft below ground surface (ft. bgs) and 10 ft bgs from dual-nested soil vapor points at two locations (SV-1 to SV-2) and submitted to an environmental laboratory for analysis of VOCs. Elevated concentrations of COCs were detected in five soil and both soil vapor samples. After discussions with the SJUSD and DTSC, follow-up soil vapor sampling was performed on April 7, 2023. The follow-up sampling included three additional soil vapor locations with samples collected from 5 ft bgs and 10 ft bgs dual-nested soil vapor points at each location.

A human health screening level evaluation was conducted using the laboratory analytical results. The maximum detected concentrations in on-site soil were compared to residential soil screening levels established by DTSC, the San Francisco Bay Regional Water Quality Control Board (SFRWQCB), and the United States Environmental Protection Agency (USEPA). The maximum detected concentrations in soil-gas were multiplied by an assumed indoor-air attenuation factor of 0.03 and then compared to residential air screening levels.

The PEA findings are summarized as follows:

- Arsenic was detected in all discrete soil samples that were analyzed (Table 1). The maximum detected arsenic concentration in discrete soil samples was 5.0 milligrams

per kilogram (mg/kg), which is significantly below background levels (Section 7.4.4). Elevated arsenic concentrations were limited to the native soil on cleared grassy fields to the north and west of the school structures. (Figure 2). A background data set was compiled from Arden Middle School and Katherine Johnson Middle School data sets to establish a general background arsenic concentration from the 95% Upper Tolerance Limit (UTL) to establish the Upper Threshold Value (UTV) of 6.2 mg/kg. All samples were below the UTV of 6.2 mg/kg.

- Lead was detected in all discrete soil samples that were analyzed (Table 1). The maximum detected lead concentration was 27 mg/kg, (Section 7.4.4). All lead detections were below the residential screening level (SL) of 80 mg/kg.
- A PCB compound identified as PCB-1260 was detected at concentrations of 0.0027 J¹ mg/kg at KJMS-3, 0.0023 J mg/kg at KJMS-6, and 0.0086 J mg/kg at KJMS-11. These surface soil samples were collected near the southernmost classrooms and office buildings. The detected concentrations are well below the residential screening level of 0.24 mg/kg. No other PCBs were not detected in any other soil samples.
- Several OCPs were detected in one soil sample (KJMS-OP4) and its duplicate (Table 2). The following OCPs were detected: 4,4-DDD at a concentration of 0.00035 J mg/kg, 4,4,-DDE at a concentration of 0.0052 mg/kg, and 4,4-DDT at a concentration of 0.0082 mg/kg. All concentrations are well below their respective residential SLs of 1.9 mg/kg, 2.0 mg/kg, and 1.9 mg/kg.
- Various VOCs were detected in the active soil-gas samples (Table 5), including benzene and tetrachloroethene (PCE). Benzene was detected in four out of five soil vapor samples. At 5 ft bgs, benzene concentrations ranged from 4.1 microgram per cubic meter (µg/m³) to 14 µg/m³. At 10 ft bgs, benzene concentrations ranged from 3.9 µg/m³ to 11 µg/m³. These detections exceed the residential SLs of 0.097 µg/m³ and the commercial SL of 0.42 µg/m³. Tetrachloroethene was detected in one soil vapor sample (SV-1d) from 10 ft bgs at a concentration of 19 µg/m³, which exceeds the residential SL of 0.46 µg/m³. No other VOCs detections exceeded the residential SLs.
- Two surface soil samples were collected at 0.5 ft bgs near the shed. Neither soil sample had detections of VOCs.
- A human health screening evaluation was performed in accordance with PEA guidance. For COCs detected in soil, the cumulative calculated excess cancer risk was 3.0E-04, which is less than 1.0E-06 and is therefore considered acceptable. The calculated hazard index is 18, which is greater than 1.0 and is therefore considered unacceptable. Using an assumed indoor-air attenuation factor of 0.03, the total cumulative calculated excess cancer risk for all COCs detected in soil gas at 5-ft bgs was 1.4x10⁻⁰⁴, and at 10 ft bgs was 1.1x10⁻⁰⁴. The calculated hazard index for air was 4.5 based on COC detections in soil-gas at 5-ft bgs and was 3.5 based on COC detections in soil-gas at 10-ft bgs. Anticipated indoor air concentration was calculated by taking the maximum detected soil vapor concentration of 8.8 µg/m³ and multiplying it by the attenuation factor of 0.03. When calculated (8.8 x 0.03 = 0.264), the resulting

¹ The J Laboratory flag. Result is less than the RL but greater than or equal to the MDL and the concentration is an estimated value

converted detection exceeds the residential SL for indoor air, cancer endpoint of $0.097 \mu\text{g}/\text{m}^3$. The attenuation factor of 0.03 is consistent DTSC's Supplemental Guidance: Screening and Evaluating Vapor Intrusion (2022, DTSC) and is considered conservative for two primary reasons: (a) large modern classroom buildings to be designed and constructed according to the strict standards required of publicly funded schools in California are expected to have lower attenuation factors than the residential buildings on which the assumed attenuation factor of 0.03 was primarily based, and (b) substantial bioattenuation of petroleum vapors is expected in the upper 5 ft of soil.

Based on these findings, AECOM recommends that DTSC approve this PEA Report with a determination that further action is needed before school occupancy occurs. The further action should include preparation of a Supplemental Site Investigation (SSI) to address the impacted soil vapor near proposed school buildings.

1 INTRODUCTION

This report presents the methods and results of a Preliminary Endangerment Assessment (PEA) of the Proposed Katherine Johnson Middle School at 2641 Kent Drive in Sacramento, California (Figure 1). The PEA was conducted by AECOM Technical Services, Inc. (AECOM) for the San Juan Unified School District (SJUSD). The SJUSD entered an Environmental Oversight Agreement (EOA) with the California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) signed on September 8, 2022. In accordance with the EOA, DTSC provided regulatory oversight for the PEA, which was conducted to fulfill the requirements of California Education Code section 17213.1.

SJUSD is building a new school campus on the Subject Property. The school will contain up to approximately 28 classrooms and 650 students at full capacity with a completion date of August 2024. Water and sewer services for the school will be provided by the municipal systems of the City of Sacramento Utilities Department.

This report was prepared in accordance with DTSC guidelines, as detailed in the PEA Guidance Manual [DTSC, 2015] and supplemental written guidelines for conducting PEAs of planned K-12 school Subject Properties. Project-specific direction was provided by the DTSC project manager, Ms. Lisa Holcomb, in the Sacramento office. The PEA was conducted in accordance with the PEA Workplan for the Subject Property [AECOM, 2023].

The limited investigative sampling information, sampling, implementation, and data has been furnished to AECOM by SJUSD and was conducted by a third party (Atlas), which AECOM has used in preparing this report. AECOM has relied on this information as furnished and is neither responsible for nor has confirmed the accuracy of this information.

This report is organized as follows:

- The Executive Summary briefly presents the PEA methods and results.
- Section 1.0 presents an introduction to the project.
- Section 2.0 presents the objective and scope of the project.
- Section 3.0 presents the Subject Property location and description.
- Section 4.0 presents background information regarding the Subject Property.
- Section 5.0 presents the environmental setting of the Subject Property.
- Section 6.0 presents the potential problem addressed by this PEA.
- Section 7.0 presents the sampling activities and results.
- Section 8.0 presents the human health screening evaluation.
- Section 9.0 presents public participation information.
- Section 10.0 presents project quality assurance/quality control (QA/QC) information.
- Section 11.0 describes health and safety plan implementation.
- Section 12.0 describes variances from the approved PEA Workplan.
- Section 13.0 presents conclusions and recommendations.
- Section 14.0 presents limitations of this report.
- Section 15.0 presents relevant references.
- Tables, figures, and appendices are presented after Section 15.0.

2 OBJECTIVE AND SCOPE

The objective of the PEA was to evaluate whether current or past hazardous material management practices at the Subject Property have resulted in a release or releases of hazardous materials that pose a threat to public health or the environment. To meet this objective, the PEA included the following scope of work:

- Evaluating available information for indications of the past use, storage, disposal, or release of hazardous wastes/substances at the Subject Property.
- Preparing the PEA Workplan that summarized existing Subject Property data and presented a proposed field sampling plan, quality assurance plan, and health and safety plan.
- Evaluating through a field sampling and analysis program the nature and general extent of hazardous materials present in environmental media at the Subject Property.
- Estimating the potential threat to public health posed by hazardous materials at the Subject Property using a residential land-use scenario.
- Preparing this report summarizing the rationale, methods, and findings of the investigation.

3 SUBJECT PROPERTY LOCATION AND DESCRIPTION

The subject property is located at 2641 Kent Drive, north of El Camino Avenue and west of Fulton Avenue in the City of Sacramento, California (Figure 1). The approximately 9.75-acre Subject Property consists of the entirety of the parcel, Assessor Parcel Number: 268-029-000-10000. The assessor's maps are provided in Appendix A. The parcel is owned by the San Juan Unified School District.

The Subject Property was developed with six buildings, four mobile trailer classrooms, one restroom building, and a storage shed. The school consisted of a main office, multi-purpose gymnasium/cafeteria/stage, kitchen, hallways, classrooms, utility closets, server room, storage rooms, custodian office/mechanical room, two storage sheds, covered walkways, grass fields, basketball courts, large vegetable garden, and asphalt-paved parking lots. (Figure 2).

Land use adjacent to the Subject Property consists of residential development to the north, west, south, and east. The Town and Country Pre-school and Daycare is adjacent to the subject property on the southwest corner. Commercial development is located further east and south of the subject property along Fulton Avenue and El Camino Avenue. The Chicken Ranch Slough runs along the northern property boundary.

4 BACKGROUND INFORMATION

This section presents a summary of background information for the Subject Property. Additional information was provided in the AECOM Phase I Environmental Site Assessment (ESA) (AECOM, 2022) and PEA Workplan [AECOM, 2023]. The Subject Property consists of one parcel of land, designated as Assessor's Parcel Number 268-0290-001. The Site is generally surrounded to the north, west, east, and south by residential development. Town and Country Preschool and Child Daycare (2550 Belpoint Lane), adjoining the southwestern corner of the Site, and Chicken Ranch Slough, adjoining the northern Site boundary, are two sensitive receptors. No other sensitive receptors (i.e., day care centers, schools, hospitals) are located adjacent to the Site. Beyond the neighboring residential properties, the area is developed for commercial use further east and south along Fulton Avenue and El Camino Avenue.

The Subject Property was most recently utilized as the Creekside Adult Center, assisting individuals with various needs, such as obtaining their Graduate Equivalency Degree, learning English as a second language, or career development courses. The Subject Property has been developed since at least 1953 through present day as an elementary school, head-start program/pre-school, and adult education center.

A Sacramento Municipal Utility District (SMUD) pad-mounted transformer and electrical switch box were located south of the mechanical room within a fenced exterior area. The transformer was not marked as to whether it contains PCBs or non-PCBs material. No signs of spills or releases were observed under or around the transformer during the August 2022 ESA Site visit.

A storage shed was located on the southeastern corner of the southeastern parking lot. The shed housed empty shelving, furniture, and miscellaneous items. Historically, the shed may have also stored chemicals for cleaning (solvents), maintenance (oils and fluids), lawn care (gasoline), and other school-related activities.

During AECOM's ESA Site visit, no visual evidence of aboveground storage tanks or underground storage tanks (USTs), (i.e., vent pipes, fill ports, or piping), irrigation or potable water wells, monitoring wells, dry wells, clarifiers, or septic systems was observed. In addition, no evidence of discolored soil, standing surface water, stressed vegetation, or unusual odors was observed during the ESA Site visit.

During AECOM's ESA, the Site was identified in the Environmental Database Resources (EDR) environmental database report as Creekside Adult Center. The Site is listed in the Hazardous Waste Tracking System with Environmental Protection Agency (EPA) Identification Number CAL000033748, issued in 1990 then listed as inactive in 1995. In 2007, the Site generated one 55-gallon drum of nonfriable asbestos mastic and disposed off site at an appropriate facility. No other records were noted in the EDR database report.

During AECOM's historical review for the ESA, a number of surrounding sites were identified in the EDR database report. The majority of these sites were listed for compliance or administrative issues in various databases, closed dry cleaners, or closed Leaking UST cases. AECOM noted Bates Cleaners, formerly located at 3007 El Camino Avenue, approximately 559 ft to the south of

the Site. Bates Cleaners operated as a dry cleaner in 1965, but no information was available in the EnviroStor database or the State Water Resources Control Board's (SWRCB's) online GeoTracker database. Based on the limited information and topographically cross-gradient location of this historical dry cleaner facility, it presents a recognized environmental condition (REC) and off-site gas encroachment condition in connection with the Site. AECOM's ESA did not identify any other recognized environmental conditions (RECs).

5 ENVIRONMENTAL SETTING

This section summarizes available information on the topography, geology, hydrology, and climatology of the Subject Property and vicinity.

5.1 Topography

According to the United States Geological Survey (USGS) topographic map of the subject property area (Rio Linda, Carmichael, Citrus Heights, and Sacramento East CA quadrangles) and a review of Geocheck Physical Setting in the EDR report, the elevation of the subject property is approximately 59 ft above mean sea level (msl). Based on a review of these technical resources and AECOM's site visit, the subject property appears to be generally flat with a slight downward slope toward the west/southwest.

5.2 Geology

The Subject Property lies within the northeastern part of the Great Valley Geomorphic Province of California. The valley is approximately 400 miles long and averages 50 miles wide. The valley has been filled with a thick sequence of marine and nonmarine sediments dating from the late Jurassic to the Holocene periods. The uppermost strata of the Great Valley represent, for the most part, the alluvial, flood, and delta plains of two major rivers (Sacramento and San Joaquin Rivers) and their tributaries.

The Subject Property is located in the Sacramento Valley, bounded to the north by the Northern Sacramento-Valley and bounded to the south by the San Joaquin Valley.

The Subject Property is located within the South American groundwater Subbasin. This subbasin comprises the following types of sediments (California Groundwater Bulletin 118):

- Flood plain deposits comprising silt and clay interbedded with sands from Sacramento River;
- Younger alluvium comprising silt, fine- to medium-grained sand, and gravel occurring along Sacramento River; and
- Older alluvium sediments comprising loosely to moderately compacted sand, silt, and gravel deposited in alluvial fans during the Pliocene and Pleistocene.

USEPA's Map of Radon Zones assigns each county in the United States to one of three zones based on radon potential, with Zone 1 having the highest potential and Zone 3 the lowest (<http://www.epa.gov/radon/zonemap.html>). Sacramento County is mapped in Zone 3. Counties in Zone 3 are predicted to have average indoor radon screening levels of less than 2 picoCuries per liter. The California Department of Public Health has not posted a special report on radon for Sacramento County on its website for the Subject Property.

(<http://www.cdph.ca.gov/HealthInfo/environhealth/Pages/RadoninCalifornia.aspx>)

DTSC does not require further radon evaluation for proposed school Subject Property unless they are located within USEPA Zone 1 or within an area identified as significant for radon potential

based on other local or regional information. Based on the available information summarized above, radon is not considered a concern for the Subject Property.

5.3 Hydrology

The Subject Property lies in the South American Subbasin is bounded on the east Sierra Nevada, on the west by the Sacramento River, on the north by the American River, and on the south by the Cosumnes and Mokelumne Rivers. These perennial rivers generally create a groundwater divide in the shallow subsurface. It is clear that there is interaction between groundwater of adjacent subbasins at greater depths. The present-day drainage system outfalls to the American River.

According to information provided by the California State Water Resources Control Board (SWRCB) online GeoTracker database, depth to groundwater measured at the Chevron No. 9-8966 site located at 2500 Fulton Avenue, approximately 1,560 ft to the southwest of the subject property, was measured at depths of approximately 94 to 96 ft below ground surface (bgs) in 2009 and the groundwater flow direction was calculated as southwest. It should be noted that the actual depth and flow direction of groundwater beneath the subject property cannot be determined without site-specific groundwater monitoring well data.

5.4 Climatology

The climate at the Subject Property is characterized by mild winters and hot, dry summers. Winter low temperatures at the Subject Property are occasionally below 40° Fahrenheit, and summer high temperatures often exceed 100° Fahrenheit. Prevailing winds are typically from the northwest. Average annual precipitation ranges from about 14 inches along the western boundary to greater than 20 inches along the eastern boundary; (California Groundwater Bulletin 118). Evaporation amounts in the region significantly exceed precipitation amounts over the course of a typical year.

6 POTENTIAL SOURCES OF CONTAMINATION

Locations of the current and former structures are shown on Figures 2. The six existing structures were constructed between the 1950s and 1970s. Approximately the entire parcel of 9.75 acres was an agricultural until the 1950s.

Potential sources of hazardous materials contamination for the Subject Property includes the following:

- Application of pesticides to cropland, including arsenic, lead, and organochlorine pesticides (OCPs).
- Lead from lead-based paint potentially used on current or former structures constructed prior to the early 1990s when it was no longer permitted for lead-based paint to be used on industrial/commercial buildings.
- Termiticides potentially used near structures constructed prior to 1989.
- Polychlorinated biphenyls (PCBs) potentially used in window caulking in on-Subject Property structures constructed prior to 1979.
- PCBs potentially used in electrical transformers installed prior to 1979.
- Hazardous materials that may have been used at a former dry-cleaning shop (located at 3007 El Camino Avenue, approximately 559 ft south of the Subject Property) and operated in 1965.

7 SAMPLING ACTIVITIES AND RESULTS

The subsections below describe the PEA field sampling activities and results completed by a third-party environmental consultant, Atlas Technical Consultants (Atlas). The services of Atlas were contracted by Kitchell. Section 7.1 provides a summary of the sampling activities. Section 7.2 describes clearance for underground utilities prior to the subsurface investigation. Section 7.3 provides details on the sampling rationale and methodology. Section 7.4 discusses the results of the PEA.

The limited investigation sampling procedures, implementation, and data have been furnished to AECOM by SJUSD and was conducted by a third party(Atlas), which AECOM has used in preparing this report. AECOM has relied on this information as furnished and is neither responsible for nor has confirmed the accuracy of this information.

7.1 Summary of Activities

The PEA field sampling was performed on March 13 -16 and April 7, 2023. Soil and soil-gas samples were collected from areas of concern and analyzed for COCs. Groundwater was not sampled or analyzed for this PEA. The complete Atlas Limited Investigation Report for Katherine Middle School, 2641 Kent Drive in Sacramento, California is attached in Appendix A.

The sampling was conducted in accordance with the PEA Workplan. Summaries of the analyses of discrete, composite samples on the Subject Property, are presented in the Atlas Report: Table 1 – Lead and Arsenic in Soil, Table 2 – Organochlorine Pesticides in Soil, Table 3 – Polychlorinated Biphenyls in Soil, Table 4 – Volatile Organic Compounds in Soil and Table 5 – Summary of Soil Vapor Sample Analytical Results. These tables are included in “*Limited Investigation Report and Addendum*” by Atlas and attached as Appendix A.

Elevated concentrations of COCs were detected in some of the original soil samples. After discussions with SJUSD and DTSC, follow-up soil gas sampling was performed in on April 7, 2023, discussed further in Section 7.3.1.

AECOM's ESA (2022) also included review of previously prepared environmental reports in connection with the Subject Property. The Entek Consulting Group Inc. (Entek) Hazardous Materials Survey Final Report (Entek 2022) identified asbestos-containing materials and lead-based paint within the Site structures. Entek also supplied requirements for the containment and disposal of these hazardous materials during any proposed demolition activities.

7.2 Boring Clearance

It is AECOM's understanding, at least 48 hours prior to commencement of subsurface investigations, Underground Services Alert (USA) was notified of the intent to conduct such investigations at the Subject Property by Atlas. Proposed locations of subsurface investigation were marked with white paint or surveyors flagging as required by USA. USA contacted utility owners of record within the Subject Property vicinity and notified them of the intention to conduct subsurface investigations in proximity to buried utilities. Utility owners of record, or their

designated agents, were expected to clearly mark the position of their utilities on the ground surface throughout the area designated for investigation.

7.3 Sampling and Analysis

The following subsections describe soil sampling and analysis performed for the PEA by Atlas. Subsection 7.3.1 discusses sampling locations and rationale. Detailed sampling protocols for soil and soil-gas sampling are presented below in separate subsections.

7.1.1 Sampling Locations and Rationale

Soil and soil-gas samples were collected to assess the areas of concern described in Phase I ESA conducted by AECOM (2022). Locations and rationale are described below.

Sample locations on the Subject Property comprised the following:

- Ten surface soil sample locations (KJMS-OP1 – KJMS-OP5, plus duplicate (KJMS OP Dup for OCPs) and (KJMS-AR1 – KJMS-AR5, plus one duplicate KJMS-AR Dup for arsenic) addressed the former agricultural area in the northern and west portions of the Subject Property (Figure 2, Tables 1 and 2) to assess for arsenic and OCP impacts. At each of these locations, a surface soil sample was collected from 0 to 6 inches bgs. The OCPs samples were composited at a 4:1 ratio and arsenic samples were collected as discrete samples.
- Twenty-nine surface soil sample locations (KJMS-1 – KJMS-29, plus three duplicates KJMS-Dup#1, #2, & #3) were collected from each side of each existing structure, within 2 ft of each wall, surface soil samples were collected to assess for lead and PCBs impacts (Figures 2, Tables 1 and 3). The surface soil samples were collected from 0.0 to 0.6 ft bgs. Due to wet conditions, sample locations KJMS-25 through KJMS-29 were newly covered with up to 18 inches of clean road base material to allow construction vehicles to transverse the Subject Property. At these locations, the road base material was removed and the samples were collected from the native soil at 0 to 6 inches bgs.
- Two soil samples were collected for VOCs analysis on each side of a shed located on the southeast corner of the Subject Property that was used to house lawn mowers, landscaping equipment, and small containers of gas and oil. These sample locations (Shed-1 and Shed-2) were collected from 0 to 6 inches bgs on the west and east side of the shed.
- Four soil sample locations (KJMS-T1 through KJMS-T4) were placed underneath each side of the electrical transformer pad to assess for PCB impacts (Figure 2, Table 3). At each of these locations, a surface soil sample was collected from 0 to 6 inches bgs and a subsurface soil sample was collected at 1.5 ft bgs.
- Two sets (dual nested at 5 and 10 ft bgs) temporary active soil gas sampling locations (SV-1s, SV-1d, SV-2s, and SV-2d) were placed near the southeast boundary of the Subject Property to assess for possible impacts from the nearby former dry cleaner (Figure 2, Table 5). At each of the four sampling locations, active soil gas samples were collected at approximately 5 and 10 ft bgs. The samples were analyzed for volatile organic compounds (VOCs). Elevated concentrations of COCs were detected

in some of the original soil gas samples (Figures 2, Table 5), including elevated levels of tetrachloroethene (PCE) and benzene.

After discussions with SJUSD and DTSC, follow-up soil gas sampling was performed to assess the lateral and vertical extents of soil containing elevated COC concentrations (Figures 2, Table 5). Three additional soil gas locations (KJMS-SV-3s, KJMS-SV3d, KJMS-SV4s, KJMS-SV4d, KJMS-SV5s, and KJMS-SV5d) were installed to the north of the first two sampling locations at 5 and 10 ft bgs to further delineate the lateral extent of the impact towards the proposed new school building locations. At each of the six sampling locations, active soil gas samples were collected at approximately 5 and 10 ft bgs. The samples were analyzed for VOCs. This information is in the *“Limited Investigation Report Addendum”* by Atlas. This report is attached in Appendix A.

- “Blind” field duplicate soil samples were collected and analyzed at a minimum rate of 10% of the total number of primary samples (Tables 1 to 5). The field duplicate samples were given unique names that did not indicate to the laboratory that they were duplicate samples.

7.1.2 Discrete Soil Sample Collection Procedures

Soil and Soil Gas sample collection procedures are described in the attached *“Limited Investigation Report and Addendum”* by Atlas and is attached in Appendix A.

7.1.2.1 Decontamination

All non-disposable equipment that came into contact with potentially contaminated soil was decontaminated to assure the quality of samples collected. Such equipment included the hand auger, drive sampler, and equipment used to loosen surface soil for sampling. Disposable equipment intended for one-time use was not decontaminated but was packaged for appropriate disposal. Decontamination included a detergent/water wash followed by double rinsing in clean water. Decontamination occurred before and after each use of a piece of equipment. Since there was no contact with apparently grossly contaminated material, water generated during equipment decontamination was spread on the ground at the Subject Property.

7.1.2.2 Collection of Background Soil Samples

No background soil samples were collected for the PEA. As set forth in the PEA Workplan the analytical results for arsenic on the Subject Property soil samples were compared to a background data set from a nearby previous school-site PEA project. The school site known as the Arden Middle School (DTSC Subject Property Code 104836) is located at 1640 Watt Avenue in Sacramento, California, approximately 1.5 miles south/southeast of the Subject Property in a similar geologic/soil setting. Discussion of the background data set is provided in Section 7.4.4.

7.1.3 Active Soil-Gas Sampling

A total of five dual-nested temporary soil gas probes were installed by TEG-Northern California (TEG), a third-party contractor under contract with SJUSD. The installation information is attached in the *“Limited Investigation Report and Addendum”* by Atlas and is included in Appendix A.

7.1.4 Field Documentation and Sample Handling Procedures

During field activities, field reports were used to document where, when, how, and from whom any vital project information was obtained. Field report entries were complete and accurate enough to permit reconstruction of field activities. Each page was dated and the time of entry noted. All entries were legible, written in black ink, and signed by the individual making the entries. If an error was made, corrections were made by crossing a line through the error and entering the correct information. Corrections were dated and initialed. No entries were obliterated or rendered unreadable. At a minimum, the following items were recorded in the field reports:

- Subject Property name and address.
- Recorder’s name.
- Team members and their responsibilities.
- Time of Subject Property arrival/entry on Subject Property and time of Subject Property departure.
- Other personnel on-Subject Property.
- A summary of any on-Subject Property meetings.
- Health and safety monitoring data.
- Deviations from sampling plans and Subject Property safety plans.
- Changes in personnel and responsibilities as well as reasons for the changes.
- Levels of safety protection.
- Calibration readings for any equipment used and equipment model and serial number.

COC records were used to document sample collection and shipment to the laboratory for analysis. All sample shipments for analyses were accompanied by a COC record. The COC record identified the contents of each shipment and maintained the custodial integrity of the samples. Generally, a sample is considered to be in someone’s custody if it is either in someone’s physical possession, in their view, locked up, or kept in a secured area that is restricted to authorized personnel. Until receipt by the laboratory, the custody of the samples was the responsibility of the sample collector.

These records are attached in the *“Limited Investigation Report and Addendum”* by Atlas in Appendix A.

7.1.5 Analytical Procedures

Analytical services for soil, soil-gas, and water samples were provided by one or more laboratories that are accredited under the California Department of Health Services, Environmental Laboratory Accreditation Program (ELAP). Pace Analytical Environmental Sciences of Bakersfield, California analyzed the soil samples for PCBs by EPA Method 8082, lead and arsenic by EPA Method 6010B with Total Concentrations (TTLC), OPCs by EPA Method 8081A, and VOCs by EPA Method 8260D. H&P Mobile Geochemistry Inc. of Carlsbad, California analyzed the soil-gas samples were analyzed for TO-15, and for leak check compound 1.1-DFA (difluoroethane). The laboratories were instructed to report estimated values, i.e., between the method detection limit and reporting limit, with a “J” qualifier. The laboratory results are included in the *“Limited Investigation Report and Addendum”* by Atlas attached in Appendix A.

7.4 DISCUSSION OF RESULTS

Results of the PEA are discussed in the subsections below. Appendix A contains the laboratory reports.

7.4.1 Analytical Results for Soil Samples

A summary of the chemicals detected in soil, including the maximum concentrations detected on the Subject Property, is presented in Tables 1-4 of the attached *“Limited Investigation Report and Addendum”* by Atlas included in Appendix A.

Some of the soil samples contained chemicals of concern (COCs) at concentrations exceeding their respective DTSC residential screening levels set forth in Human Health Risk Assessment (HHRA) Note Number 3, June 2020 (revised May 2022), DTSC-Modified Screening Levels for Residential Land Use [DTSC, June 2020 (revised May 2022)] and US EPA Regional Screening Levels for residential soils reflecting the lower of the carcinogenic or noncarcinogenic endpoints (US EPA, May 2021). The original surface soil samples with COC concentrations exceeding the screening levels are reported in Tables 1-4 of the attached *“Limited Investigation Report and Addendum”* by Atlas in Appendix A.

Based on laboratory analysis of the soil samples collected in March 2023, lead, OCPs, PCBs, and VOCs were not detected in any soil samples collected during this investigation at concentrations exceeding the DTSC and US EPA Screening Levels.

Arsenic was detected in all discrete soil samples that were analyzed (Table 1) with concentrations ranging from 2.6 mg/kg to 5.0 mg/kg, which exceeds the HHRA Note 3 SL of 0.11 mg/kg and US EPA RSLs of 0.68 mg/kg.

Lead was detected in all discrete soil samples that were analyzed (Table 1) with concentrations ranging from 3.6 mg/kg to 27 mg/kg. The maximum detected lead concentration in discrete soil samples was 27 mg/kg. Lead concentrations did not exceed the HHRA Note 3 SL of 80 mg/kg and US EPA RSLs of 400 mg/kg for residential soils.

Lead and several OCPs were detected in several of the soil samples that were analyzed (Table 1 and 2). All detections were at concentrations well below the respective residential screening

levels. The 95-percent upper confidence limit of the mean (95%-UCL) concentrations was calculated using ProUCL version 5.1 (attached Work Sheet) for lead which resulted in 95% UCL is 10.05 mg/kg. These calculations are presented in the attached tables (Tables 8, 9, & 10). The 95%-UCL concentrations are all below the respective residential screening level of 80 mg/kg.

Based on the results summarized above, it appears that surficial soils meet the requirements for use as a school property.

7.4.2 Analytical Results for Soil-Gas Samples

The laboratory analytical results for active soil-gas samples are summarized in Table 5 *“Limited Investigation Report and Addendum”* by Atlas included in Appendix A. Several VOCs, including benzene and tetrachloroethene (PCE), were detected in the soil-gas samples. Detected concentrations in March 2023 and April 2023 were relatively similar. Benzene was detected in all five sampling locations (Figure 2), which is near the southeast parking lot. PCE was detected at locations SV-1d & SV2d at 10 ft bgs. These results were included in the human health screening evaluation discussed in Section 8.0.

The leak-test compound, 1,1-DFA, was not detected in any of the soil gas samples. The soil-gas sampling guidance allows the leak-test compound to be detected at up to 5 percent of the concentration inside the shroud [DTSC, 2023]. See the attached *“Limited Investigation Report and Addendum”* by Atlas included in Appendix A.

7.4.3 Analytical Results for Background Soil Samples

As stated in Section 7.3.2.2, no background soil samples were collected for the PEA. As proposed in the PEA Workplan, the analytical results for arsenic in the Subject Property soil samples were compared to a background data set from a nearby previous school-Subject Property PEA project. The previous PEA was for a school Subject Property known as Arden Middle School (DTSC Subject Property Code 104836) located at 1640 Watt Avenue in Sacramento, California, which is approximately 1.5 miles south/southeast of the current Subject Property in a similar geologic/soil setting as the current Subject Property. The geology of these two Subject Properties has been compared by AECOM. Both Subject Properties are geologically mapped as being in the same area of unconsolidated deposits of Quaternary older alluvium [Page & LeBlanc, 1969]. A geologic map showing the locations of the current “Subject Property” and the previous “Arden Middle School Subject Property” is provided in Appendix C. Geomorphically, both Subject Properties lie within the compound alluvial fan of intermittent streams north of the Sacramento and American Rivers. According to the U.S. Department of Agriculture, Natural Resources Conservation Service (<http://websoilsurvey.nrcs.usda.gov>), soils at both school sites are younger alluvium comprising silt, fine- to medium-grained sand, and gravel occurring along Sacramento River; and older alluvium sediments comprising loosely to moderately compacted sand, silt, and gravel deposited in alluvial fans during the Pliocene and Pleistocene. Based on these considerations, the school sites are considered to have similar geologic/soil settings. The background data set consisted of 12 samples from Arden Middle School and 5 samples from Katherine Johnson Middle School and where summed for a mean of 3.759 mg/kg, with a standard deviation of 0.974, and a Background Threshold Value (BTV) was established at 6.179 mg/kg from the data, which is provided in (Table 11) and in attached (Appendix C).

8 HUMAN HEALTH SCREENING EVALUATION

The subsections below present the methodology and results of the human health screening evaluation.

The PEA screening evaluation for human health effects consisted of three steps:

- 1) Identifying potentially complete exposure pathways based on the conceptual Subject Property model (CSM);
- 2) Identifying COCs; and
- 3) Estimating COC exposures or doses and comparing the dose to health-based levels developed by USEPA and Cal/EPA; in compliance with the PEA Guidance Manual [DTSC, 2015], a residential land-use scenario was used to estimate human health risks at the Subject Property.

Exposure to chemicals can only occur if there is a complete pathway by which chemicals on Subject Property soil, water, or air can be contacted by humans. Therefore, the evaluation of exposure pathways is the first step in the human health screening evaluation. Potential dose and risk are then calculated based on an evaluation of potential exposure concentrations of the COCs, the chronic daily intake or dose for the hypothetical residential adult and child receptors, and the estimated health risks based on the toxicity values of each COC as discussed below in Section 8.4. The findings of the human health screening evaluation are summarized in the risk characterization summary. The uncertainty section presents factors in the risk assessment that may have resulted in an overestimation or underestimation of risk in this screening evaluation and is provided for assistance in the risk management decision-making process.

8.1 Exposure Pathways and Media Of Concern

The subsections below present the exposure pathways and media of concern.

8.1.1 Conceptual Subject Property Model

The CSM, included as Figure 5, provides a description of the links between potential contaminant sources and release mechanisms at the Subject Property and exposure point media (soil, groundwater, air, etc.), potential exposure routes (ingestion, inhalation, dermal contact, etc.), and potential receptors. The receptors identified in the CSM include future construction workers and school students and staff. However, as discussed above and in accordance with DTSC, 2015, a residential land-use scenario is used for evaluating potential health effects to receptors. The residential land-use scenario is used in the screening evaluation because it is intended to provide a more stringent or health-conservative preliminary evaluation of potential health risks for any human receptors.

8.1.2 Soil Exposure Pathways

Chemicals detected in soil at the Subject Property comprise lead, arsenic, PCBs, and OCPs (Tables 1 to 4). The potential exists for humans to contact these chemicals through direct dermal

contact with the soil, incidental soil ingestion, and, as discussed below, inhalation of airborne particulate matter. For the purposes of the PEA, these pathways were considered complete and evaluated in the human health screening evaluation.

8.1.3 Water Exposure Pathways

Groundwater samples were not collected for this PEA. The water supply for the school will be obtained from the City of Sacramento municipal system. Surface water is not present at the Subject Property. Therefore, a water exposure pathway was not evaluated for the human health screening evaluation.

8.1.4 Air Exposure Pathways

Exposure to chemicals present in soil may occur through inhalation of airborne particulates to which chemicals have become absorbed, or through inhalation of VOCs in indoor or outdoor air. Residential exposure to fugitive dust was evaluated for all COCs detected in the Subject Property soil. For VOCs detected in soil-gas samples (Table 5), residential exposure to inhalation of VOCs in indoor air was evaluated.

8.1.5 Summary of Selected Exposure Pathways

For the purpose of this PEA screening evaluation, it was assumed that the hypothetical receptor would be exposed to chemicals detected in the Subject Property soil through direct dermal contact, incidental ingestion, and inhalation of airborne particulates, and to chemical detected in on-Subject Property soil-gas through inhalation of VOCs in indoor air.

8.2 Exposure Point Concentrations and Chemicals

Tables 1 through 4 presents the list of chemicals detected in the Subject Property soil and identifies which of those chemicals were included as COCs for the human health screening evaluation. In accordance with PEA guidance for the screening evaluation, the maximum chemical concentrations detected in soil were evaluated as potential exposure point concentrations (EPCs). The COCs and EPCs for soil are presented in Table 7.

Table 5 presents the list of VOCs detected in on-site soil-gas – all chemicals were included as COCs for the human health screening evaluation, except that the leak-test compound (1,1-DFA) was not included. In accordance with DTSC guidance, the maximum chemical concentrations detected in the Subject Property soil-gas were multiplied by an assumed attenuation factor of 0.03 to obtain the estimated indoor-air EPC. The COCs and EPCs for soil-gas are presented in Table 5.

8.3 Screening Levels

Except for lead and arsenic, which are discussed at the end of this subsection, the EPCs were compared to screening levels for residential soil and air in accordance with DTSC's Human Health Risk Assessment (HHRA) Note 3, dated June 2020 (revised May 2022). Different screening levels were used to evaluate carcinogenic (cancer causing) impacts and non-carcinogenic impacts (e.g., liver or kidney damage). Carcinogenic screening levels are typically based upon a predicted excess long-term cancer risk of 1.0E-06 (one in a million). Non-carcinogenic screening levels are

based upon maintaining the daily COC intake below the level at which deleterious health effects are considered possible. Most of the screening levels consisted of Regional Screening Levels (RSLs) developed by USEPA, except for a few more-conservative DTSC-recommended values. For TPH, the screening level developed by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) was used.

For carcinogenic COCs, the screening evaluation was performed by calculating the ratio of the EPC to the carcinogenic screening level in accordance with the following equation from the PEA Guidance Manual:

$$\frac{\text{Maximum concentration}}{\text{Screening Level}} \times 10^{-6} = \text{Cancer Risk}$$

Screening Level

For non-carcinogenic COCs, the screening evaluation was performed by calculating the ratio of the EPC to the non-carcinogenic screening level in accordance with the following equation from the PEA Guidance Manual:

$$\frac{\text{Maximum concentration}}{\text{Screening Level}} = \text{Hazard Quotient}$$

Screening Level

To evaluate potential cumulative impacts, the calculated cancer risks were summed and hazard quotients were summed for all COCs were added together to provide cumulative cancer risks and noncancer hazard indices (Tables 7).

The evaluation for lead used Worksheet 1 (Table 10) of the DTSC Lead Risk Assessment Spreadsheet (LeadSpread 9, 2022). Worksheet 1 is based on a residential land use scenario. The EPC for lead of 10.05 mg/kg was entered as input into the spreadsheet calculations.

8.4 Evaluation Results

Human health screening evaluation results, divided into carcinogenic and non-carcinogenic health effects, are discussed in the following two subsections.

8.4.1 Cancer Risks

As shown in Tables 7, two of the COCs are considered carcinogens by Cal/EPA (OEHHA) or USEPA (weight-of-evidence classification system: known [Group A], probable [Group B1 or B2], or possible [Group C] human carcinogen). Two of the COCs detected in soil vapor had an EPC that exceeded the selected carcinogenic screening level (Table 7). Two of the COCs detected in soil-gas had EPCs that exceeded the selected carcinogenic screening levels for exposure to air (Table 5). The estimated excess cancer risk for each COC was calculated by dividing the EPC by the screening level and multiplying by 1.0E-06 (the cancer risk level estimated by the screening level). The total cumulative calculated excess cancer risk for all COCs detected in soil vapor is 3.0E-04 (Table 7). The total cumulative calculated excess cancer risk for all COCs detected in soil vapor at 5-ft bgs is 1.4E-04, and at 10-ft bgs is 1.1E-04 (Table 7).

8.4.2 Non-Carcinogenic Health Effects

As shown in Table 7, two of the COCs had EPCs that exceeded the selected noncancer screening levels for exposure to soil vapor. As shown in Table 7, one of the COCs had an EPC that exceeded the selected noncancer screening level for exposure to air. The hazard quotient for each COC was calculated by dividing the EPC by the screening level. The hazard index was calculated by summing the hazard quotients for all COCs. The calculated hazard index for soil vapor is 8.5E+00 (Table 7). The calculated hazard index for air is 4.5E+00 based on COC detections in soil-gas at 5-ft bgs and is 3.5E+00 based on COC detections in soil-gas at 10-ft bgs (Table 7).

Based on the LeadSpread 9 output, the lead EPC in soil at the Subject Property is estimated to result in a 90th percentile increase in blood lead concentration of 0.5 micrograms per deciliter (µg/dL) in children which is lower than the benchmark level of concern of 1.0 µg/dL established by the Office of Environmental Health Hazard Assessment (OEHHA). Therefore, no further action in regard to lead concentrations in soil at the Subject Property. A copy of the LeadSpread 9 spreadsheet is provided in Table .

8.5 Discussion

Based on the results presented above, potentially significant health risks associated with the potential COCs detected at the Subject Property appear to be benzene and PCE in soil gas.

Arsenic and lead were evaluated separately from the other COCs. Arsenic is a naturally occurring element found in soil, water, air, and food as well as in many man-made products including pesticides, wood preservatives, paints, dyes, electrical components and medical drugs. Levels of naturally occurring arsenic in rocks and minerals differ widely across geographic regions, resulting in varying levels of arsenic in their soil and water erosion products. In addition to the naturally occurring arsenic, many soils are contaminated with anthropogenic sources of arsenic including arsenical pesticides, wood preservatives and mine tailings.

When arsenic in soil is evaluated using standard exposure intake assumptions, background soil arsenic levels almost always have an associated cancer risk far in excess of 1×10^{-6} . Evaluation in the risk assessment process and the development of clean-up goals for arsenic are conducted on a Site-by-Site basis and may include considerations of additional ambient data, bioavailability, and incremental risk. A background data set was compiled from Arden Middle School and Katherine Johnson Middle School data sets to establish a general background arsenic concentration from the 95% Upper Tolerance Limit (UTL) to establish the Upper Threshold Value (UTV) of 6.2 mg/kg. All samples were below the UTV of 6.2 mg/kg.

Exposure to lead is evaluated differently within the human health risk assessment from the excess cancer risk and health hazard index assessments. While lead may be removed from the list of COCs by comparison to background, in general, lead is almost always elevated on Subject Properties with historical uses of leaded gasoline and lead-based paints. Health risk from lead exposure is estimated using the Lead Risk Assessment Spreadsheet, termed LeadSpread 9. The most current version can be found at: <http://www.dtsc.ca.gov/AssessingRisk/leadspread9.cfm>.

For school evaluations, the home grown produce feature in the LeadSpread 9 is set to zero, assuming that home grown produce is not a significant contribution. Using default input values and a blood lead concentration for a non-pica child of 1 microgram per deciliter, the soil screening level for lead for school Subject Property is 80 mg/kg. Subject Property specific input requires the approval from DTSC. The DTSC Human Health Risk Assessment Notes should be consulted for updates.

Using the conservative assumed indoor-air attenuation factor of 0.03, one of the COCs have predicted indoor-air concentrations that exceed residential carcinogenic and noncancer screening levels (Table 7), benzene has an indoor air attenuation factor of 0.264 $\mu\text{g}/\text{m}^3$. However, the actual attenuation factor is expected to be lower than the assumed attenuation factor of 0.03 for the following reason. The assumed attenuation factor of 0.03 is based on a USEPA database of measured attenuation factors for primarily residential buildings [USEPA, 2012]. The actual expected attenuation factor for large modern classroom buildings that will be designed and constructed according to the strict standards required of publicly funded schools in California is less than 0.03, because such buildings are expected to have higher-quality floors less susceptible to vapor intrusion, higher indoor-air exchange rates, and higher ceilings.

8.6 Uncertainty Analysis

The human health screening evaluation required the use of several generic and Subject Property-specific assumptions regarding the representativeness of sampling data, environmental fate and transport, human exposures, chemical toxicity, and associated cancer and noncancer health risks. These assumptions are discussed below.

Factors possibly contributing to overestimation of the health risks include the following:

- The predicted risks and hazards are based on the maximum COC concentrations detected in the Subject Property soil and soil-gas samples that were collected during this PEA. Actual exposures for humans at the Subject Property would likely be at lower concentrations than the maximum most of the time.
- The evaluation assumed no degradation of COCs over time or space. As discussed above in Section 8.6, this assumption is likely particularly conservative for the benzene concentrations measured at a depth of 5-ft bgs, which likely diminish substantially at lesser depths due to aerobic biodegradation. In addition, concentrations of petroleum COCs are expected to attenuate over time due to various mechanisms of degradation, including biological degradation and volatilization.
- Numerous assumptions related to human exposure are built into the calculations used for the screening evaluation. These assumptions include such parameters as soil ingestion rates, potential dermal exposure to soil, dust generation rates, daily breathing rates, human activity patterns, and time spent on Subject Property. Each assumed value is typically chosen conservatively for a generic person.

Factors possibly contributing to underestimation of the health risks include the following:

- Sample locations were selected with the objective of finding elevated concentrations if present, but the possibility exists that other locations are present at the Subject

Property that have higher COC concentrations than the locations that were sampled, or that have other detectable chemicals that were not detected during this PEA.

- The screening evaluation assumed that risks resulting from simultaneous exposure to multiple COCs is additive. It is possible that simultaneous exposure to multiple chemicals may result in synergistic effects, where certain chemicals magnify the toxicity of other chemicals. There are few studies that have examined the cumulative effects of multiple chemical exposures.
- As discussed above most of the assumptions for the human health screening evaluation were conservative in nature. The use of conservative assumptions tends to produce upper-bound estimates of risk. Although it is exceedingly difficult to quantify the uncertainties associated with all the assumptions used, the multiplicative relationship of the series of assumptions involved in the screening evaluation may well create a substantial overestimate of health risks.

8.7 Conclusions

The results summarized above indicate that some on-site surficial soil vapor contains elevated concentrations of benzene and PCE exceeding residential screening levels.

A human health screening evaluation was performed in accordance with PEA guidance. For COCs detected in soil vapor, the cumulative calculated excess cancer risk was $3.0\text{E-}04$, which is less than $1.0\text{E-}06$ is therefore considered acceptable. The calculated hazard index is 18, which is greater than 1.0 and is therefore considered unacceptable. Using an assumed indoor-air attenuation factor of 0.03, the total cumulative calculated excess cancer risk for all COCs detected in soil gas at 5-ft below ground surface (bgs) was 4×10^{-04} , and at 10 ft bgs was 1.1×10^{-04} . The calculated hazard index for air was 4.5 based on COC detections in soil-gas at 5-ft bgs and was 3.5 based on COC detections in soil-gas at 10-ft bgs. Anticipated indoor air concentration was calculated by taking the maximum detected soil vapor concentration of $8.8 \mu\text{g}/\text{m}^3$ and multiplying it by the attenuation factor of 0.03 ($8.8 \times 0.03 = 0.264$), which exceeds the residential SL for indoor air, cancer endpoint of $0.097 \mu\text{g}/\text{m}^3$. The attenuation factor of 0.03 is considered conservative for two primary reasons: (a) large modern classroom buildings to be designed and constructed according to the strict standards required of publicly funded schools in California are expected to have lower attenuation factors than the residential buildings on which the assumed attenuation factor of 0.03 was primarily based, and (b) substantial bioattenuation of petroleum vapors is expected in the upper 5 ft of soil.

9 PUBLIC PARTICIPATION

Public notification of PEA activities was performed in accordance with California Education Code requirements and the guidance of DTSC.

9.1 PEA Work Notice

Prior to conducting the field sampling for the PEA, a work notice, notifying residents/businesses within view of the Subject Property of the upcoming sampling activities, was hand delivered to the nearby neighborhoods on April 6, 2023, pursuant to the requirements of California Education Code Section 17210.1(b). A copy of the PEA work notice is included in Appendix E.

9.2 Public Comment Period and Public Hearing

SJUSD provided a 30-day public comment period for the Draft PEA Report from April 18 through May 19, 2023, and held a public hearing on April 25, 2023, pursuant to the requirements of California Education Code Section 17213.1(a). Notice of the public comment period was published in a general circulation newspaper. During the public comment period, the Draft PEA Report was available for public review and comment at the following addresses:

San Juan Unified School District
3738 Walnut Avenue
Carmichael, California 95608

San Juan Unified School District
5320 Hemlock Street
Sacramento, California 95841

Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826

The Draft PEA Report also was available on the Internet at the DTSC “EnviroStor” database – see “Activities” tab at the following Internet address:

<http://www.envirostor.dtsc.ca.gov/public/profile>

Anyone interested in reviewing the Draft PEA Report, or providing comments, was instructed to contact Ms. Lisa Holcomb, DTSC Project Manager, by telephone at (916) 255-6523 or by electronic mail at lisa.holcomb@dtsc.ca.gov, or Mr. Nicholas Arps, SJUSD Director, Facilities, Construction & Modernization, by telephone at (919) 971-5780 or by electronic mail at Nicholas.arps@sanjuan.edu.

10 QA/QC PROGRAM

The QA/QC Program was implemented in accordance with the procedures set forth in Section 7.3 of the PEA Workplan.

Atlas Technical Consultants are responsible for implementing their own QA/QC program. This information is not in the current “*Limited Investigation Report and Addendum*” by Atlas.

Atlas states the sampling and reporting was conducted under generally accepted professional engineering and environmental consulting practices. Overall, the data is considered useable for decision-making purposes.

11 HEALTH AND SAFETY

During the PEA field activities, the site-specific Safe Work Plan (SWP) included in the PEA Workplan was followed to provide for the Subject Property worker health and safety. Atlas and TEG field personnel reviewed their own Health and Safety Plan prior to commencing field work. During field activities, appropriate “Level D” personal protective equipment was worn by all personnel. No conditions were encountered that required an upgrade above “Level D” personal protective equipment. No health and safety incidents or emergency actions occurred during the field program.

12 VARIANCES TO THE WORKPLAN

No variances to the PEA Workplan were required during implementation.

13 CONCLUSIONS AND RECOMMENDATIONS

The subsections below present the conclusions and recommendations for this PEA.

13.1 Summary and Conclusions

The subject property consists of one parcel of land that are designated as APN 268-029-000-10000 (9.75 acres). The subject property was an active adult center built in 1953 as an elementary school. The school consisted of gymnasium/multi-purpose room with stage, front office, library/media center, kitchen, classrooms, restrooms, utility rooms, server room, electrical rooms, breezeways, grass field, large, fenced vegetable garden, baseball field, basketball courts, four mobile trailers, and asphalt parking lots.

Historical documents indicate that the subject property has been developed since at least 1954 through present day as an elementary school, head-start program/pre-school, and adult learning center. The school added basketball courts, what appears to be tennis courts, baseball field, and parking lots between the 1950s until the 1970s. Prior to the 1950s the subject property was cleared fields that appear to be agricultural.

The PEA field investigation was performed in March and April 2023, conducted by Atlas and TEG under contract by SJUSD. Soil samples were collected at numerous locations and submitted to environmental laboratories for analysis of various COCs, such as metals like arsenic and lead, VOCs, OCPs, and PCBs that may be present in the Subject Property subsurface. Active soil-vapor samples were also collected at 5 ft and 10 ft dual nested soil vapor points at two locations on the Subject Property (SV-1 to SV-2) and submitted to an environmental laboratory for analysis of VOCs. Elevated concentrations of COCs were detected in some soil and both soil vapor samples. After discussions with the SJUSD and DTSC, follow-up soil vapor sampling was performed on April 7, 2023. The follow-up sampling included three additional soil vapor locations with samples collected from 5 ft and 10 ft bgs dual-nested vapor points at each location.

A human health screening evaluation was conducted using the laboratory analytical results. The maximum detected concentrations in the Subject Property soil were compared to residential soil screening levels established by DTSC, the SFRWQCB, and the USEPA. The maximum detected concentrations in the Subject Property soil-gas were multiplied by an assumed indoor-air attenuation factor of 0.03 and then compared to residential air screening levels.

The PEA findings are summarized as follows:

- Arsenic was detected in all discrete soil samples that were analyzed (Table 1). The maximum detected arsenic concentration in discrete soil samples was 5.0 mg/kg, which is significantly below background levels (Section 7.4.4). Elevated arsenic concentrations were limited to the native soil on cleared grassy fields to the north and west of the school structures. (Figure 2). A background data set was compiled from Arden Middle School and Katherine Johnson Middle School data sets to establish a general background arsenic concentration from the 95% UTL to establish the UTV of 6.2 mg/kg. All samples were below the UTV of 6.2 mg/kg.

- Lead was detected in all discrete soil samples that were analyzed (Table 1). The maximum detected lead concentration was 27 mg/kg, (Section 7.4.4). All lead detections were below the residential SL of 80 mg/kg.
- A PCB compound identified as PCB-1260 was detected at concentrations of 0.0027 J² mg/kg at KJMS-3, 0.0023 J mg/kg at KJMS-6, and 0.0086 J mg/kg at KJMS-11. These surface soil samples were collected near the southernmost classrooms and office buildings. The detected concentrations are well below the residential screening level of 0.24 mg/kg. No other PCBs were not detected in any other soil samples.
- Several OCPs were detected in one soil sample (KJMS-OP4) and its duplicate (Table 2). The following OCPs were detected: 4,4-DDD at a concentration of 0.00035 J mg/kg, 4,4,-DDE at a concentration of 0.0052 mg/kg, and 4,4-DDT at a concentration of 0.0082 mg/kg. All concentrations are well below their respective residential SLs of 1.9 mg/kg, 2.0 mg/kg, and 1.9 mg/kg.
- Various VOCs were detected in the active soil-gas samples (Table 5), including benzene and PCE. Benzene was detected in four out of five soil vapor samples. At 5 ft bgs, benzene concentrations ranged from 4.1 µg/m³ to 14 µg/m³. At 10 ft bgs, benzene concentrations ranged from 3.9 µg/m³ to 11 µg/m³. These detections exceed the residential SLs of 0.097 µg/m³ and the commercial SL of 0.42 µg/m³. Tetrachloroethene was detected in one soil vapor sample (SV-1d) from 10 ft bgs at a concentration of 19 µg/m³, which exceeds the residential SL of 0.46 µg/m³. No other VOCs detections exceeded the residential SLs.
- Two surface soil samples were collected at 0.5 ft bgs near the shed. Neither sample had detections of VOCs.
- A human health screening evaluation was performed in accordance with PEA guidance. For COCs detected in soil, the cumulative calculated excess cancer risk was 3.0E-04, which is less than 1.0E-06 and is therefore considered acceptable. The calculated hazard index is 18, which is greater than 1.0 and is therefore considered unacceptable. Using an assumed indoor-air attenuation factor of 0.03, the total cumulative calculated excess cancer risk for all COCs detected in soil gas at 5-ft bgs was 1.4x10⁻⁰⁴, and at 10 ft bgs was 1.1x10⁻⁰⁴. The calculated hazard index for air was 4.5 based on COC detections in soil-gas at 5-ft bgs and was 3.5 based on COC detections in soil-gas at 10-ft bgs. Anticipated indoor air concentration was calculated by taking the maximum detected soil vapor concentration of 8.8 µg/m³ and multiplying it by the attenuation factor of 0.03. When calculated (8.8 x 0.03 = 0.264), the resulting converted detection exceeds the residential SL for indoor air, cancer endpoint of 0.097 µg/m³. The attenuation factor of 0.03 is consistent DTSC's Supplemental Guidance: Screening and Evaluating Vapor Intrusion (2022, DTSC) and is considered conservative for two primary reasons: (a) large modern classroom buildings to be designed and constructed according to the strict standards required of publicly funded schools in California are expected to have lower attenuation factors than the residential buildings on which the assumed attenuation factor of 0.03 was primarily based, and (b) substantial bioattenuation of petroleum vapors is expected in the upper 5 ft of soil.

² The J Laboratory flag. Result is less than the RL but greater than or equal to the MDL and the concentration is an estimated value

13.2 Recommendations

Based on these findings, AECOM recommends that DTSC approve this PEA Report with a determination that further action is needed before school occupancy occurs. The further action should include preparation of a Supplemental Site Investigation (SSI) to address the impacted soil gas near the proposed school buildings.

14 LIMITATIONS

This report was prepared in accordance with the scope of services set forth in the written agreement signed by SJUSD and AECOM. No other services beyond those explicitly stated should be inferred or are implied. This report was prepared by AECOM for SJUSD in a manner consistent with the level of care and skill ordinarily exercised by professional engineers, geologists, and environmental scientists in the geographic area of the Subject Property at the time AECOM's services were provided. AECOM provides no other warranties, either express or implied, concerning the contents of this report, which was prepared under the technical direction of the AECOM staff whose signatures appear on the cover letter included with this report. This report is intended for use in its entirety. No excerpts may be taken to be representative of the findings of this assessment.

The conclusions presented in this report are professional opinions based solely on AECOM's review of available historical information, observations of the Subject Property, review of lithologic/chemical data from borings drilled at the Subject Property, and review of other readily available information, as referenced in this report. The conclusions presented herein are intended exclusively for the objective stated herein, at the Subject Property indicated, and for the project indicated. Subsurface investigations inherently involve some measure of uncertainty due to the impossibility of fully characterizing the entire subsurface volume beneath a Subject Property. Analytical results from this PEA are believed to be representative of the concentrations of those chemicals selected for analysis at the locations and depths from which the samples were collected. There may be other chemicals present in the samples that were not detectable using the selected analytical methods. In addition, these analytical results may not be representative of conditions at other locations and depths at the Subject Property. Conditions may change with the passage of time. The limited investigation sampling procedures, implementation, and data have been furnished to AECOM by SJUSD and was conducted by a third party (Atlas and TEG), which AECOM has used in preparing this report. AECOM has relied on this information as furnished and is neither responsible for nor has confirmed the accuracy of this information.

This report is intended for use solely by SJUSD. The scope of services performed during this investigation may not be appropriate for other users, and any use or re-use of this document, or the findings, conclusions, or recommendations presented herein, is at the sole risk of said users.

Opinions and recommendations presented in this report apply to Subject Property conditions and features as they existed at the time of AECOM's Subject Property visits. They do not necessarily apply to conditions or features of which AECOM is unaware and has not had the opportunity to evaluate.

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Figures

Tables

APPENDIX A

Limited Investigation Report and Addendum by Atlas Technical Consultants

A-1 Limited Investigation Report by Atlas

A-2 Limited Investigation Report Addendum by Atlas

Appendix A-1

Limited Investigation Report by Atlas

Appendix A-2

Limited Investigation Report Addendum by Atlas

APPENDIX B

Work Notice Letter dated April 5, 2023

APPENDIX C

Geologic Map and Background Data Set for Arsenic

